

Dep Col

THE UNIVERSITY OF MANITOBA

PARENT TRAINING AND HOME-BASED REINFORCEMENT  
IN THE TREATMENT OF CLASSROOM BEHAVIOR PROBLEMS:  
AN ASSESSMENT OF CHILD, TEACHER, AND PEER  
BEHAVIOR CHANGE

BY



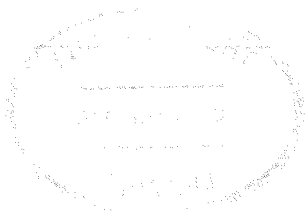
JOHN D. ECKELMAN

A DISSERTATION  
SUBMITTED TO THE FACULTY OF GRADUATE STUDIES  
IN PARTIAL FULFILLMENT OF THE REQUIREMENTS  
FOR THE DEGREE OF DOCTOR OF PHILOSOPHY

DEPARTMENT OF PSYCHOLOGY

WINNIPEG, MANITOBA

MAY, 1981



PARENT TRAINING AND HOME-BASED REINFORCEMENT  
IN THE TREATMENT OF CLASSROOM BEHAVIOR PROBLEMS:  
AN ASSESSMENT OF CHILD, TEACHER, AND PEER  
BEHAVIOR CHANGE

BY

JOHN D. ECKELMAN

A thesis submitted to the Faculty of Graduate Studies of  
the University of Manitoba in partial fulfillment of the requirements  
of the degree of

DOCTOR OF PHILOSOPHY

© 1981

Permission has been granted to the LIBRARY OF THE UNIVER-  
SITY OF MANITOBA to lend or sell copies of this thesis, to  
the NATIONAL LIBRARY OF CANADA to microfilm this  
thesis and to lend or sell copies of the film, and UNIVERSITY  
MICROFILMS to publish an abstract of this thesis.

The author reserves other publication rights, and neither the  
thesis nor extensive extracts from it may be printed or other-  
wise reproduced without the author's written permission.

### Abstract

This study evaluated the effects of a home report card program on child, teacher, and peer behavior in elementary classrooms. The parents of five disruptive, academically underachieving children were trained to administer a home-based reinforcement program. Daily teacher reports on target behaviors were used to determine home privileges and rewards. A variety of child, teacher, and peer behaviors were monitored in daily classroom observations throughout three program phases: baseline, teacher rating only, and teacher rating plus home reinforcement. Program onset was staggered in a multiple baseline design across subjects. The results indicated improvement in both targeted and nontargeted problem behaviors for three of the five children. There were no changes in the levels of social reinforcement provided by teachers or peers to the children who improved. Factors contributing to program success and strategies for maintaining classroom behavior change are discussed.

## ACKNOWLEDGEMENTS

I would like to express my thanks and appreciation to my friend and advisor, Dr. Bruce Tefft. His thoughtful criticisms, practical suggestions, and unfailing support contributed substantially to all phases of this project. I would also like to thank the members of my advisory committee, Dr. Dennis Dyck, Dr. Steven Holborn, and Dr. Derek Jehu, and my external examiner, Dr. Trevor Stokes. Their many suggestions have improved my research skills and have added to the quality of this piece of work.

Thanks are also due to Mr. Al Kircher of the Winnipeg Child Guidance Clinic for his assistance in obtaining referrals for the study. The cooperation of many principals and teachers in the St. Vital School Division is gratefully acknowledged. It is my hope that this research will contribute to the solution of the problems in education which these individuals grapple with on a daily basis.

My research assistants, Neil Cohen, Marlene Krenn, and Natalie Tarnawecky, worked long hours and made many personal accommodations in the service of this project, and their efforts are deeply appreciated. Without them, this study could not have been carried out.

Finally, my friend and colleague Katra Jensen deserves many thanks for typing the successive drafts of this manuscript and for listening patiently to my ruminations. I hope she never has to hear the words "multiple-baseline design" again.

This project was supported by a grant from the Manitoba Mental Health Research Foundation. The author wishes to thank the individuals associated with this agency for their encouragement and assistance.

## TABLE OF CONTENTS

ABSTRACT . . . . .	i
ACKNOWLEDGMENTS . . . . .	ii
TABLE OF CONTENTS . . . . .	iv
LIST OF TABLES . . . . .	vii
LIST OF FIGURES . . . . .	viii
LIST OF APENDICES . . . . .	ix
CHAPTER I: INTRODUCTION . . . . .	1
CHAPTER II: METHOD . . . . .	6
Subjects . . . . .	6
Measurement Procedures . . . . .	8
School Observation Data . . . . .	8
Teacher Report Data . . . . .	13
School Performance Data . . . . .	14
Parent Report Data . . . . .	14
Intervention Procedures . . . . .	15
Referral, Screening and Contracting . . . . .	15
The Parent Training Program . . . . .	16
Baseline . . . . .	19
Teacher Rating Phase . . . . .	19
Home Card Phase . . . . .	20
CHAPTER III: RESULTS . . . . .	23
Interobserver Reliability . . . . .	23
Data Analysis . . . . .	25
Subject 1: Ricky . . . . .	28
Subject 2: Michael . . . . .	37
Subject 3: Darren . . . . .	45
Subject 4: Robbie . . . . .	58
Subject 5: Bryan . . . . .	65
General Summary . . . . .	74

CHAPTER IV: DISCUSSION . . . . .	77
Response Classes . . . . .	81
Social Reinforcement . . . . .	85
Factors Influencing Report Card Effectiveness . . . . .	88
Conclusion . . . . .	92
CHAPTER V: LITERATURE REVIEW . . . . .	93
Introduction . . . . .	94
Parent Training Methodology . . . . .	97
Parent Training Dimensions . . . . .	98
Parent Selection . . . . .	99
Structure of Training . . . . .	99
Setting of Training . . . . .	100
Content of Training . . . . .	100
Producing Behavior Change in Nontraining	
Conditions: Basic Issues . . . . .	102
Generalization and Transfer . . . . .	103
Remote Contingency Control . . . . .	108
Maintenance of Behavior Change . . . . .	109
The Need to Program Generality and	
Maintenance of Behavior Change . . . . .	112
Strategies for Programming Extratraining	
Behavior Change and Maintenance in Parent	
Training Programs . . . . .	114
Contingencies of Reinforcement . . . . .	115
Sequential Intervention . . . . .	116
Remote Contingency Control . . . . .	117
Manipulation of Reinforcing Agents . . . . .	119
Stimulus Control . . . . .	121
Weakening Stimulus Control . . . . .	122
Programming Common Stimuli . . . . .	125
Response Characteristics . . . . .	128
Behavioral Trapping . . . . .	129
Modifying Response Classes . . . . .	131
Establishing Social Stimuli as	
Functional Reinforcers . . . . .	133
Schedules of Reinforcement . . . . .	135
Self-Management . . . . .	138

REFERENCE NOTES . . . . . 144

REFERENCES . . . . . 145

APPENDICES . . . . . 161



## List of Tables

Table 1	Characteristics of children and their families . . .	7
Table 2	Observation codes for child, teacher and peer behavior . . . . .	10
Table 3	Interobserver reliability coefficients averaged across sessions for each child . . . . .	24
Table 4	Ricky: Mean frequencies and standard deviations of school behavior categories . . . .	30
Table 5	Ricky: Teacher and parent report data . . . . .	35
Table 6	Michael: Mean frequencies and standard deviations of school behavior categories. . . .	39
Table 7	Michael: Teacher and parent report data. . . .	44
Table 8	Darren: Mean frequencies and standard deviations of school behavior categories . . . .	49
Table 9	Darren: Teacher and parent report data. . . .	55
Table 10	Robbie: Mean frequencies and standard deviations of school behavior categories. . . .	60
Table 11	Robbie: Teacher and parent report data . . . .	63
Table 12	Bryan: Mean frequencies and standard deviations of school behavior categories. . . .	67
Table 13	Bryan: Teacher and parent report data. . . . .	73
Table 14	Reinforced and nonreinforced behaviors showing improvement . . . . .	82

## List of Figures

Figure 1	Percent occurrence of Ricky's targeted behaviors and compliance . . . . .	31
Figure 2	Social attention received by Ricky . . . . .	33
Figure 3	Percent occurrence of Michael's targeted behaviors and opposition . . . . .	40
Figure 4	Social attention received by Michael . . . . .	42
Figure 5	Percent occurrence of Darren's targeted behaviors . . . . .	47
Figure 6	Percent occurrence of Darren's nontargeted problem behaviors . . . . .	51
Figure 7	Percent occurrence of Darren's social behaviors	52
Figure 8	Social attention received by Darren . . . . .	54
Figure 9	Percent occurrence of Robbie's targeted behaviors . . . . .	61
Figure 10	Social attention received by Robbie . . . . .	62
Figure 11	Percent occurrence of Bryan's targeted behaviors . . . . .	69
Figure 12	Percent occurrence of Bryan's nontargeted behaviors . . . . .	70
Figure 13	Social attention received by Bryan . . . . .	71
Figure 14	Selected target behaviors in experimental design . . . . .	75

### List of Appendices

Appendix A:	Observational Data Scoring Form . . . . .	161
Appendix B:	Classroom Adjustment Rating Scale (CARS) . . . . .	167
Appendix C:	Health Resources Inventory (HRI) . . . . .	169
Appendix D:	Louisville Behavior Checklist (LBCL) . . . . .	171
Appendix E:	Report Card . . . . .	176
Appendix F:	Summary Data for Ricky . . . . .	178
Appendix G:	Summary Data for Michael . . . . .	181
Appendix H:	Summary Data for Darren . . . . .	184
Appendix I:	Summary Data for Robbie . . . . .	187
Appendix J:	Summary Data for Bryan . . . . .	190

Children labeled by teachers as behavior or discipline problems can be found in most schools. These children present problems in the classroom because their disruptive behavior interferes with their own learning and with the schoolwork of other children. There is substantial evidence that programs utilizing school-based reinforcement contingencies can be successfully employed to reduce disruptive classroom behavior with such children (O'Leary & O'Leary, 1977), but these programs have serious limitations. The time and effort required to rearrange classroom contingencies is often great, and extensive teacher training may be necessary. Effective reinforcers may not be available in the classroom, and even when they are available teachers may be unwilling to alter their lesson plans in order to work with a single disruptive child. For these reasons it is desirable to develop behavior management programs for disruptive children which can be implemented and maintained outside the classroom. The home appears to be the most appropriate setting for such programs, since children's parents generally have potentially useful reinforcers at their disposal.

The feasibility of training parents as behavior managers has been demonstrated for a wide variety of child behavior problems occurring at home (Graziano, 1977; O'Dell, 1974). Most training programs described in the literature have provided parents with background knowledge of social learning principles and training in the use of such specific

procedures as differential praise, token reinforcement, and time-out. A considerable body of research evidence indicates that this training approach has been effective both in altering parenting behavior and in producing change in child behavior problems within the home (e.g., Patterson, 1974). However, home-based parent training programs have not proven effective in reducing child behavior problems in external settings, such as the school, where the parents cannot be present to provide consequences for appropriate and inappropriate behavior (Johnson, Bolstad & Lobitz, 1976; Miller & Sloane, 1976; Wahler, 1969b, 1975; Walker, Hops & Johnson, 1975). It appears that most child behavior problems are controlled by variables existing in specific settings, so that even similar problems at home and at school may be functionally independent (Wahler, 1975). Given these findings, it is unreasonable to expect that parents will be able to alter their child's school behavior problems simply by working on the same problems at home. In order to use parents as behavior managers for child school problems, it is necessary to develop a procedure for applying home-based reinforcement to the behaviors occurring in the school.

A number of investigators have used a daily report card completed by the teacher and sent home via the child to provide a connecting link between school behavior and a home-based reinforcement program (Atkeson & Forehand, 1979). In these studies, the parents have been instructed

to provide privileges and praise for teacher reports of appropriate behavior, and to suspend privileges following reports of misbehavior. This procedure has proven effective both in improving academic performance (Cohen, Keyworth, Kleiner & Libert, 1971; Hawkins, Sluyter & Smith, 1972; McKenzie, Clark, Wolf, Kothera & Benson, 1970; Karraker, 1972; Schumaker, Hovell & Sherman, 1977) and in reducing disruptive behavior in the classroom (Ayllon, Garber & Pisor, 1975; Bailey, Wolf & Phillips, 1970; Coleman, 1973; Schumaker et al., 1977). Report card programs have been successful with children from second grade to eighth grade in a variety of classroom situations.

These studies have shown that parents can be trained to use home-based reinforcement to alter child school behavior, but they have left several important questions unanswered. First, it is not clear whether these interventions had any effect upon academic and social child behaviors which were not specifically targeted for change. An assessment of the transfer of treatment effects to other responses should be a part of any applied intervention (Baer, Wolf & Risley, 1968). Second, these studies provided no data on the effects which the interventions may have upon the classroom behavior of the child's teacher and peers. There is some evidence that teachers may change their patterns of social attention to children following changes in child classroom behavior. Several investigators have noted increases in positive teacher attention and improvement

in teacher ratings following the reduction of disruptive acting out in the classroom (Craigie & Garcia, 1978; Sherman & Cormier, 1974). Similar changes in teacher attending have been observed in response to children who were trained to display appropriate interpersonal behaviors in class (Cantor & Gelfand, 1977; Graubard, Rosenberg & Miller, 1971). These findings are important because reactive changes in teacher behavior could result in a classroom environment which would maintain improved child behavior. Naturally occurring increases in teacher attention could provide long-term support for prosocial child behavior, and would obviate the need for extensive maintenance programming at school. Thus, it is of interest to know whether child behavior change resulting from a report card program is followed by changes in levels of teacher attention. Similarly, it is of interest to know whether child behavior change is accompanied by changes in the nature or amount of social attention provided by peers.

The present study was designed to provide a broad evaluation of the effects of a report card program upon the classroom behavior of elementary school children, their teachers, and their peers. Particular attention was focused upon the interactive effects of child and teacher behavior change. The study used a single-case experimental design with five subjects to examine the effects of two phases of a report card program. In the first phase, teachers rated targeted child behaviors

and provided the children with daily feedback on their performance; no reports were sent home to the parents. In the second phase, teacher ratings of child behavior were sent home daily, and the parents provided consequences for good or bad reports. Previous report card studies have shown that teacher rating alone produces negligible or short-lived behavior change (Hawkins et al., 1972; Karraker, 1972), and it was expected that the present study would replicate these results. The teacher rating only phase was included so that possible changes in teacher behavior resulting from observing and rating child behavior could be separated from teacher reactions to child behavior change produced by parental consequences. Changes in teacher behavior have been documented as a result of simply observing child behavior (Hay, Nelson & Hay, 1977), and such changes could prompt and perhaps maintain child behavior change at school without the implementation of a home-based reinforcement program. The present investigation collected data on a variety of child, teacher and peer behaviors in order to assess response generality and the possible occurrence of such reactive effects.



## Method

### Subjects

Subjects were five boys ranging from 5 to 9 years old who presented a variety of academic and conduct problems in school. The demographic characteristics of these children and their families are presented in Table 1. Subject referrals were solicited from principals and child guidance workers in a suburban elementary school division in Winnipeg, Manitoba. The criteria employed for subject selection were: (1) the child displayed serious behavior problems at school, but only mild to moderate problems at home; (2) neither the child nor the parents had been previously diagnosed as autistic, psychotic, brain damaged or retarded; (3) the parents, if together, did not experience serious marital discord or have plans for separation or divorce (single parents were accepted); and (4) the parents agreed to assume primary responsibility for maintaining a behavior management program under supervision in their homes for an 8 to 10 week period. Children who displayed serious behavior problems at home as well as at school were excluded because their parents would have required extensive training beyond the resources of this study. Parents experiencing severe marital conflict and parents or children previously diagnosed as psychotic or mentally retarded were excluded because such individuals have typically not benefitted from similar parent training programs (O'Dell, 1974;

**Table 1**  
**Characteristics of Children and their Families**

Referred child	Age	Grade	Adults at home	Mother's education level	Family income	Home problems reported	Identified school problems	Referral source
Ricky	8	2	Mother & stepfather	9th grade	\$20-30,000	yes	Noncompliance Attention seeking Interrupting Out of seat Poor schoolwork	Child Guidance Worker
Michael	5	K	Mother & boyfriend	9th grade	\$3-6,000	yes	Noncompliance Aggression Interrupting Apart from class	Child Guidance Worker
Darren	8	2	Mother	12th grade	\$10-14,000	no	Noncompliance Aggression Interrupting Out of seat Poor schoolwork	Child Guidance Worker
Robbie	9	4	Mother	12th grade	\$10-14,000	yes	Noncompliance Cursing Interrupting Nonattending Poor schoolwork	Child Guidance Worker
Bryan	6	1	Mother & father	12th grade	\$20-30,000	yes	Noncompliance Aggression Pestering peers Interrupting Poor schoolwork	School Principal

Patterson, Cobb & Ray, 1972). The above family characteristics were assessed by the experimenter in interviews with the referring agent, the family, and the teacher. Nine referrals were evaluated before five families meeting the above criteria were accepted.

#### Measurement Procedures

Four sources of data were used to evaluate child behavior change at school and at home.

School observation data. Behavioral observations were conducted for 30 minutes daily in the classroom of each child. Observations were scheduled regularly during periods in which the problem behaviors occurred. The observer was introduced as a visitor, and he/she did not interact with the class. The target child was not identified to the class, and the observer appeared to be observing the whole group. The total number of observation sessions ranged from 34 to 48.

The observers employed a modified version of the behavioral coding system developed by Wahler, House and Stambough (1976). This system utilizes an interval recording procedure in which behavior occurring within a 10 second observation interval is scored during a subsequent 5 second recording period. The modified coding system defined two classes of adult or child stimulus behavior (instructions and social attention) and three standard classes of child behavior (compliance, work, and social behavior). In addition, up to three specific problem

behaviors identified by the teacher were targeted for observation for each child (T1, T2, T3). Table 2 presents the names and scoring definitions for the 18 behavior codes which made up the classes described above.

The observers were prompted to observe and record by a pre-recorded cassette tape which they heard through a small ear monitor. The tape contained 120 15-second observe-record intervals, totalling 30 minutes of observation time. Occurrence of a behavior code was recorded on a grid scoring sheet (Appendix A) with a row for each interval. The frequency of occurrence of each behavior code was summarized as a percentage of the total number of scorable intervals in each session. Since summary scores for the behavior codes compliance and opposition provided only a measure of the total time spent in these activities, the variable noncompliance ratio (NC) was computed to reflect the percentage of compliance to teacher instructions. This ratio was obtained by dividing the number of instructions followed by compliance within two intervals by the total number of instructions (I+ and I-).

The observers in the study were three undergraduate honors students in psychology at the University of Manitoba. The observers were always assigned to the same children, with two of the observers each covering two children in consecutive sessions. The observers were contracted for a 10 week period, and were paid for their work.

Table 2

Observation Codes for Child, Teacher and Peer Behavior

---

SPECIFIC PROBLEM BEHAVIORS

T1	<u>Target Behaviors</u>	Unique behavior codes scored for occurrences of specific problem behaviors.
T2		
T3		

COMPLIANCE

C	<u>Compliance</u>	Scored for compliance to a teacher instruction. May be scored for successive intervals for an act of indefinite length.
O	<u>Opposition</u>	Scored for lack of compliance to a teacher instruction as long as the instruction is in effect.

WORK

SS	<u>Sustained Schoolwork</u>	Scored for active school-related behaviors and reading occurring for most of an interval.
SA	<u>Sustained Attending</u>	Scored for visual attending to school-related objects, people and activities.
SN	<u>Sustained Nonattending</u>	Scored for inattention or off-task behavior occurring when SS or SA is possible. <sup>a</sup>

SOCIAL BEHAVIOR

Aa	<u>Approach Adult</u>	Scored for spontaneous verbal or physical approach to an adult.
SIa	<u>Social Interaction - Adult</u>	Scored for interactions with an adult following approach by child or adult.
Ac	<u>Approach Child</u>	Scored for spontaneous verbal or physical approach to another child.
SIc	<u>Social Interaction - Child</u>	Scored for interactions with a child following approach by child or peer.

## INSTRUCTIONS

I+	<u>Instruction Nonaversive</u>	Scored for neutral commands or requests specifying desired behavior.
I-	<u>Instruction Aversive</u>	Scored for aversive <sup>b</sup> commands or requests specifying desired behavior.

## SOCIAL ATTENTION

SA+	<u>Adult Attention Nonaversive</u>	Scored for nonaversive physical or verbal contact with child by adult.
SA-	<u>Adult Attention Aversive</u>	Scored for aversive physical or verbal contact with child by adult.
SC+	<u>Child Attention Nonaversive</u>	Scored for nonaversive physical or verbal contact with child by another child.
SC-	<u>Child Attention Aversive</u>	Scored for aversive physical or verbal contact with child by another child.

---

<sup>a</sup> Percentage occurrence for SS, SA & SN was computed by dividing the total frequency of each code by the number of intervals in which school-related activities were possible. The sum of the SS, SA & SN percentages was thus always 100%. Because the relative frequency of SS and SA varied with the nature of the classroom activity, SN was usually used as the dependent variable when poor schoolwork was a targeted problem. SN directly reflected both SS and SA since it was always determined by their sum.

<sup>b</sup> An instruction or social interaction was judged "aversive" when: the content contained ridicule or a threat, voice tone was loud or threatening, or the interaction was accompanied by physical grabbing, pushing, striking, etc.

Before beginning in the classrooms, the observers received 15 hours of training in the use of the coding system. The training procedures followed those described by Wahler et al. (1976). Training included memorizing the behavior codes and scoring definitions, scoring and discussing a series of written classroom scenarios, and scoring videotapes of actual elementary classrooms. Training was conducted in a group format, and there was discussion of scoring rules and interpretations following each practice session. Observers were required to pass a written test on the scoring definitions with a score of 100% before beginning in the classrooms. The trainer accompanied each observer to the first classroom observation session, and together they resolved scoring problems unique to that setting.

The reliability of the observational data was assessed weekly for each child, with the trainer acting as the calibrating observer. Both observers scored a 30 minute period, using a special tape recorder jack which provided them with the same signals and thus ensured that scoring was synchronized. Average interval-by-interval agreement never fell below 80%, and no further training was required for any observer. This procedure did not control for observer reactivity during reliability checks, and it is possible that the reliability data overestimate true agreement. "Observer drift" (Reid, 1970) was minimized in the

study by having the same calibrating observer check reliability for each child. "Observer bias" was controlled by keeping the observers unaware of when different phases of the home and classroom intervention went into effect.

Teacher report data. In order to assess changes in teacher perceptions of the target children, all teachers were asked to complete a pair of child behavior rating scales at the beginning and end of the intervention. These measures are described below.

The Classroom Adjustment Rating Scale (CARS) consists of 41 behaviorally oriented items describing school adjustment problems (Appendix B). The CARS was developed for use in a secondary preventive program for the early detection and treatment of school adjustment (Cowen, Trost, Lorion, Dorr, Izzo & Isaacson, 1975), and was designed to be completed by the teacher. The CARS total score has a reliability index of .92, and it has been shown to discriminate children referred to mental health services for school problems from nonreferred children (Lorion, Cowen & Caldwell, 1975). Normative data are available for primary grade children in both of these populations. The factor structure of the CARS distinguishes three areas of school problems: "acting out," "shy/anxious" and "learning problems."

The Health Resources Inventory (HRI) consists of 54 behaviorally oriented items describing primary grade children's school-related



competencies (Appendix C). The HRI emphasizes the positive, adaptive aspects of a child's functioning, and was designed to complement the CARS (Gesten, 1976). The HRI contains five factors: "good student," "adaptive assertiveness," "peer sociability," "rule following" and "frustration tolerance." The test-retest reliability of the factor sum is .87. This summary score has been shown to discriminate between referred and nonreferred children, and also to discriminate competency levels within a nonreferred (normal) sample.

School performance data. Official report cards describing the academic performance, social adjustment and personal motivation of each child were obtained for the report period including the intervention and the two preceding periods.

Parent report data. In order to assess changes in parents' perceptions of their children as a result of the home program, parents were asked to complete the Louisville Behavior Checklist (LBCL) before and after the intervention. The LBCL (Appendix D) is a parent-rated checklist developed to describe child behavior occurring in the home (Miller, 1967). The LBCL consists of 163 statements describing deviant and prosocial behaviors in simple language. Three broad-band factors have been derived for the LBCL: "aggression," "inhibition" and "learning disabilities." In addition, a "total disability" score can be

derived which provides a general index of child pathology. Normative data are available for a population of disturbed boys (Miller, 1967) and for boys and girls in the general population (Miller, Hampe, Barrett & Noble, 1971). The test-retest reliability is high for both boys and girls on the "total disability" score (.89 and .87), and for the broad-band factors (Miller, Hampe, Barrett & Noble, 1972).

#### Intervention Procedures

Referral, screening, and contracting. After an initial referral by a principal or child guidance worker, the parents of the referred child were contacted by telephone. The reason for referral was explained to them, and a brief description of the program was provided. If the parents expressed interest, a screening meeting was arranged in which the experimenter explained the program and its requirements in more detail. Information about the child and family was obtained, and a decision was made concerning the family's eligibility. If the family met the criteria described above they were invited to participate in the program. All families who were invited to participate agreed to do so. During the remainder of the meeting, the experimenter collected demographic data on the family, and the mother completed the pretreatment LBCL on the referred child. The experimenter obtained the parents' written consent to request information from their child's teacher. The parents were left with a copy of

the parent training primer Living With Children (Patterson, 1976) and were asked to read the first section before the next meeting.

A meeting with the child's teacher was then arranged in which the experimenter explained the program, including the requirement of classroom observations, and asked the teacher if he/she wished to participate. All teachers agreed to do so, although one had initial reservations. Each teacher was asked to describe the child's problem behaviors in school, and up to three specific behaviors were targeted for observation. A classroom observation schedule was arranged for a time of the day when the problem behaviors occurred. Baseline observations began shortly afterwards.

The parent training program. Parents were trained in their homes in a five week core instructional program. Following training, the home card phase of the report card program was instituted. The parents were contacted by telephone for weekly progress reports through the remainder of the program. Additional home meetings were scheduled when parent reports or school observation data indicated that the home report card program was ineffective. The following is an outline of the five core instructional sessions. The content presented in the first three sessions followed the section headings in Patterson's Living With Children (1976).  
Session I. How Parents and Children Learn: Parents prepared for this meeting by working through the programmed text in Section 1 of

Living With Children (pp. 1 - 46). A definition of reinforcement was presented, and simple examples of reinforcement processes were discussed. A distinction between social and nonsocial reinforcers was made, and examples of each type were given. There was a discussion of how parents may inadvertently reinforce negative child behaviors, and thereby teach their children to act out.

Session II. Changing Undesirable Behavior: Parents read Section 2 (pp. 47 - 66) of the programmed text for this meeting. The basics of pinpointing, observing, and counting specific behaviors were discussed. Parents identified two problem behaviors and two prosocial behaviors and gave operational definitions of each. A simple point system was described and parents implemented it with the problem behaviors defined earlier. Parents were taught to use both praise and tangible rewards when providing consequences. All parents collected data on the child behaviors they were trying to change. These data were used by the parents to monitor their programs, but they were not used to evaluate the success of parent training procedures.

Session III. Techniques for Common Problems: Parents read Section 3 (pp. 67 - 92) for this meeting. The procedures of extinction and time out were described in detail. Modeling and role playing were used to teach parents how to administer a time out. Parents described common

behavior problems (e.g., noncompliance, pestering, acting out), and the use of positive reinforcement, extinction, and time out in dealing with these problems was discussed. The point system was reviewed and problems with it were discussed and corrected.

Session IV. Evaluation: All parents were given a written test on the application of social learning principles to family life. This 72-item fill-in-the-blank test was developed specifically for use with Living With Children (Patterson, 1976) by Patterson, Reid, Jones and Conger (1975, pp. 165 - 167). The test was scored and discussed during the meeting. Parents were required to pass the test with a score of at least 80% correct, and all parents met this criterion.

Session V. Planning the Report Card Program: This session focused on how parents would provide home-based reinforcement for daily school report cards. All of the parents were encouraged to use a combined point system and privilege restriction program in which children could earn both daily treats and points toward a major weekly reinforcer (e.g., a toy or activity) for good reports, but lost basic home privileges (e.g., TV time) if their reports fell below a certain level. Each behavior on the report card was rated on a 5-point scale (Appendix E), so it was possible for parents to directly convert ratings into points. Development of the home-based reinforcement program was done primarily

by the parents, with the experimenter acting as a consultant to help implement their ideas. The children were included in the planning process and had input into the selection of reinforcers and the specification of consequences. When program planning was completed after the fifth session, the training phase of the intervention was concluded.

Baseline. In order to demonstrate experimental control over behavior change, the study employed a multiple baseline design across subjects. Normal classroom conditions were maintained during baseline. Baseline observations began in the classroom after the initial teacher meeting, and continued while parent training was occurring in the home. All observations employed the 18-category behavior coding system described above. Observations were conducted at the same hour daily, with the number of baseline sessions ranging from 8 to 21. The length of the baseline phase increased systematically in increments of 2 to 6 days for the five subjects, as determined by the multiple baseline design.

Teacher rating phase. The teacher rating phase began for each subject when the required number of baseline observations was reached. At the beginning of this phase the experimenter and the teacher met to decide which of the identified problem behaviors would be targeted for change in the report card program. The criteria used for selection were: (1) the teacher continued to view the behavior as a problem, (2) the behavior had an adequate operational definition, and (3) the

behavior had occurred at least several times during most baseline observation sessions. One or two regularly occurring behaviors were selected for each child (e.g., doing schoolwork, aggression, interrupting). The teacher was instructed to begin rating each targeted behavior on the following 5-point scale: 5 = very good, 4 = good, 3 = average, 2 = poor, 1 = very poor. The scale was incorporated with the names of the target behaviors in a small report card (Appendix E). The report card ratings described the child's behavior during the morning or afternoon in which the observation session occurred. The teacher was instructed to show the report card ratings to the child at the end of this period and was asked not to provide contingent consequences or to send the card home. Parents were not informed of when the teacher rating phase would begin in order to avoid confounding teacher rating with home-based consequences. The teacher rating phase lasted from three to five days for each child.

Home card phase. After four to five days of providing feedback on classroom behavior, the teacher began to send the report card home with the child. Subjects entered the home card phase at staggered intervals determined by the multiple baseline design. The parent training program was timed so that the last planning session occurred the night before the home card phase began. The parents provided

rewards or suspended privileges for daily reports according to the contract developed with the child and experimenter. Special contingencies were established for occasions when the child "forgot" or "lost" the card: on these days the child earned no points and forfeited all basic privileges. Parents were asked to keep a daily record of teacher reports so that they could assess changes in child school behavior during the program.

During the first week of the home card phase the parents were contacted several times by telephone to check for problems and to provide encouragement. Weekly calls were made thereafter through the end of the program to monitor progress. Additional home visits were arranged with two families whose children were not improving at school (Ricky and Robbie), and several program alterations were made. These alterations included increasing the positive consequences provided for good reports and stiffening the privilege restriction imposed for poor reports. Parental implementation of the home program was monitored during the weekly calls and home visits by asking the parents and children separately if the specified consequences were provided. Everyone said yes except for Robbie's mother, who admitted that she was inconsistent in withdrawing privileges for poor report cards. The home card phase continued through the end of the school year



(about six weeks) for all children. School observations were discontinued after a total of 40 or more sessions. It was not possible to do a follow up assessment of program effectiveness because the school year ended and all children moved to different classrooms the next fall.

## Results

### Interobserver Reliability

From five to seven reliability checks were conducted for each child across the three phases of the research. Interobserver agreement was scored interval-by-interval for each behavior in each session. Reliability coefficients were then computed for each behavior using the following formula:

$$\frac{\text{Number of agreements on occurrence}}{\text{Number of agreements + disagreements on occurrence}} \times 100$$

The resulting coefficients were averaged across sessions for each child, yielding a summary reliability coefficient for each behavior category.

This agreement index is known as "occurrence reliability," and it is appropriate for observational data in which targeted behaviors occur at a low rate (Bijou, Peterson, & Ault, 1968; Kratochwill & Wetzel, 1977). This measure was chosen because most behaviors observed in the present study occurred at a frequency of 25% or less.

Table 3 presents the average interobserver reliability coefficient for each behavior of each child. The grand average across children is also presented for all behaviors except the targeted behaviors, which varied from child to child. The data show that observer agreement on behavioral occurrence ranged from 33% to 100%, with all but 8 coefficients falling within the 80-100% range. Agreement was poorest for several

Table 3

Interobserver Reliability Coefficients Averaged Across Sessions

# sessions	T1	T2	T3	C	O	SS	SA	SN	Aa	SIa	Ac	SIc	I+	I-	SA+	SA-	SC+	SC-	
Ricky	6	.88	.85	.53	.91	.92	.83	.88	.84	.85	.87	.78	.82	.89	1.0	.81	.94	.86	1.0
Michael	5	.81	.92	.90	.90	.93	<sup>a</sup> .90	.88	.97	.95	.87	.87	.94	1.0	.93	.96	.89	.92	
Darren	6	.94	.99	.75	.96	.91	.89	.76	.84	.83	.82	.74	.87	.94	<sup>a</sup> .86	.94	.86	.80	
Robbie	6	.33	.62	.92	.98	.97	.88	.89	.82	.94	.94	.81	.83	.96	<sup>a</sup> .94	<sup>a</sup> .81	<sup>a</sup> .81	<sup>a</sup> .81	
Bryan	7	.88	.96	<sup>a</sup> .81	.91	.90	.93	.87	.88	.86	.81	.85	.86	.89	1.0	.82	.73	.84	1.0
$\bar{X}$		<sup>b</sup> .88	<sup>b</sup> .85	<sup>b</sup> .53	.93	.93	.88	.86	.85	.89	.88	.84	.85	.92	1.0	.87	.89	.85	.93

<sup>a</sup> Reliability could not be computed for this behavior code because it was never scored.

<sup>b</sup> The target behaviors designated by T1, T2 and T3 were different for each child.

identified problem behaviors which were poorly defined and occurred infrequently; none of these behaviors was targeted for intervention. The agreement rates of 80-100% for all other behavior categories are excellent, particularly considering the complexity of the coding system. The level of agreement which would be expected by chance for a behavior occurring at a rate of 25% is about 8%; for a behavior occurring at a 50% rate, chance agreement would be about 30% (Kratochwill & Wetzel, 1977). The present results thus substantially exceed levels of agreement which would be expected by chance alone.

#### Data Analysis

The raw frequency data from the school observations were converted to percentage scores by dividing the total number of intervals in which a behavior was scored in each session by the number of intervals in which it could have been scored. This procedure controlled for variations in the number of scorable intervals in each session (range = 80-120, mean = 115) which resulted from temporary loss of sight of the subject. These percentage scores were used for all statistical analyses. It should be noted that these scores do not represent true frequency or duration, since multiple occurrences of a behavior during an interval were scored only once.

Following these computations, the percentage scores were plotted across time for all behavior codes. Time-series analyses were used to supplement

visual inspection in evaluating changes across experimental phases. The time-series procedure is appropriate for the analysis of behavioral data where serial dependency may be present (Jones, Vaught, & Weinrott, 1976; Jones, Weinrott & Vaught, 1978; Kazdin, 1976). Time-series analysis employs the linear regression model to test for differences in level and trend between experimental phases in a series of scores. The first phase of the analysis procedure computes autocorrelations and partial autocorrelations for different lags in the baseline series. The investigator uses these data to specify a model which describes the pattern of the baseline data (see Glass, Willson & Gottman, 1975, chapter 5). In the second phase, the model parameters are employed in a regression analysis to predict the future behavior of the dependent variable. Conventional t-tests for differences in level (y-intercept) and slope are then used to compare the predicted results with the observed results. All time-series analyses performed in the present study employed the computer program TMS developed by Bower, Padia & Glass (1974).

When the school observation data obtained in the study were submitted to the autocorrelation phase of the analysis, it was discovered that nearly all behaviors could be described by a "white noise" model in which autocorrelations were essentially zero. Since it is unusual for behavioral data to be serially independent, several checks of the analysis procedure were performed. These checks included plotting the data for different lags and visually

inspecting the scatterplots to determine the degree of correlation present. All checks confirmed the finding of no significant serial dependency in any series. The lack of serial dependency in these data is probably due both to high day-to-day variability and to the small number of baseline observations obtained (range=8-21). Glass et al. (1975) recommend 50 baseline observations for accurate model identification, but other investigators (Jones et al., 1977) have employed this procedure with between 3 and 34 observations. High day-to-day variability increases the number of observations required to accurately fit a model to the data. The consequences of model misidentification may be serious or trivial, depending upon the model parameter which is wrong (Padia, Note 1). Unfortunately, there is no way to determine what errors, if any, have been incorporated in the present analyses. Therefore, the results of these analyses must be regarded as tentative.

The analyses were performed using the zero-order differencing "white noise" model (0,0,0) described above. Under these conditions the time-series  $t$ -statistic is equivalent to an independent samples  $t$ -test between pre- and post-intervention means. When significant differences ( $\alpha < .05$ ) were found between the variances of adjacent phases, the  $t$ -statistic was recomputed using the separate sample variance estimate for the standard error of the difference and the appropriate correction in degrees of freedom (Hays, 1973, p. 410). It was decided to control Type II error rate at .05

for each behavior; therefore each comparison between phases (A-B or B-C) had to reach the probability level of  $.05/2 = .025$  to be deemed significant. Because Type II error rate was not controlled per experiment (i.e., per child) by this procedure, caution must be exercised in interpreting the results of individual significance tests. As a rule, significant findings were interpreted only when the overall pattern of results indicated a clear intervention effect.

The intercorrelations of the observed behaviors and the results of the time-series analyses are presented for each child in Appendices F through J. The observational data are presented graphically and are tabled in summary form in the following sections. Because of the large number of behaviors observed on each child, only those behaviors which showed significant change or which were predicted to show change have been graphed.

Subject 1: Ricky

Ricky was initially referred for disruptive and noncompliant behavior in the classroom. At the time of referral his teacher described him as "manipulative," "attention-seeking," "unable to sit still" and "not working in class." During the first meeting with his teacher three behaviors were targeted for observation (in addition to those already included in the coding system): arguing, out of seat and interrupting. After eight baseline observation sessions a second meeting with the teacher was held, in which it was decided that the behaviors out of seat and schoolwork/attending

would be targeted in the report card program. These behaviors were chosen because they were occurring at a relatively stable and high rate during baseline. On the ninth observation day the teacher began to complete the report card and show it to Ricky; on the twelfth day Ricky began to take the card home. The total length of the program for Ricky was two months (39 observation sessions).

Correlations between teacher ratings and observational data.

Correlational analyses (presented in Appendix F<sub>1</sub>) revealed a moderate correspondence between teacher ratings and school observations for the targeted behaviors out of seat ( $r = .63$ ,  $p = < .01$ ), schoolwork ( $r = .51$ ,  $p = < .01$ ), and nonattending ( $r = .36$ ,  $p = < .02$ ). This indicates that Ricky's report cards provided a fairly accurate daily record of his school performance to his parents.

School observational data. The means and standard deviations of Ricky's observed school behaviors are presented in Table 4. Time-series analyses are presented in Appendix F<sub>2</sub>. The observational data for the behaviors targeted in the report card program are presented graphically in Figure 1. The behavior category nonattending is presented here instead of schoolwork and attending because it is inversely proportional to their sum and it is less sensitive to day-to-day changes in classroom activity (see footnote, p. 11). Figure 1 shows that Ricky's time out of seat decreased during the teacher rating phase, and remained at a lower mean level despite considerable day-to-day variation. The final target behavior, nonattending, did not change during the teacher rating phase, but did decrease shortly



Table 4  
**Ricky:** Mean Frequencies and Standard Deviations  
of School Behavior Categories

Behavior Category	Mean Frequency (%)			Standard Deviation		
	<u>A</u>	<u>B</u>	<u>C</u>	<u>A</u>	<u>B</u>	<u>C</u>
T1: Out of seat*	17.01	9.17	9.44	6.7	10.5	9.6
T2: Arguing	0.00	1.47	0.28	0.0	2.0	1.4
T3: Interrupting	3.41	0.82	0.80	3.8	0.7	1.3
Compliance	20.54	8.52	16.53	27.0	7.6	15.6
Opposition	14.93	38.97	20.43	12.7	41.7	19.7
Noncompliance ratio	39.71	37.25	39.53	44.3	42.8	39.5
Schoolwork*	37.52	24.72	41.13	24.4	32.4	23.9
Attending*	9.81	21.52	14.27	11.4	39.9	21.7
Nonattending	52.63	53.72	44.53	32.9	40.2	21.9
Approach to adult	6.68	7.07	5.94	3.3	7.5	4.6
Interact adult	8.07	7.30	9.54	3.2	5.1	7.7
Approach to child	7.13	4.15	4.95	4.3	2.3	3.3
Interact child	10.12	10.20	15.62	7.1	4.8	18.7
Instruction +	2.25	2.27	1.73	2.1	1.6	1.1
Instruction -	00.24	0.20	0.12	0.4	0.4	0.4
Adult attention +	11.21	6.03	13.75	4.0	8.3	9.4
Adult attention -	1.93	3.12	1.54	2.5	3.8	2.6
Child attention +	14.51	13.92	19.01	9.3	4.2	18.8
Child attention -	0.10	0.20	0.09	0.3	0.4	0.3

**Note:** A = baseline, B = Teacher rating, C = Home card  
\* Behaviors targeted with report card.

# RICKY

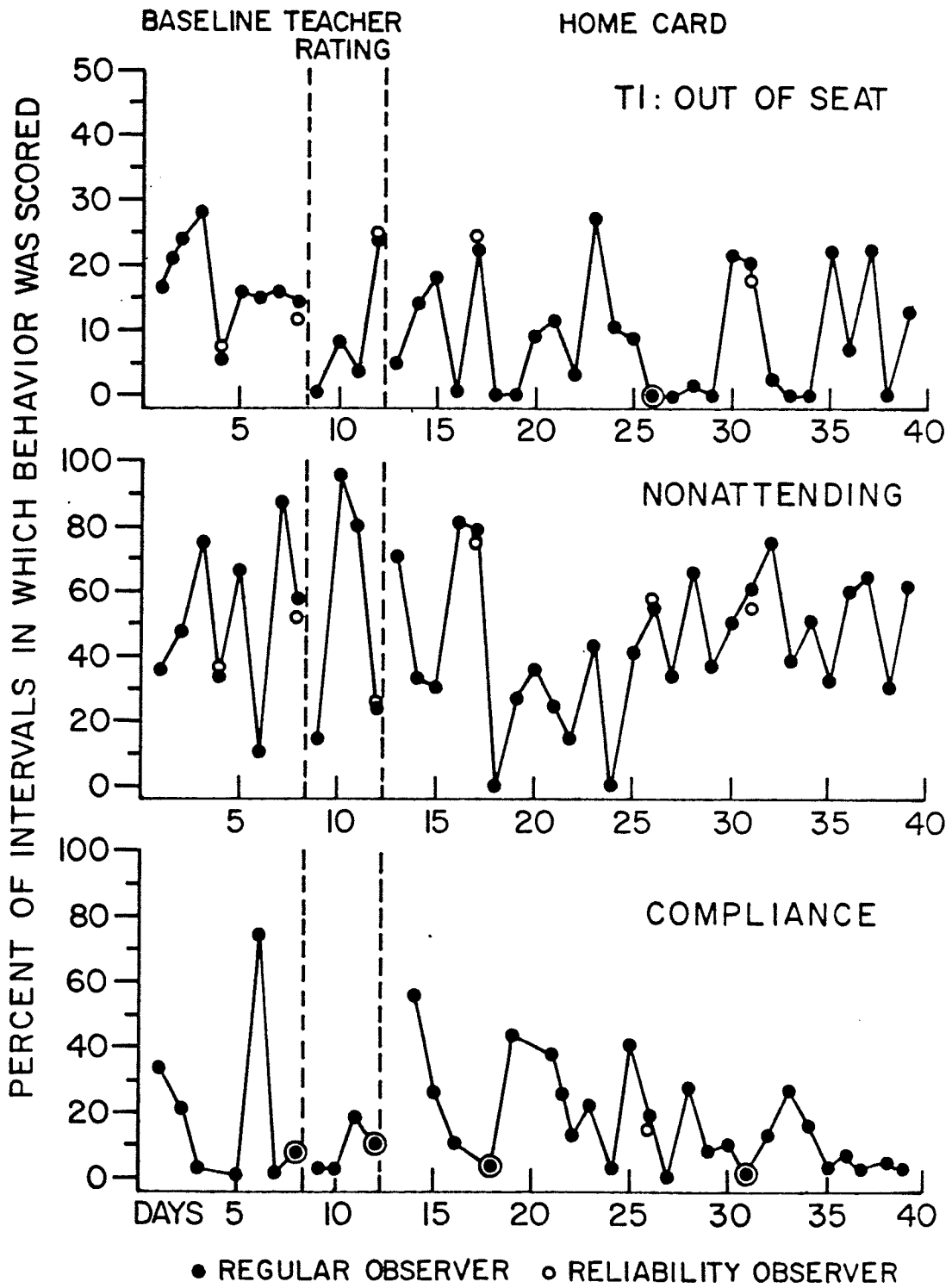


FIGURE 1: PERCENT OCCURRENCE OF RICKY'S TARGETED BEHAVIORS AND COMPLIANCE.

after the home report card was instituted; however, this decrease was not maintained. None of these changes in the targeted behaviors were found to be significant in the time-series analyses.

Few changes were observed in the nontargeted school behaviors. Ricky's compliance (also graphed in Figure 1) did show an initial increase at the beginning of the home card phase, but gradually decreased to baseline levels. None of Ricky's other behavior appeared to change during either phase of the intervention. Time-series analyses supported these conclusions: no significant differences in level between adjacent phases were found for any nontargeted behaviors. Despite several modifications of the reinforcement contingencies provided by his parents, Ricky's school behavior was not substantially improved by the report card program.

A secondary hypotheses of this research predicted that the nature and amount of social attention provided to a target child by his teacher and peers would change as his behavior changed during the program. Since Ricky's problem behaviors did not change substantially, the intervention with him does not provide an adequate test of this hypothesis. Figure 2 presents the observational data on four classes of social attention provided to Ricky by his teacher and peers. As the graphs suggest, there were no significant changes in the frequency of any class of attention (Appendix F<sub>2</sub>). The decrease in nonaversive adult attention

# RICKY

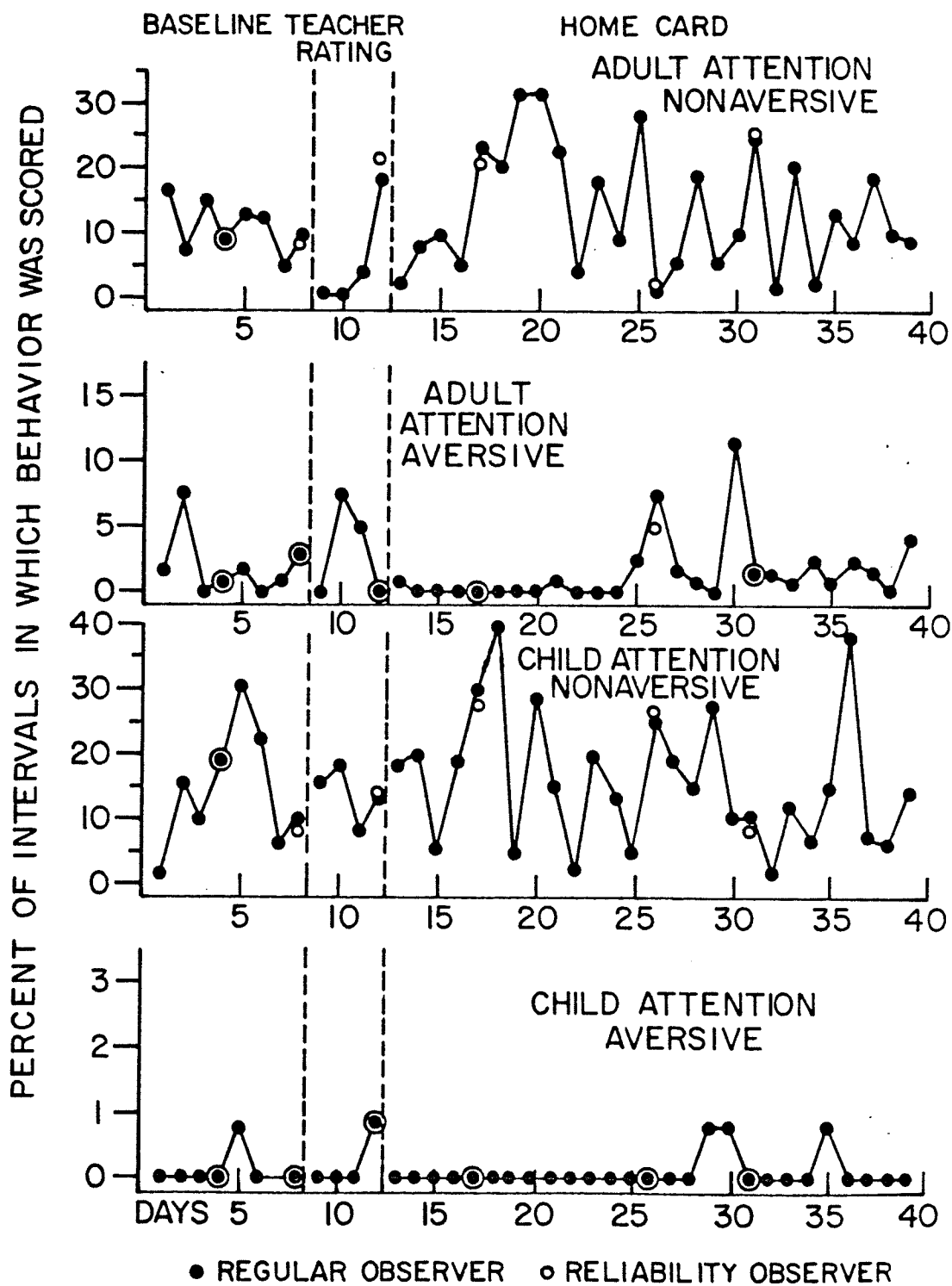


FIGURE 2: SOCIAL ATTENTION RECEIVED BY RICKY.

during the teacher rating phase approaches significance but this change reversed and was probably an artifact of the small number of observations in this phase.

Teacher and parent report data. Ricky's teacher rated his behavior at the beginning and end of the program on both the classroom Adjustment Rating Scale (CARS) and the Health Resources Inventory (HRI). These data are presented in the lower portion of Table 5. At pretest time Ricky was rated high (deviant) on all factors of the CARS. On three of these factors, Acting Out, Learning Problems, and the CARS Total, his score was two standard deviations greater than the normative mean. His Acting Out score decreased significantly (by 2 standard deviations) from pretest to posttest, but the other scores remained basically unchanged. On the HRI Ricky was well within the normative range on all factors at both pretest and posttest. His scores on the Peer Sociability and Rules factors increased by two standard deviations in the prosocial direction from pretest to posttest. It thus appears that Ricky's teacher viewed him as having serious classroom adjustment problems at the beginning of the program, and that she felt his acting out and peer relations had improved somewhat by the end of the program.

Additional information regarding Ricky's performance in school was obtained from his official report cards. These were completed three times during the year, with the second card immediately preceding the

Table 5  
Ricky: Teacher and Parent Report Data

Scales	Population Norms		Pre		Post	
	X	S.D.	Raw	%tile	Raw	%tile
<b>LOUISVILLE BEHAVIOR CHECKLIST (parent)</b>						
Infantile aggression	2.96	3.96	6	85	6	85
Hyperactivity	3.25	2.95	8	93	8	93
Antisocial behavior	0.74	1.24	0	60	2*	93
Aggression	6.08	6.22	10	82	13	90
Social withdrawal	2.79	3.04	7	90	5	89
Sensitivity	2.37	2.27	5	90	6	93
Fear	1.86	2.04	4	90	5	92
Inhibition	6.72	5.93	16	94	13	88
Academic disability	2.89	3.16	8	95	8	95
Immaturity	1.21	1.81	7	98	6	96
Learning disability	3.99	4.31	15	97	14*	96
Normal irritability	5.46	3.17	12	98	6	68
Severity level	14.03	12.91	26	88	26	88
<b>CLASSROOM ADJUSTMENT RATING SCALE (teacher)</b>						
Acting out	13.41	7.59	35		20**	
Shy/anxious	18.51	7.08	24		28	
Learning problems	22.71	10.58	47		46	
Total	62.32	20.28	117		104	
<b>HEALTH RESOURCES INVENTORY (teacher)</b>						
Good student	2.28	0.95	2.67		2.19	
Adaptive assertiveness	3.14	0.97	3.03		2.96	
Peer sociability	4.32	0.97	3.94		5.78*	
Rules	2.97	1.06	2.11		3.38*	
Frustration tolerance	2.52	1.05	2.29		3.10	
Factor sum	15.24	3.60	14.04		17.41	

\* Change of at least one standard deviation from pretest.

\*\* Change of at least two standard deviations from pretest.

intervention and the third card following it. These reports indicated that Ricky did not pay attention in class and had poor work habits throughout the year. Both pre-intervention reports described his behavior as disruptive and off-task, while the post-intervention report indicated that the amount of time he spent out of his seat was somewhat reduced. These reports are consistent with both the teacher report data and the classroom observation data.

Ricky's mother completed the Louisville Behavior Checklist (LBCL) on Ricky at the time of the first meeting and again at the end of the program. The factor scores derived from her ratings are presented at the top of Table 5. The data show that at the pretest time Ricky was rated high in the deviant direction on all scales of the LBCL. His scores on the Immaturity, Learning Disability, and Normal Irritability scales were more than two standard deviations above the normative means for those scales. With the exception of Normal Irritability, none of the LBCL factor scores decreased substantially from pretest to posttest. His score on the Antisocial Behavior scale increased by one standard deviation. Thus, according to Ricky's mother, his behavior at home was not improved by the intervention.

Summary. No substantial improvement in Ricky's school behavior was observed. There was initial positive change in the targeted behaviors during the homecard phase, but this was not maintained. No changes

in patterns of teacher of peer attention were noted. Teacher and parent ratings indicated that Ricky remained a problem at school and at home. Ricky's family was offered referral for more intensive treatment at the end of the program.

Subject 2: Michael

Michael was referred by his teacher because of problems with disruptiveness and noncompliance in his kindergarten classroom. She described him at the time as "an angry little boy who wants his own way," and stated that he was often verbally and physically abusive to herself and to the other children. His mother had recently been divorced, and his teacher felt that he lacked discipline at home. His mother confirmed this, stating that she was unable to manage his noncompliance and acting out. In consultation with the teacher, three school behaviors were targeted for observation: interrupting, being apart from the class, and aggression. (The term "aggression", as used here and elsewhere, was operationally defined as "physical contact with another person which produced a negative response.") After 10 baseline observation sessions, the behaviors apart from class and aggression were chosen as target behaviors because of their stability and high frequency. Michael received feedback from his teacher on these behaviors for four days before he began to take the report card home. The total length of the program for Michael was two months (34 observation sessions).

Correlation between teacher ratings and observational data.

The correlation between the teacher's report card ratings and the observational data was moderate for the behavior apart from class



( $r = .55$ ,  $p = .004$ ) and negligible for aggression ( $r = .02$ ,  $p = .466$ ) (see Appendix G<sub>1</sub>). This indicates that teacher ratings of aggression did not accurately reflect Michael's aggressive behavior. Home reinforcement for reported decreases in aggression would therefore not be expected to produce any real change in the level of this behavior.

School observation data. The means and standard deviations of the percentages of occurrence of Michael's school behaviors are presented in Table 6. Time-series analyses performed on these data are reported in Appendix G<sub>2</sub>.

The observational data for the targeted behaviors apart from class and aggression are graphed in Figure 3. The data show a steady decrease in the proportion of time Michael spent apart from class across the three experimental phases. However, it is apparent that this decreasing trend began during baseline, and it is therefore difficult to attribute it with confidence to the report card program. Since both the level and the variability of apart from class were decreased substantially during the home card phase, it seems likely that home contingencies had some effect upon this behavior. As expected, there was no evidence of change in levels of Michael's aggression as a result of the intervention. None of the time-series analyses performed upon either behavior showed significant results (see Appendix G<sub>2</sub>).

Table 6  
 Michael: Mean Frequencies and Standard Deviations  
 of School Behavior Categories

Behavior Category	Mean Frequency (%)			Standard Deviation		
	<u>A</u>	<u>B</u>	<u>C</u>	<u>A</u>	<u>B</u>	<u>C</u>
T1: Interrupting	4.66	5.65 <sup>3</sup>	4.56	3.3	4.1	2.4
T2: Apart from class*	39.44	22.67	16.49	26.1	22.5	16.9
T3: Aggression*	4.29	7.15	5.29	3.3	3.1	3.3
Compliance	13.91	12.55	13.25	20.0	7.7	9.4
Opposition	23.75	33.80	11.46	21.4	24.3	9.8
Noncompliance ratio	50.30	28.50	27.50	17.1	24.5	18.4
Schoolwork	0.00	0.00	0.00	0.0	0.0	0.0
Attending	52.96	36.07	50.90	28.7	37.7	21.2
Nonattending	37.04	63.90	46.18	25.4	37.6	20.0
Approach to adult	4.59	3.77	6.69	2.5	3.0	3.4
Interact adult	6.36	3.12	6.31	13.1	2.2	2.7
Approach to child	11.99	17.20	10.34	6.5	3.3	4.9
Interact child	17.12	36.12	37.16	13.9	17.8	16.3
Instruction +	4.59	5.02	4.80	2.6	2.7	1.8
Instruction -	0.40	00.82	2.30	0.5	1.2	1.7
Adult attention +	3.92	4.40	5.78	2.5	3.3	3.2
Adult attention -	1.72	3.35	4.70	1.7	2.7	2.8
Child attention +	20.67	44.90	38.73	16.4	16.0	11.7
Child attention -	1.87	3.78	5.75	2.0	2.7	3.4

Note: A = baseline, B = Teacher rating, C = Home card  
 \* Behaviors targeted with report card.

# MICHAEL

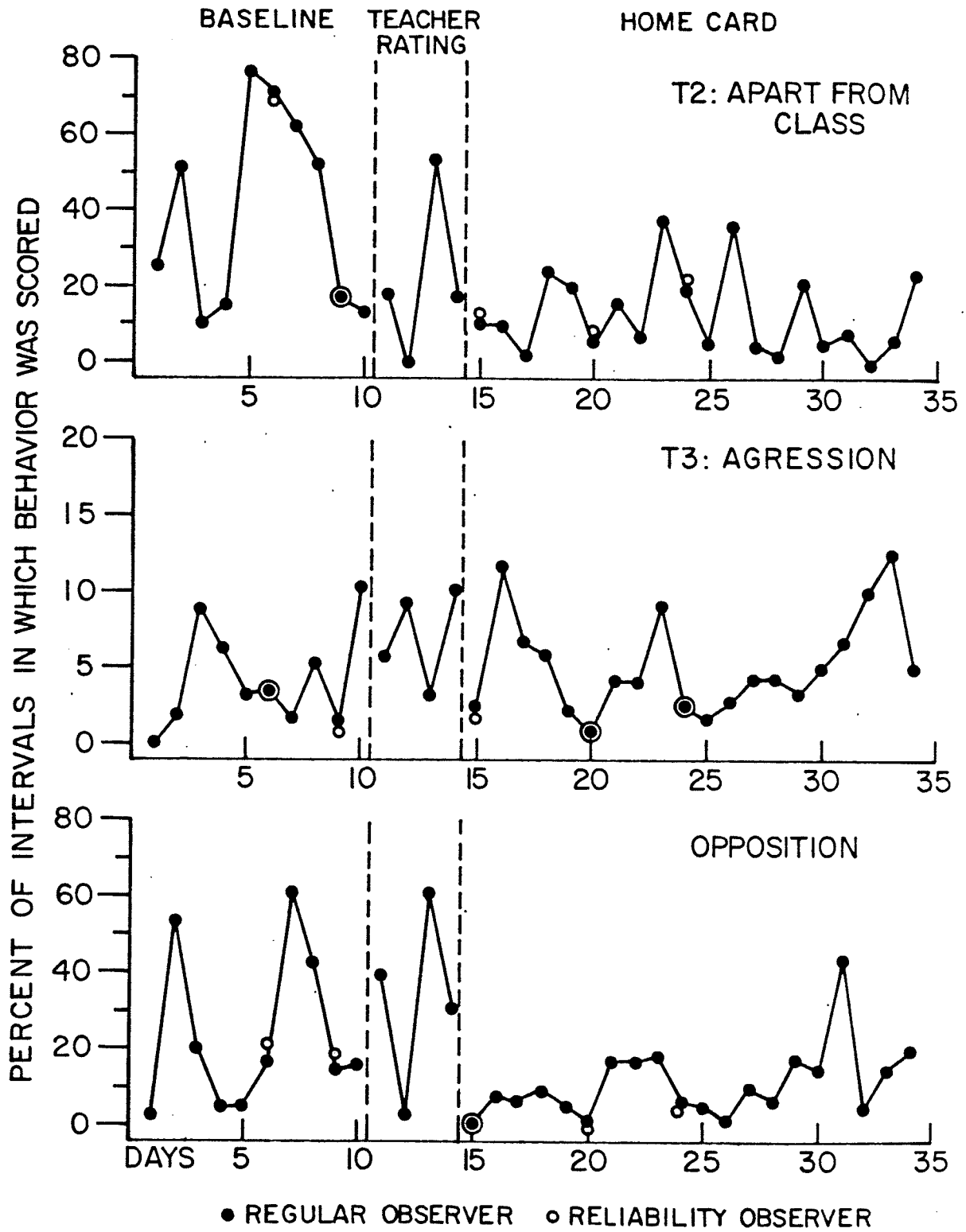


FIGURE 3: PERCENT OCCURRENCE OF MICHAEL'S TARGETED BEHAVIORS AND OPPOSITION.

The report card program had an indirect effect upon the nontargeted behaviors opposition and compliance. Figure 3 shows that the proportion of time Michael spent engaging in oppositional activities decreased abruptly when the report card began to be sent home. Correlational analyses (Appendix G<sub>1</sub>) showed that there was a strong positive relationship between opposition and apart from class ( $r = .58, p .001$ ). These findings suggest that Michael was able to improve his cooperation and participation in classroom activities as he spent more time in proximity to his peers and teacher. None of the time-series analyses performed upon the nontargeted behaviors showed significant results.

The nature and amount of social attention Michael received from his teacher and peers did not change during the intervention (Figure 4), despite the fact that he increased the time spent with his class and decreased his oppositional behavior. The only type of social attention which showed any change in mean frequency was child attention nonaversive, and it is apparent from Figure 4 that this increase occurred during the baseline period. It appears that the increase in child attention nonaversive was not directly related to the decrease in apart from class, since the correlation between these variables, while in the proper direction, was low ( $r = -.23, p .10$ ). The time-series analyses indicated no significant treatment effects for any type of attention provided by teacher or peers.



# MICHAEL

BASELINE

TEACHER RATING

HOME CARD

42

PERCENT OF INTERVALS IN WHICH BEHAVIOR WAS SCORED

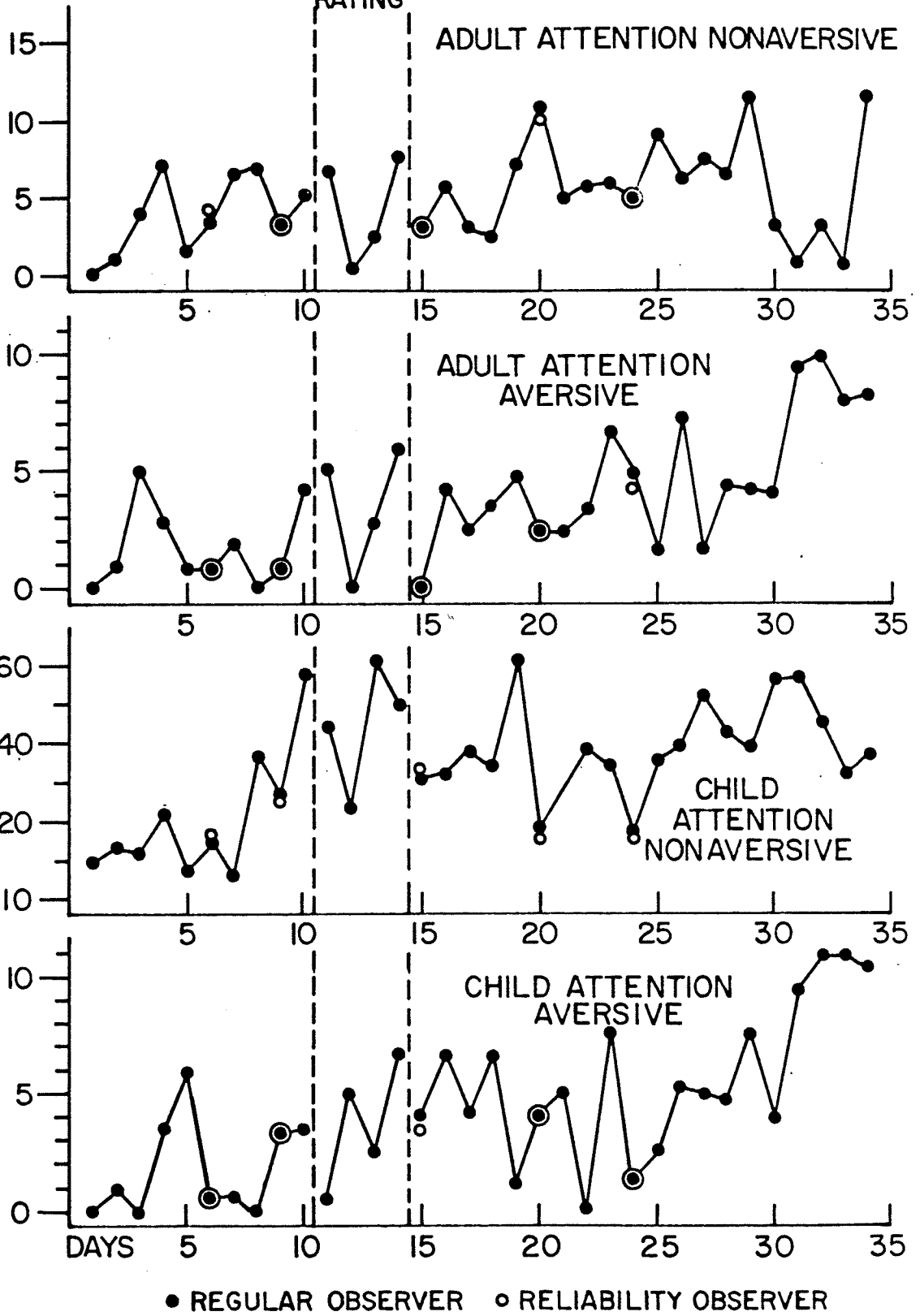


FIGURE 4: SOCIAL ATTENTION RECEIVED BY MICHAEL.

Teacher and parent report data. Michael's teacher rated his behavior at the beginning and end of the program on both the CARS and the HRI. These data are presented in Table 7. Michael was rated as being somewhat deviant on the Acting Out factor at pretest time, and was within the normal range on all other factors. At posttest, he was rated as more deviant on the Acting Out factor, while the other factor scores remained essentially unchanged. His ratings on the HRI were all within normal limits, and they did not change from pretest to posttest. It thus appears that Michael's teacher did not view him as having significant school problems other than acting out, and that she felt this problem area was not improved by the intervention. These ratings are consistent with the finding that Michael's aggression in the classroom was not reduced by the report card program.

Michael's mother completed the LBCL on Michael at the first meeting and at the end of the program. The factor scores derived from those ratings are presented at the top of Table 7. Before the program began, Michael was rated as highly deviant on all the scales of the LBCL. His scores on the Infantile Aggression, Hyperactivity, Antisocial Behavior, Aggression, Sensitivity, Fear, and Severity Level scales were all above the 95th percentile of the norms for those scales. At the end of the program, Michael was rated more positively on 12 of the 13 scales of the LBCL. His factor scores on all of the extremely deviant pretest scales decreased by

Table 7  
Michael: Teacher and Parent Report Data

Scales	Population Norms		Pre		Post	
	X	S.D.	Raw	%tile	Raw	%tile
LOUISVILLE BEHAVIOR CHECKLIST (parent)						
Infantile aggression	2.96	3.96	16	98	10*	95
Hyperactivity	3.25	2.95	11	98	7*	89
Antisocial behavior	0.74	1.24	5	98	3*	96
Aggression	6.08	6.22	26	97	15*	91
Social withdrawal	2.79	3.04	1	41	1	41
Sensitivity	2.37	2.27	7	96	4*	85
Fear	1.86	2.04	8	99	3**	80
Inhibition	6.72	5.93	14	92	7*	66
Academic disability	2.89	3.16	6	82	2*	56
Immaturity	1.21	1.81	3	91	2	84
Learning disability	3.99	4.31	9	89	4*	64
Normal irritability	5.46	3.17	8	82	5	58
Severity level	14.03	12.91	39	96	25*	86
CLASSROOM ADJUSTMENT RATING SCALE (teacher)						
Acting out	13.41	7.59	18		23	
Shy/anxious	18.51	7.08	12		12	
Learning problems	22.71	10.58	17		19	
Total	62.32	20.28	53		57	
HEALTH RESOURCES INVENTORY (teacher)						
Good student	2.28	0.95	3.57		3.87	
Adaptive assertiveness	3.14	0.97	3.61		4.36	
Peer sociability	4.32	0.97	4.68		4.95	
Rules	2.97	1.06	2.74		2.12	
Frustration tolerance	2.52	1.05	3.47		3.87	
Factor sum	15.24	3.60	18.07		19.17	

\* Change of at least one standard deviation from pretest.

\*\* Change of at least two standard deviations from pretest.

at least one standard deviation at posttest. The scales which still remained somewhat elevated at the end of the program were: Infantile Aggression, Hyperactivity, Antisocial Behavior, and Aggression. Thus, Michael's mother reported overall improvement in Michael's home behavior following the program, although acting out and aggressive behaviors continued to be unusually frequent. She reported verbally that Michael was much easier to manage at home.

Summary. The report card program used with Michael may be viewed as a limited success. Parental consequences were effective in reducing a targeted school problem behavior (apart from class) for which teacher ratings were accurate. In addition, levels of oppositional and noncompliant behavior in the classroom were somewhat reduced. No change occurred in another target behavior for which teacher ratings were inaccurate. Michael's teacher and peers did not alter their patterns of attending to him when his behavior changed. His mother reported general improvement in his home behavior following the program, but his teacher rated Michael's acting out problems in school as slightly worsened. Michael was referred to his school's counselling staff at the end of the program for continued treatment.

### Subject 3: Darren

Darren was referred by his teacher and principal because of aggression, noncompliance, and acting out in his second grade



classroom. At the time of referral, Darren was known as one of the most disruptive boys in his school. The problem behaviors identified by his teacher included: interrupting/talking out, bullying other children, being constantly out of his seat, not completing class work, and noncompliance. All of these behaviors were targeted for initial observation. After 12 days of baseline observation, the experimenter and the teacher met together and selected the behaviors out of seat and schoolwork as targets for the report card program. Darren's teacher showed him her report card ratings of these behaviors for five days at school, and then began to send the report card home. The total length of the program for Darren was two months (39 observation sessions).

Correlations between teacher ratings and observational data.

The correlational analysis (summarized in Appendix H1) showed very little correspondence between teacher ratings of out of seat and the observed frequency of this behavior ( $r = .17$ ,  $p = .19$ ). The graph of the observational data for out of seat (Figure 5) shows that a substantial reduction in the level and variability of this behavior occurred at the beginning of the teacher rating phase. It is suggested that the poor correlation between those data and the teacher's ratings was due to the teacher's inability to discriminate between low frequency levels of out of seat after this substantial treatment effect. A moderate

# DARREN

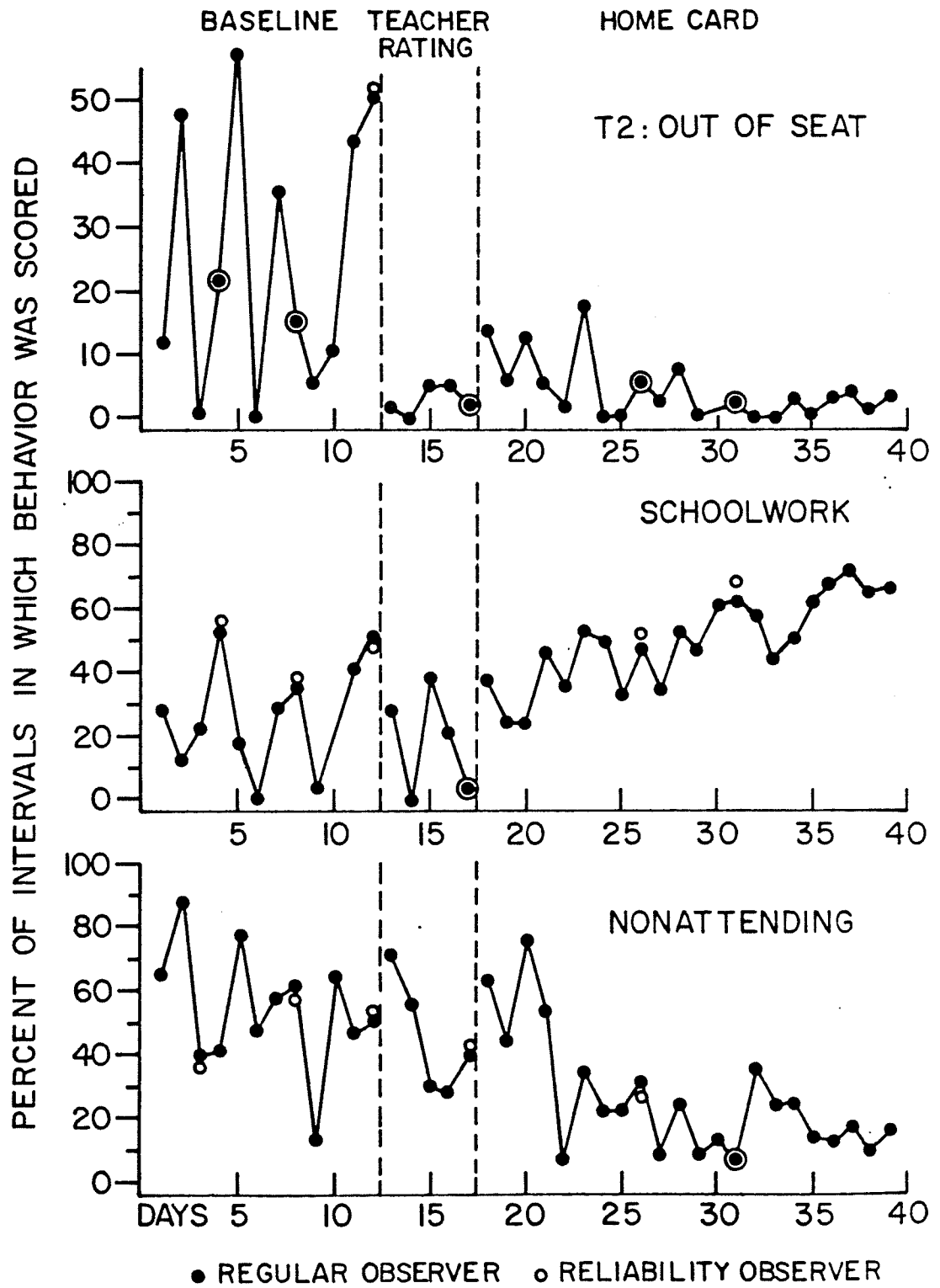


FIGURE 5: PERCENT OCCURRENCE OF DARREN'S TARGETED BEHAVIORS.

correlation was found between the teacher's ratings of schoolwork and the observed frequency of schoolwork ( $r = .52, p .002$ ) and nonattending ( $r = .42, p .01$ ). A high negative correlation was also found between teacher ratings of schoolwork and the observed frequency of aggression ( $r = .63, p .001$ ). In summary, it appears that Darren's teacher was unable to accurately discriminate between levels of out of seat after an initial reduction, but was able to distinguish between schoolwork and competing behaviors with some accuracy.

School observation data. The means and standard deviations of the observed frequencies of Darren's school behaviors are presented in Table 8. Time-series analyses performed on these data are reported in Appendix H<sub>2</sub>.

The observational data for the targeted behaviors out of seat and schoolwork/nonattending are presented graphically in Figure 5. The data show that a sharp reduction in the frequency of out of seat occurred immediately after teacher rating began. This change in level was highly significant ( $t = 3.61, df = 11.6; p .004$ ), and was maintained throughout the program. Significant changes in level were also observed for schoolwork, which increased following the introduction of the home card ( $t = 1.94; df = 25; p .05$ ), and nonattending, which decreased in the homecard phase ( $t = 2.11; df = 25; p .05$ ). It is interesting to note that

Table 8

Darren: Mean Frequencies and Standard Deviations  
of School Behavior Categories

Behavior Category	Mean Frequency (%)			Standard Deviation		
	<u>A</u>	<u>B</u>	<u>C</u>	<u>A</u>	<u>B</u>	<u>C</u>
T1: Interrupting	4.38	1.84	1.09	2.4	2.1	2.3
T2: Out of seat*	25.37	2.68	4.08	21.5	2.3	4.8
T3: Aggression	2.40	2.18	0.04	3.3	2.3	0.2
Compliance	12.55	13.55	18.31	9.9	13.5	13.4
Opposition	22.87	16.87	11.22	19.1	20.6	13.3
Noncompliance ratio	27.41	13.25	31.63	26.8	16.2	29.4
Schoolwork*	25.81	28.26	47.25	16.7	29.2	17.3
Attending*	20.02	26.40	26.98	25.2	24.7	19.7
Nonattending	54.07	45.34	25.75	19.4	18.3	18.8
Approach to adult	7.64	3.14	2.54	9.6	2.1	1.9
Interact adult	6.03	1.98	3.07	3.6	1.8	2.7
Approach to child	9.15	4.66	4.05	3.4	1.7	2.5
Interact child	31.27	49.16	20.34	13.5	16.5	15.7
Instruction +	2.53	1.50	2.36	1.2	1.2	1.6
Instruction -	0.20	0.50	0.33	0.4	0.8	0.8
Adult attention +	7.40	2.86	5.42	4.9	2.6	3.9
Adult attention -	1.72	1.50	1.76	2.0	1.8	1.4
Child attention +	38.37	52.48	23.95	14.6	15.5	15.6
Child attention -	0.00	0.00	0.45	0.0	0.0	0.7

Note: A = baseline, B = Teacher rating, C = Home card

\* Behaviors targeted with report card.

teacher feedback alone appears to have been sufficient to reduce Darren's out of seat behavior, whereas parental consequences were necessary to improve his academic behavior.

A number of changes were observed in other behaviors which were identified as problems but not targeted for intervention. Figure 6 presents data for the behaviors interrupting, aggression, and opposition. Darren's interrupting decreased significantly in the teacher rating phase ( $t = 2.06$ ;  $df = 15$ ;  $p = .05$ ), and approached zero in the home card phase. His aggression also began to decrease with teacher rating, and decreased significantly further in the home card phase ( $t = 4.57$ ;  $df = 25$ ;  $p = .001$ ). Opposition was more variable, but decreased steadily, though nonsignificantly, through the teacher rating and home card phases.

Figure 7 presents the changes which occurred in Darren's pattern of social interaction during the program. A nonsignificant reduction occurred in the frequency of Darren's approaches to his teacher during teacher rating, and was continued in the home card phase. A small but significant reduction in Darren's social interaction with his teacher also occurred during teacher rating ( $t = 2.37$ ;  $df = 15$ ;  $p = .03$ ), and was maintained in the home card phase. The frequency of Darren's approaches to other children also decreased significantly in the teacher rating phase ( $t = 2.77$ ;  $df = 15$ ;  $p = .02$ ) and remained at this level. Darren's interactions

# DARREN

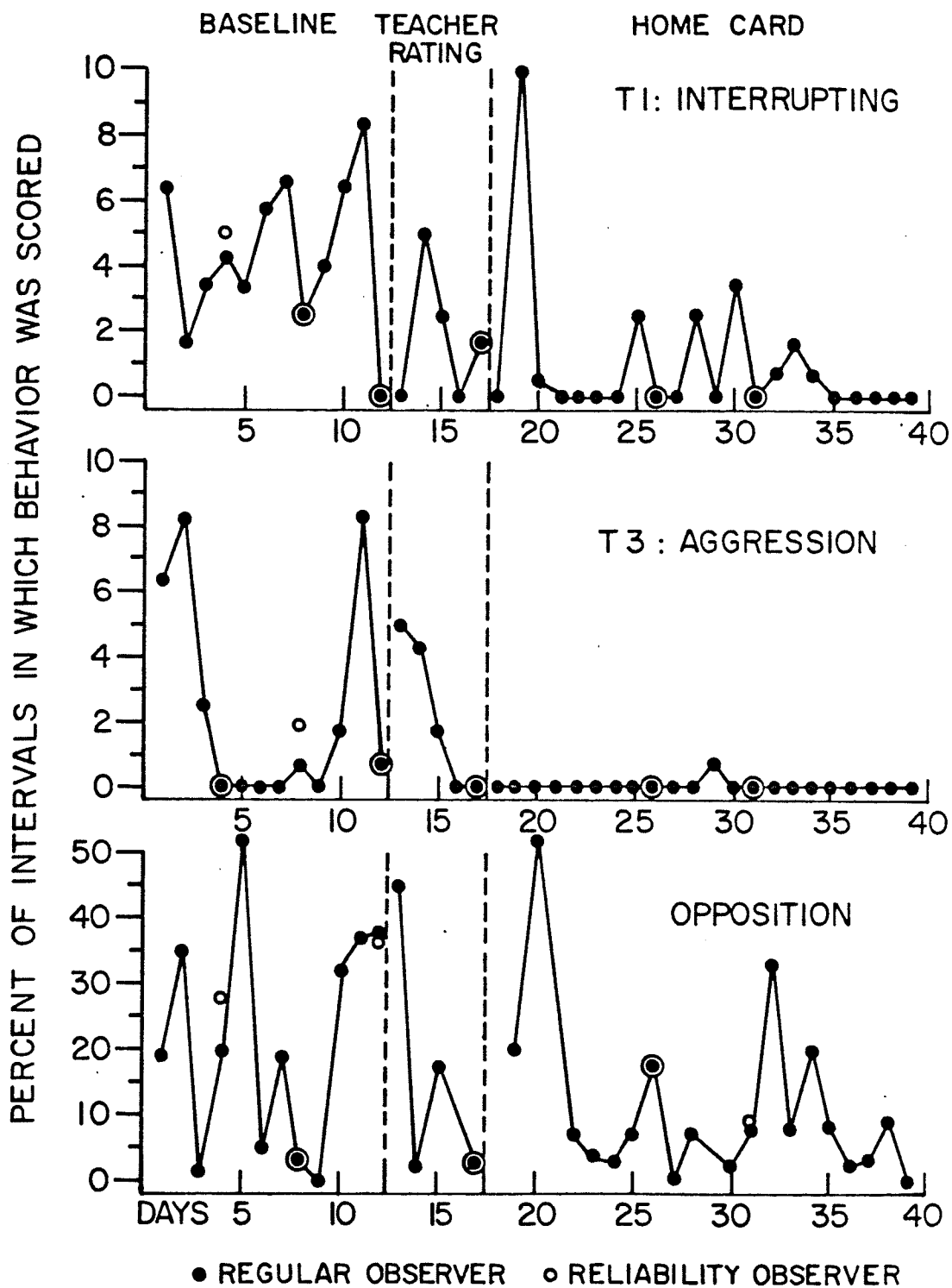


FIGURE 6: PERCENT OCCURRENCE OF DARREN'S NONTARGETED PROBLEM BEHAVIORS.

# DARREN

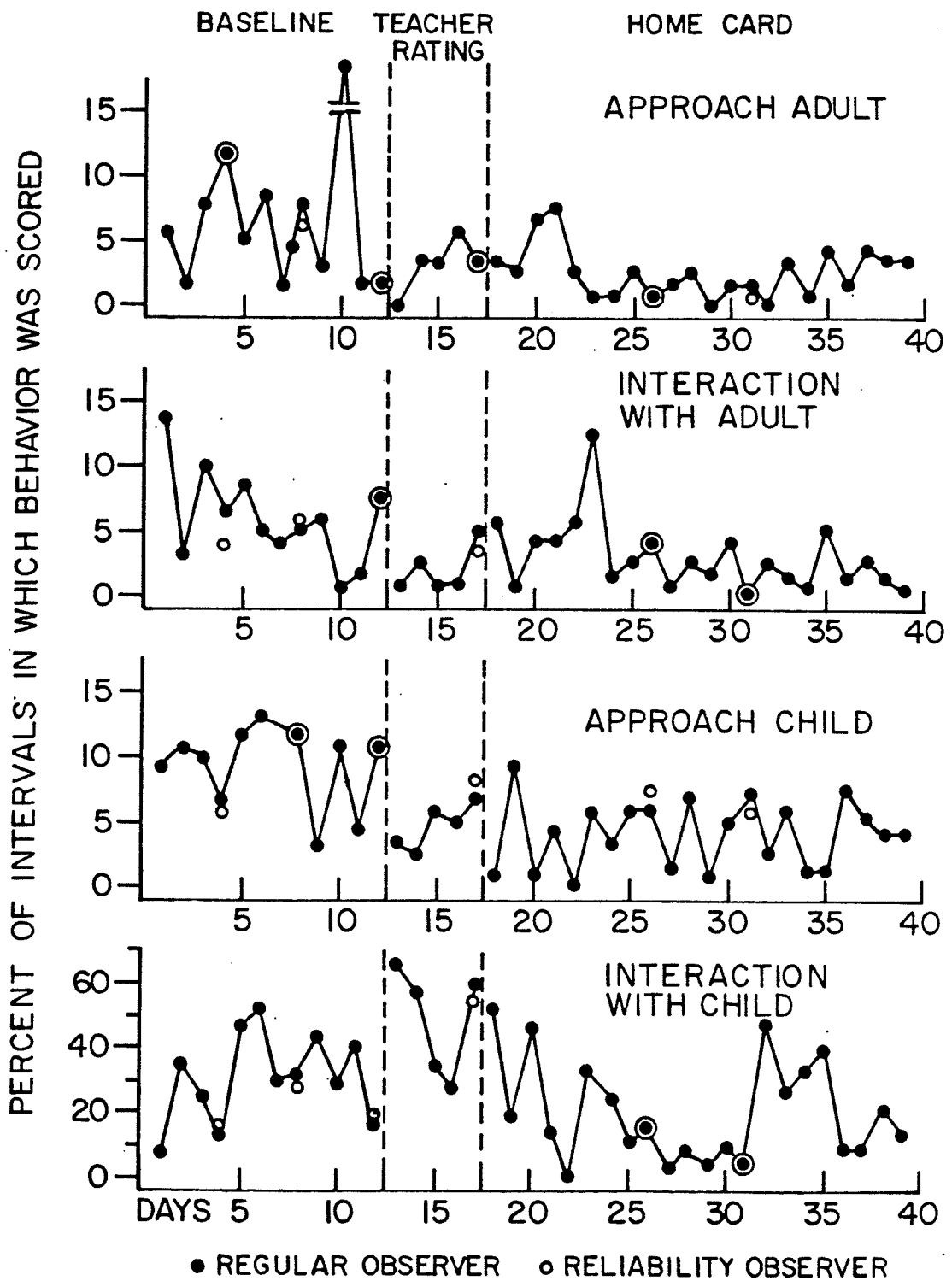


FIGURE 7: PERCENT OCCURRENCE OF DARREN'S SOCIAL BEHAVIORS.

with other children initially increased during teacher rating ( $t = 2.34$ ;  $df = 15$ ;  $p = .04$ ), but then decreased to below baseline levels during the homecard phase ( $t = 3.68$ ;  $df = 25$ ;  $p = .001$ ). The increase in interaction time with children during the teacher rating phase appears to have been the result of increased approaches to Darren by other children, since his approaches to children decreased during this time and the average length of the interactions did not change. A close examination of the data revealed that peer approaches to Darren initially increased as his approaches to them decreased. Peer approaches then decreased, presumably because they met with no response from Darren. This decrease was concurrent with the reduction in levels of Darren's social interaction with children in the home card phase.

There was no significant change in the nature or amount of social attention provided to Darren by his teacher during the intervention (Figure 8). The overall levels of child attention nonaversive provided to Darren increased and then decreased in parallel with the frequency of peer approaches (not graphed). These changes were not significant.

Teacher and parent report data. Darren's teacher rated his behavior at the beginning and end of the program on the CARS and the HRI. Her ratings are summarized at the bottom of Table 9. It is evident that Darren was regarded by his teacher as having very serious



# DARREN

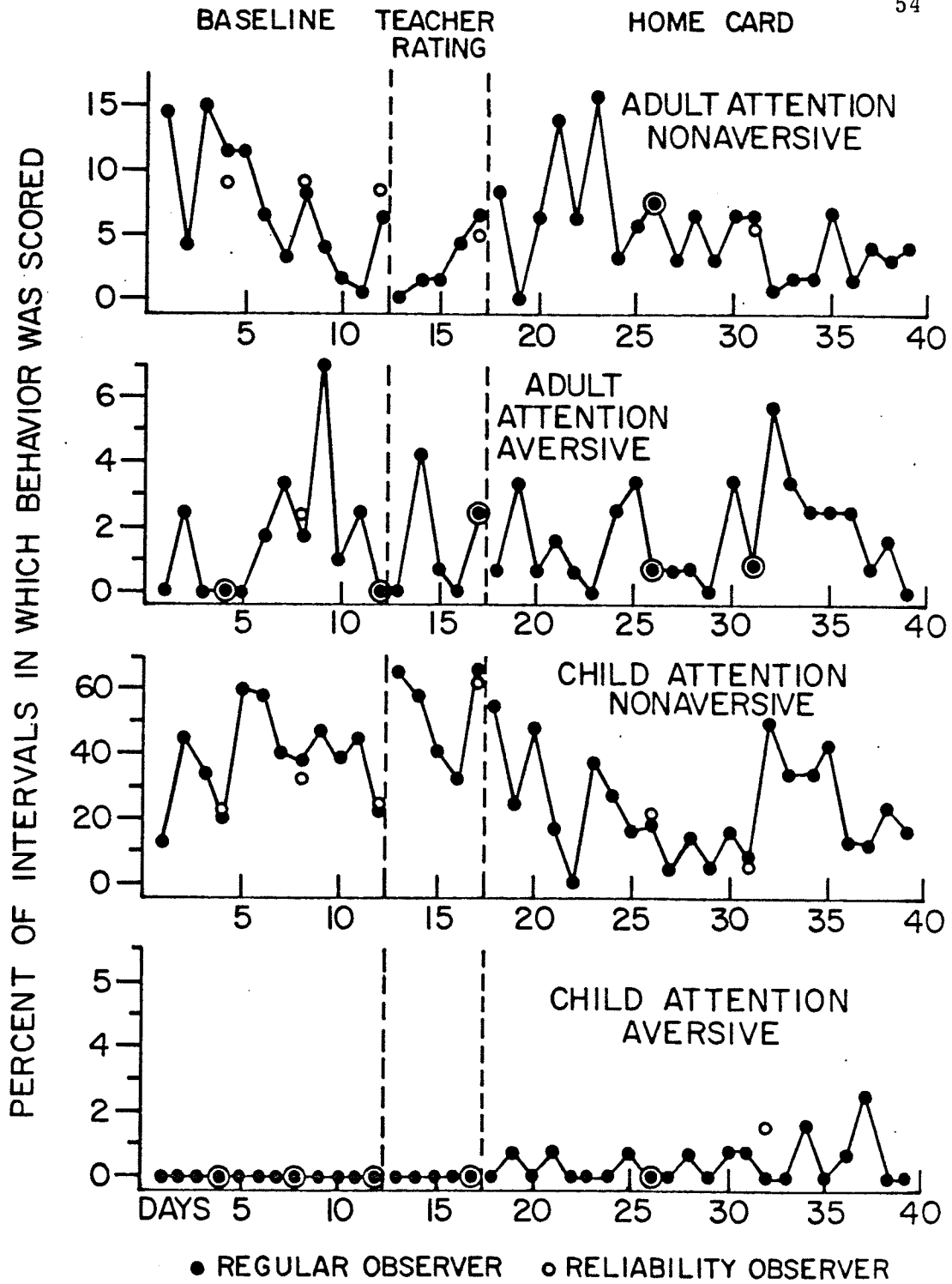


FIGURE 8: SOCIAL ATTENTION RECEIVED BY DARREN.

Table 9  
Darren: Teacher and Parent Report Data

Scales	Population Norms		Pre		Post	
	X	S.D.	Raw	%tile	Raw	%tile
<b>LOUISVILLE BEHAVIOR CHECKLIST (parent)</b>						
Infantile aggression	2.96	3.96	11	95	2**	64
Hyperactivity	3.25	2.95	5	81	4	72
Antisocial behavior	0.74	1.24	1	82	0	60
Aggression	6.08	6.22	13	90	5*	63
Social withdrawal	2.79	3.04	2	61	1	41
Sensitivity	2.37	2.27	3	74	1	43
Fear	1.86	2.04	5	92	3*	80
Inhibition	6.72	5.93	11	82	5*	53
Academic disability	2.89	3.16	2	56	1	49
Immaturity	1.21	1.81	0	47	0	47
Learning disability	3.99	4.31	3	61	3	61
Normal irritability	5.46	3.17	4	39	2	18
Severity level	14.03	12.91	21	80	8*	45
<b>CLASSROOM ADJUSTMENT RATING SCALE (teacher)</b>						
Acting out	13.41	7.59	42		12**	
Shy/anxious	18.51	7.08	26		18*	
Learning problems	22.71	10.58	40		22*	
Total	62.32	20.28	108		58**	
<b>HEALTH RESOURCES INVENTORY (teacher)</b>						
Good student	2.28	0.95	3.13		4.46*	
Adaptive assertiveness	3.14	0.97	3.89		4.93*	
Peer sociability	4.32	0.97	4.16		5.93*	
Rules	2.97	1.06	1.79		3.79*	
Frustration tolerance	2.52	1.05	2.73		4.15*	
Factor sum	15.24	3.60	15.70		23.26**	

\* Change of at least one standard deviation from pretest.

\*\* Change of at least two standard deviations from pretest.

classroom problems at pretesting. His ratings on all of the factors of the CARS were elevated, with the Acting Out and Learning Problems factor scores being extremely deviant. At the end of the program, Darren was rated as very much improved on all of the CARS factors, with the greatest improvement appearing on the Acting Out and Learning Problems factors. Darren was rated on the HRI at pretesting as having adequate health resources in all areas except rule following. His posttest ratings were at least one standard deviation better on every factor, including Rules. These data reflect Darren's teacher's perception that both his academic and behavior problems and his personal adjustment were greatly improved by the intervention.

Additional information regarding Darren's school performance was obtained from his official school report cards. Two report cards were completed before the beginning of the program, and one was completed immediately afterwards. The earlier reports indicate that Darren was having problems relating positively to peers, was fighting on the playground, had poor punctuality, and did not follow directions well. The final report stated that Darren's peer relationships and classwork were much improved, and that no problems with aggression had occurred. These reports are consistent with the CARS and HRI data.

Darren's mother completed the LBCL on him at the beginning and end of the program. Her ratings are summarized in Table 9. At the start

of the program, Darren's mother's ratings placed him at the 95th percentile on the Infantile Aggression scale, and above the 90th percentile on the Aggression and Fear scales. He was also rated as deviant on a number of other scales. At the program's end, Darren's mother rated his home behavior as improved on all scales of the LBCL. His Infantile Aggression scale score improved by two standard deviations, and his ratings on the Aggression, Fear, Inhibition and Severity Level scales improved by at least one standard deviation.

Summary. Both of Darren's targeted behaviors and a number of identified but untargeted behavior problems were significantly improved following the intervention. Teacher feedback alone appears to have been sufficient to effect change in behaviors relating to classroom deportment (e.g., out of seat, interrupting, aggression, approach child). The brevity of the teacher rating phase makes it impossible to assert that this behavior change would have been maintained in the absence of other reinforcement contingencies. It is clear, however, that home reinforcement contingencies were necessary to effect changes in classroom academic performance (schoolwork, nonattending). Darren's teacher recognized and reported the improvement in his classroom behavior, but she did not alter her pattern of attending to Darren as a result of this. Darren's mother also reported general improvement in his home behavior following the program.

Subject 4: Robbie

Robbie was a 10 year old who was referred by his 4th grade teacher because of classroom underachievement and acting out. Robbie's teacher felt that he was a bright boy who was working below his potential because of emotional problems and a lack of discipline. The problem behaviors identified by his teacher included: vulgar language, interrupting, non-attending, and talking instead of completing classwork. These and related behaviors were also problems at home. Robbie's mother reported difficulties with noncompliance and noncompletion of homework, and stated that she had very little control over his behavior. All of the problem behaviors identified by Robbie's teacher were targeted for observation. After 15 days of baseline, the behavior "completing schoolwork" was selected as the target of the report card program. This behavior was measured by the observation codes schoolwork, nonattending, and off-task talking. Robbie's teacher gave Robbie feedback at school on his performance for 5 days before sending report cards home for 20 days. The total length of the program for Robbie was two months (40 observation sessions).

Correlations between teacher ratings and observational data.

Correlational analyses (presented in Appendix I<sub>1</sub>) revealed a moderate correspondence between teacher ratings and school observational data. Teacher ratings of "schoolwork completed" correlated .43 with

schoolwork ( $p < .02$ ), .48 with nonattending ( $p < .01$ ), and .55 with off-task talking ( $p < .002$ ). This indicates that Robbie's report cards accurately reflected his classroom performance.

School observation data. The means and standard deviations of the observational data collected on Robbie are presented in Table 10. Time-series analyses are reported in Appendix I<sub>2</sub>.

Data for the targeted behaviors schoolwork, nonattending, and off-task talking are presented in Figure 9. It is apparent from these data that the report card program had no significant impact on Robbie's school problem behaviors. There was a decrease in approach child during the teacher rating phase, and a decrease in social interaction with child in the home card phase, but these changes were of small magnitude and were not significant.

Data describing the nonaversive social attention provided by Robbie's teacher and peers are presented in Figure 10. (Levels of aversive social attention were near zero, and are not graphed here.) A small decrease in the level and trend of child attention nonaversive occurred with the start of teacher rating, but this was not significant. No other changes were apparent.

Teacher and parent report data. Robbie's teacher's pre- and posttreatment ratings on the CARS and HRI are presented in Table 11.

Table 10

Robbie: Mean Frequencies and Standard Deviations  
of School Behavior Categories

Behavior Category	Mean Frequency (%)			Standard Deviation		
	<u>A</u>	<u>B</u>	<u>C</u>	<u>A</u>	<u>B</u>	<u>C</u>
T1: Interrupting	0.62	0.94	0.96	1.0	1.0	1.4
T2: Out of seat	3.46	4.26	5.07	3.4	3.5	3.7
T3: Off-task talking*	14.58	13.68	12.28	10.4	5.5	7.1
Compliance	20.99	3.43	25.71	18.9	3.5	22.0
Opposition	6.48	19.73	20.13	7.4	34.2	17.4
Noncompliance ratio	1.41	24.75	15.09	4.9	49.5	34.3
Schoolwork*	40.63	49.44	47.14	16.0	13.3	16.3
Attending	21.47	7.86	16.16	17.0	9.3	22.4
Nonattending*	37.88	42.80	38.18	16.1	18.7	14.7
Approach to adult	3.20	3.34	2.54	3.8	2.6	4.7
Interact adult	9.70	2.34	7.52	8.6	2.0	8.1
Approach to child	6.58	6.34	4.32	4.2	3.7	1.9
Interact child	19.74	14.42	15.09	10.1	4.7	13.4
Instruction +	2.00	1.40	1.05	1.9	1.7	1.6
Instruction -	0.00	0.00	0.00	0.0	0.0	0.0
Adult attention +	10.86	4.72	9.83	8.3	3.2	8.3
Adult attention -	0.00	0.00	0.27	0.0	0.0	1.2
Child attention +	19.27	21.32	18.25	11.8	8.8	14.6
Child attention -	0.06	0.88	0.17	0.3	1.4	0.5

Note: A = baseline, B = Teacher rating, C = Home card

\*Behaviors targeted with report card

# ROBBIE

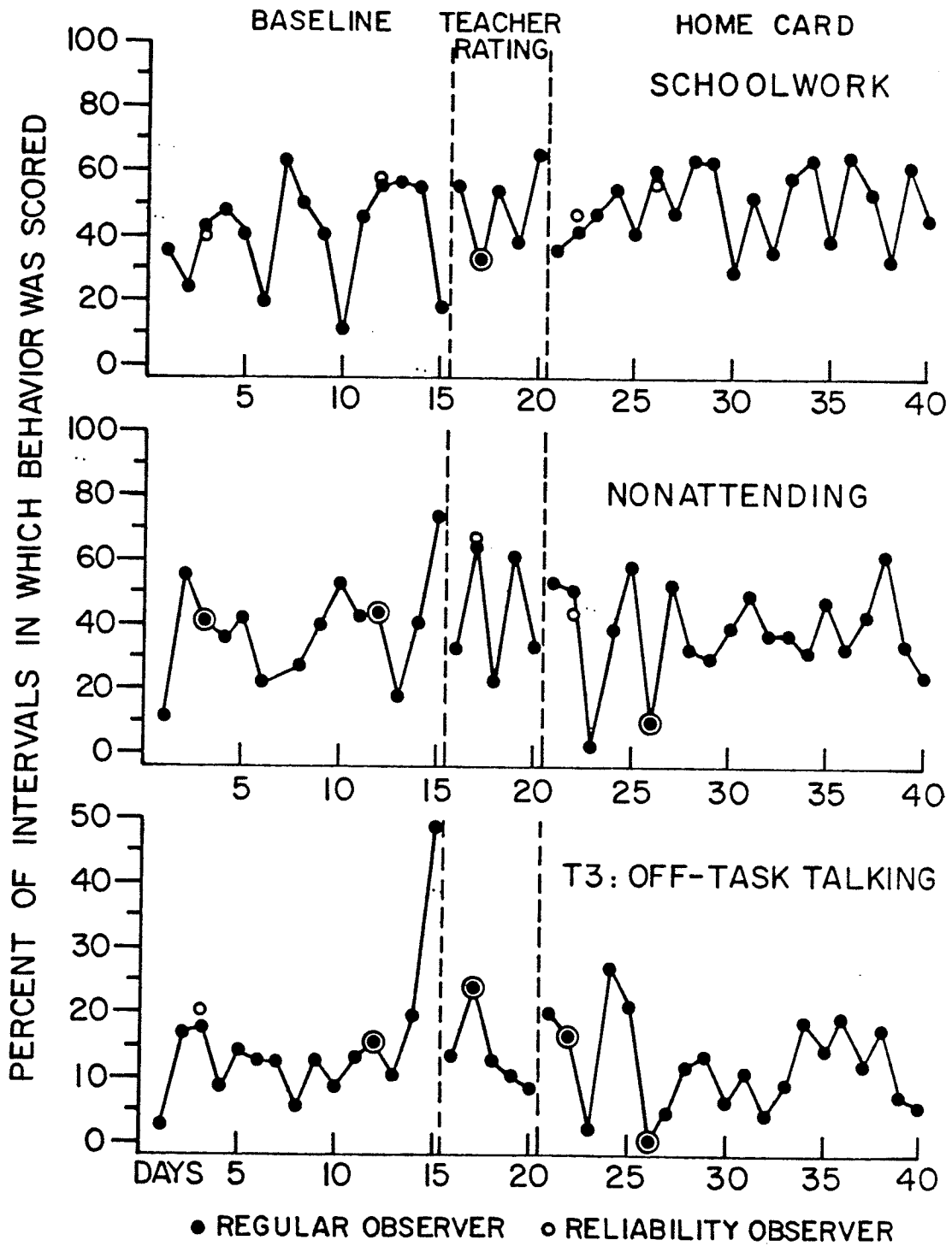


FIGURE 9: PERCENT OCCURRENCE OF ROBBIE'S TARGETED BEHAVIORS.



# ROBBIE

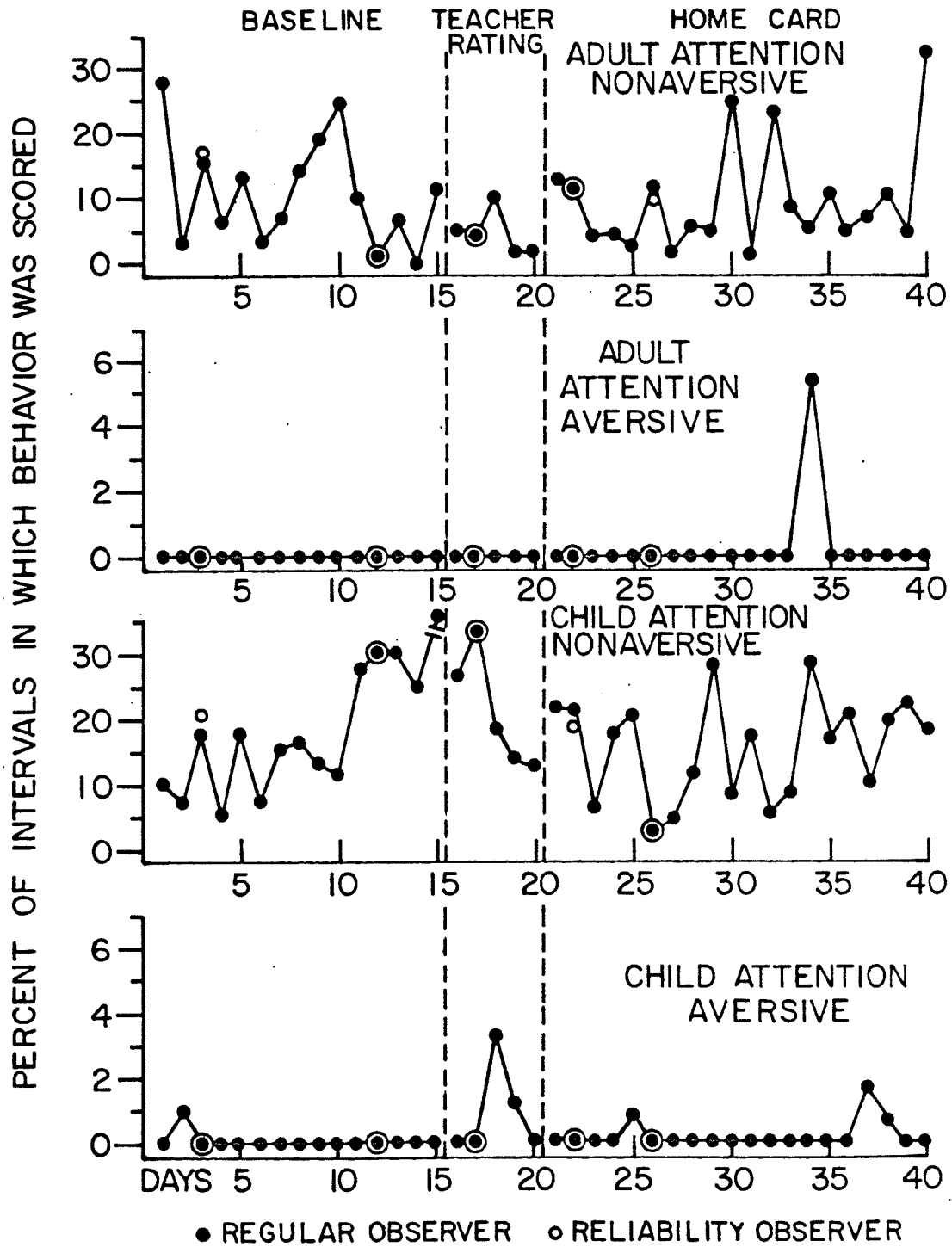


FIGURE 10 : SOCIAL ATTENTION RECEIVED BY ROBBIE

Table 11  
Robbie: Teacher and Parent Report Data

Scales	Population Norms		Pre		Post	
	X	S.D.	Raw	%tile	Raw	%tile
<b>LOUISVILLE BEHAVIOR CHECKLIST (parent)</b>						
Infantile aggression	2.96	3.96	7	89	0*	29
Hyperactivity	3.25	2.95	9	96	4*	72
Antisocial behavior	0.74	1.24	1	82	0	60
Aggression	6.08	6.22	13	90	5*	63
Social withdrawal	2.79	3.04	4	83	1	41
Sensitivity	2.37	2.27	2	61	1	43
Fear	1.86	2.04	4	90	2	71
Inhibition	6.72	5.93	9	72	3*	37
Academic disability	2.89	3.16	6	82	2*	56
Immaturity	1.21	1.81	0	47	0	47
Learning disability	3.99	4.31	6	74	3	61
Normal irritability	5.46	3.17	6	68	4	39
Severity level	14.03	12.91	22	80	6*	33
<b>CLASSROOM ADJUSTMENT RATING SCALE (teacher)</b>						
Acting out	13.41	7.59	21		23	
Shy/anxious	18.51	7.08	22		16	
Learning problems	22.71	10.58	32		33	
Total	62.32	20.28	85		75	
<b>HEALTH RESOURCES INVENTORY (teacher)</b>						
Good student	2.28	0.95	2.99		2.94	
Adaptive assertiveness	3.14	0.97	4.35		3.94	
Peer sociability	4.32	0.97	4.49		4.85	
Rules	2.97	1.06	3.05		3.13	
Frustration tolerance	2.52	1.05	4.94		4.47	
Factor sum	15.24	3.60	19.82		19.33	

\* Change of at least one standard deviation from pretest.

\*\* Change of at least two standard deviations from pretest.

These data show that Robbie was viewed as moderately deviant before and after the program. No changes in his teacher's perceptions of him are apparent.

Robbie's official school report card indicates that Robbie improved considerably in his mathematics skills and in his completion of assigned homework during the program period. These changes can be attributed to a successful reinforcement program established by his mother for doing math work at home. This result is thus viewed as an effect of the parent training procedure which was independent of the report card program. No other changes in school behavior were noted in the official report card.

Robbie's mother rated him on the LBCL before and after treatment. Her ratings are summarized in Table 11. At the beginning of the program, he was rated as highly deviant (at the 90th percentile) on the Infantile Aggression, Hyperactivity, and Aggression scales. He also received deviant ratings on the Antisocial Behavior, Social Withdrawal, Academic Disability, and Severity Level scales. At the program's end his mother rated him as improved on all scales of the LBCL, with improvement of at least one standard deviation occurring on the most deviant scales. These positive changes are probably associated with the successful homework program established at home for math work.

Summary. Robbie's school behavior was essentially unchanged by the report card program. Similarly, there were no changes in the social behavior of his teacher or peers during the program. His mother was able to increase the amount of math work completed at home with a reinforcement program, but this increase in schoolwork did not transfer to the classroom. It should be noted here that Robbie's mother appeared to invest more energy in her own program than in the report card program, with the result that home contingencies for report cards were inconsistently applied. This almost certainly contributed to the lack of change in Robbie's school behavior.

Subject 5: Bryan

Bryan was referred by his teacher and principal because of impulsive, insistent attention seeking behaviors which were disrupting his first grade classroom. He was reported to be unpopular among his peers and was somewhat socially isolated despite his repeated attempts to interact with them. Identified problem behaviors included interrupting and verbally abusing his teacher, pestering other children, noncompliance, noncompletion of classwork, and aggression. Bryan's mother reported that she was unable to control similar high intensity attention seeking behavior at home.

Initial observations were made of the behaviors interrupting, out of seat, and aggression in addition to the standard behavior codes.

Aggression was subsequently dropped due to its low frequency. After 21 baseline sessions, the problem behaviors interrupting and schoolwork/non-attending were targeted for the report card program. Bryan's teacher provided him with feedback at school on his behavior in these areas for five days and then sent home a report card for 22 days. The total length of the program for Bryan was two months (48 observation sessions).

Correlations between teacher ratings and observational data.

The intercorrelations of Bryan's observed school behaviors and teacher ratings are presented in Appendix J<sub>1</sub>. The correlation between the observed frequency of interrupting and teacher ratings of this behavior was not significant ( $r = .10$ ,  $p = .30$ ). However, moderate correlations were found between teacher ratings of schoolwork completed and the observed frequency of schoolwork ( $r = .35$ ,  $p < .03$ ) and nonattending ( $r = .55$ ,  $p < .001$ ). Thus Bryan's teacher was unable to reliably discriminate between different levels of interruption, whereas she was able to provide relatively accurate feedback regarding different levels of academic performance. A possible explanation for this finding is that the low frequency and variability of interrupting ( $\bar{X} = 10\%$ ,  $s.d. = 5$ ) made it more difficult to detect changes in this behavior than in a relatively high frequency behavior like schoolwork ( $\bar{X} = 35\%$ ,  $s.d. = 17$ ).

School observation data. The means and standard deviations of the school observation data for Bryan are presented in Table 12. The time-

Table 12  
 Bryan: Mean Frequencies and Standard Deviations  
 of School Behavior Categories

Behavior Category	Mean Frequency (%)			Standard Deviation		
	<u>A</u>	<u>B</u>	<u>C</u>	<u>A</u>	<u>B</u>	<u>C</u>
T1: Interrupting *	12.11	10.90	8.35	8.1	4.6	5.2
T2: Out of seat	16.73	20.18	11.50	8.9	7.3	9.3
Compliance	18.08	24.18	21.92	12.8	10.1	11.5
Opposition	16.92	16.52	8.49	13.7	5.9	6.8
Noncompliance ratio	36.80	22.60	16.00	18.7	15.5	13.0
Schoolwork*	32.53	31.56	42.65	17.4	11.5	21.5
Attending*	32.20	22.16	36.10	25.5	10.2	27.0
Nonattending	34.21	46.28	24.28	18.3	16.2	13.3
Approach to adult	15.30	10.20	15.44	6.4	4.5	8.3
Interact adult	6.78	14.88	11.79	7.9	19.7	17.8
Approach to child	10.14	9.22	9.92	6.3	1.9	8.6
Interact child	16.18	13.76	19.28	10.4	6.5	10.3
Instruction +	9.83	8.74	9.55	4.5	3.1	4.8
Instruction -	0.85	1.96	2.14	1.2	1.5	1.8
Adult attention +	9.34	12.28	12.13	4.9	8.3	5.8
Adult attention -	5.02	3.46	4.00	3.5	2.3	2.5
Child attention +	22.66	26.92	28.58	12.6	8.4	15.0
Child attention -	0.20	1.18	2.04	0.5	1.3	6.0

Note: A = baseline, B = Teacher rating, C = Home card

\*Behaviors targeted with report card

series analyses of these data are presented in Appendix J<sub>2</sub>.

Data for the targeted behaviors interrupting and schoolwork/ non-attending are graphed in Figure 11. No significant changes were observed in interrupting, although there was a small decrease in the frequency of this behavior in the teacher rating and homecard phases. Schoolwork decreased through the baseline and teacher rating phases, but increased in the homecard phase. Neither of these changes was significant, however. Bryan's nonattending increased gradually during baseline and teacher rating, and then decreased significantly in the homecard phase ( $t = -2.65$ ;  $df = 23$ ;  $p = .02$ ). It thus appears that home reinforcement was associated with behavior change when report card ratings were accurate (schoolwork and nonattending), but not when ratings were inaccurate (interrupting).

A number of changes were observed in behaviors which were identified as problems but not targeted for intervention (Figure 12). The amount of time spent out of seat decreased significantly during the homecard phase ( $t = 2.77$ ;  $df = 23$ ;  $p = .02$ ). The daily percentage of time spent in opposition also decreased significantly during the homecard phase ( $t = -2.41$ ;  $df = 25$ ;  $p = .025$ ). The ratio of Bryan's noncompliance to teacher requests decreased from 36% in baseline to 22% during teacher rating, and further to 16% in the homecard phase.

Figure 13 presents data on the levels of social attention provided to Bryan by his teacher and peers. No significant changes were observed.

# BRYAN

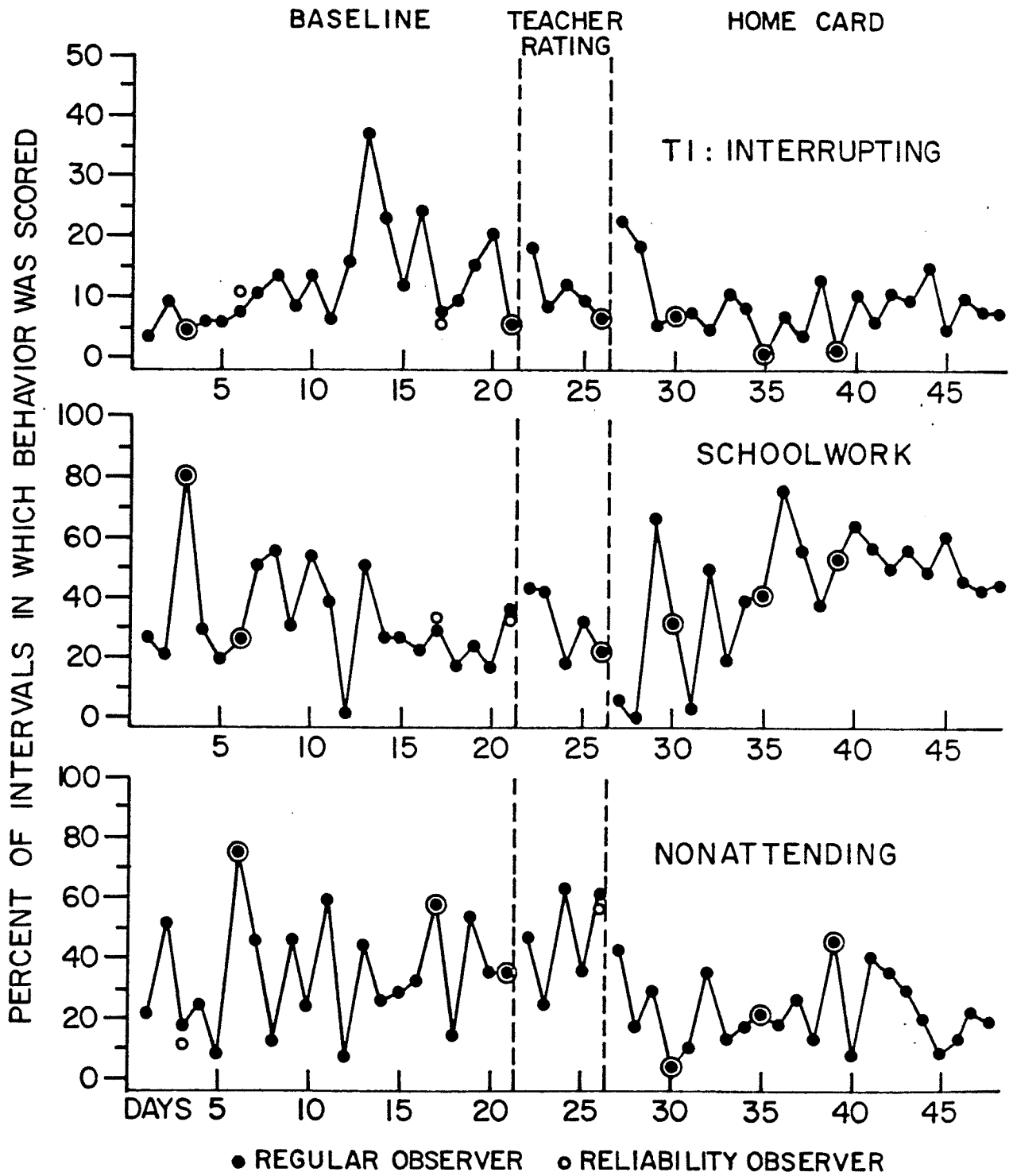


FIGURE II: PERCENT OCCURRENCE OF BRYAN'S TARGETED BEHAVIORS.



# BRYAN

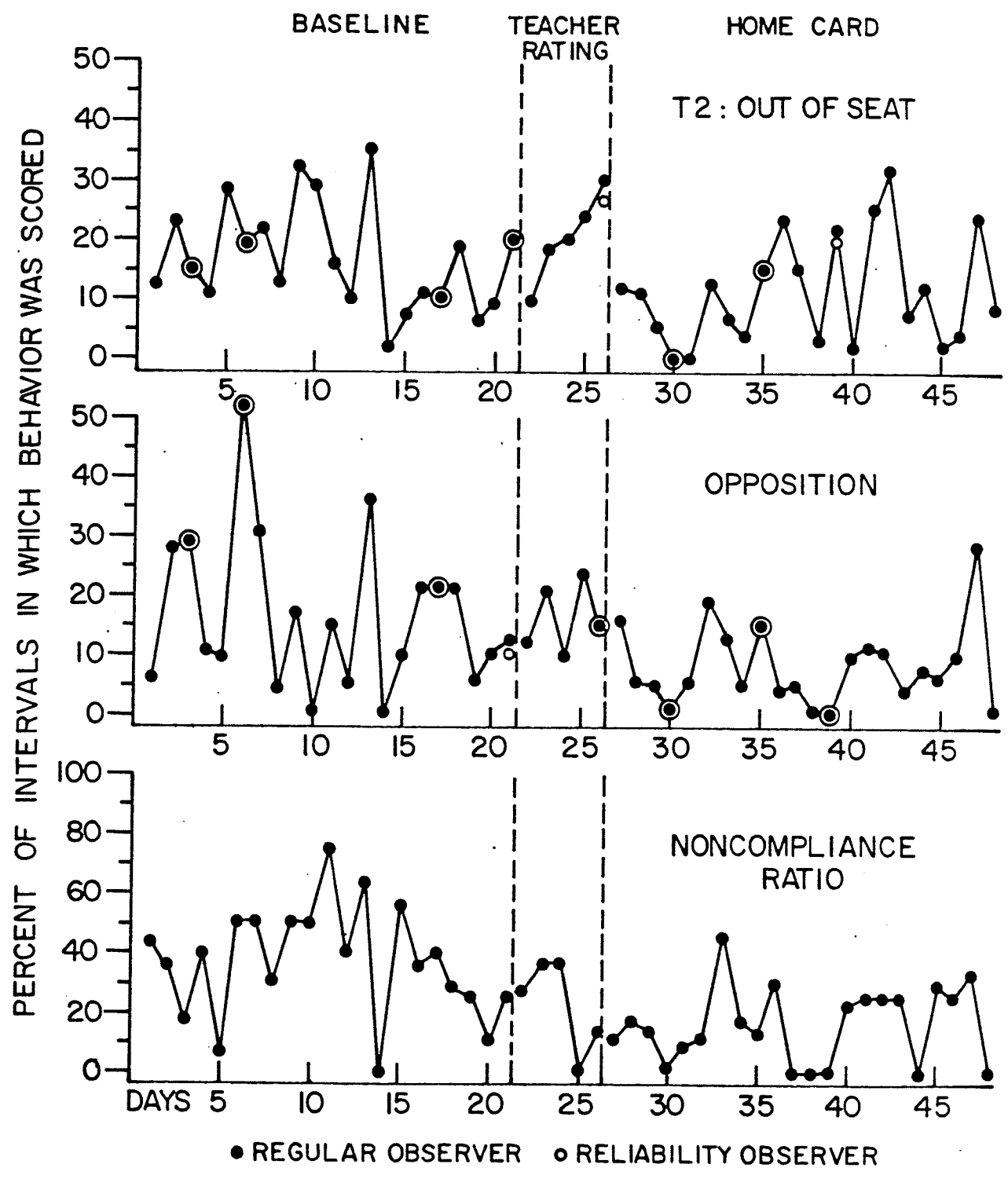


FIGURE 12: PERCENT OCCURRENCE OF BRYAN'S NONTARGETED BEHAVIORS.

# BRYAN

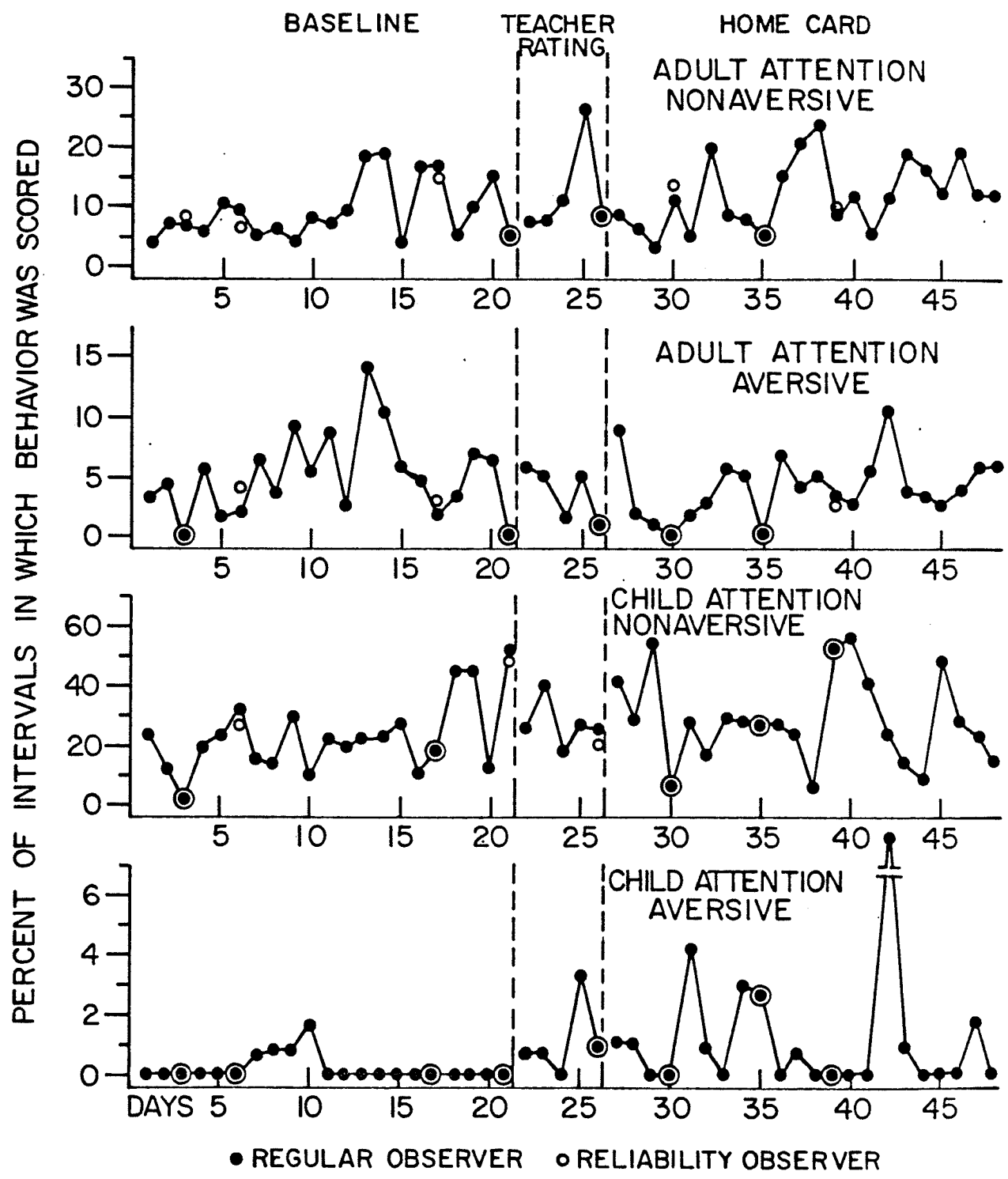


FIGURE 13: SOCIAL ATTENTION RECEIVED BY BRIAN.

However, it is worth noting that there were small mean increases in the amounts of nonaversive adult and child attention received during the teacher rating and homecard phases. Similarly, Bryan spent more time in positive interaction with his teacher and peers during these periods (Table 12). Bryan's teacher and his peers all reported that he had calmed down and was more fun to interact with by the end of the program.

Teacher and parent report data. Bryan's teacher rated his classroom behavior before and after the program on the CARS and the HRI (Table 13). At the beginning of the program, Bryan was rated as extremely deviant on the Acting Out, Learning Problems, and Total factors of the CARS, and as somewhat deviant on the Rules factor of the HRI. After the program, Bryan was viewed as much improved in these areas, and all of his ratings were within normal limits. Additional teacher report data are available from official school report cards completed on Bryan twice before the program and once afterwards. The pre-program report cards mention poor work habits, inadequate social skills, and classroom problems including distractibility, interrupting, and attention seeking. The post-program report card describes good work habits and greatly improved social behavior, and does not mention any of the problems noted earlier.

Table 13  
Bryan: Teacher and Parent Report Data

Scales	Population Norms		Pre		Post	
	X	S.D.	Raw	%tile	Raw	%tile
<b>LOUISVILLE BEHAVIOR CHECKLIST (parent)</b>						
Infantile aggression	2.96	3.96	10	95	2**	64
Hyperactivity	3.25	2.95	10	97	7*	89
Antisocial behavior	0.74	1.24	2	93	1	82
Aggression	6.08	6.22	18	97	8*	75
Social withdrawal	2.79	3.04	4	83	1	41
Sensitivity	2.37	2.27	4	85	2	61
Fear	1.86	2.04	3	80	2	71
Inhibition	6.72	5.93	10	79	5	53
Academic disability	2.89	3.16	7	91	7	91
Immaturity	1.21	1.81	3	91	1*	74
Learning disability	3.99	4.31	10	92	8	86
Normal irritability	5.46	3.17	8	82	6	68
Severity level	14.03	12.91	27	88	11*	56
<b>CLASSROOM ADJUSTMENT RATING SCALE (teacher)</b>						
Acting out	13.41	7.59	32		13**	
Shy/anxious	18.51	7.08	19		15	
Learning problems	22.71	10.58	38		23*	
Total	62.32	20.28	92		56*	
<b>HEALTH RESOURCES INVENTORY (teacher)</b>						
Good student	2.28	0.95	4.03		4.38	
Adaptive assertiveness	3.14	0.97	5.65		5.65	
Peer sociability	4.32	0.97	6.08		6.52	
Rules	2.97	1.06	1.66		2.95*	
Frustration tolerance	2.52	1.05	3.63		3.85	
Factor sum	15.24	3.60	21.05		23.35	

\* Change of at least one standard deviation from pretest.

\*\* Change of at least two standard deviations from pretest.

Bryan's mother's pre- and posttreatment ratings on the LBCL are also presented in Table 13. Before the program, she rated Bryan as extremely deviant on all scales of the LBCL. Her ratings of Bryan on the Infantile Aggression, Hyperactivity, and Aggression scales placed him above the 95th percentile for his age group. At the end of the program Bryan's mother rated him as being much improved in these areas and on all but one of the other LBCL scales.

Summary. The report card program used with Bryan may be viewed as a clear success. Contingent home reinforcement was followed by significant improvement in targeted problem behaviors when teacher reports were accurate. In addition, several identified problem behaviors which were not targeted for intervention showed significant improvement during the homecard phase. There were consistent but nonsignificant increases in the levels of social attention Bryan received from his teacher and peers during the teacher rating and homecard phases. These changes were recognized by Bryan's teacher, who rated him as considerably less deviant at school after the program. Bryan's mother also reported considerable improvement in Bryan's behavior at home.

#### General Summary

The report card program produced mixed results with the five children in this study. These results are summarized in Figure 14, which

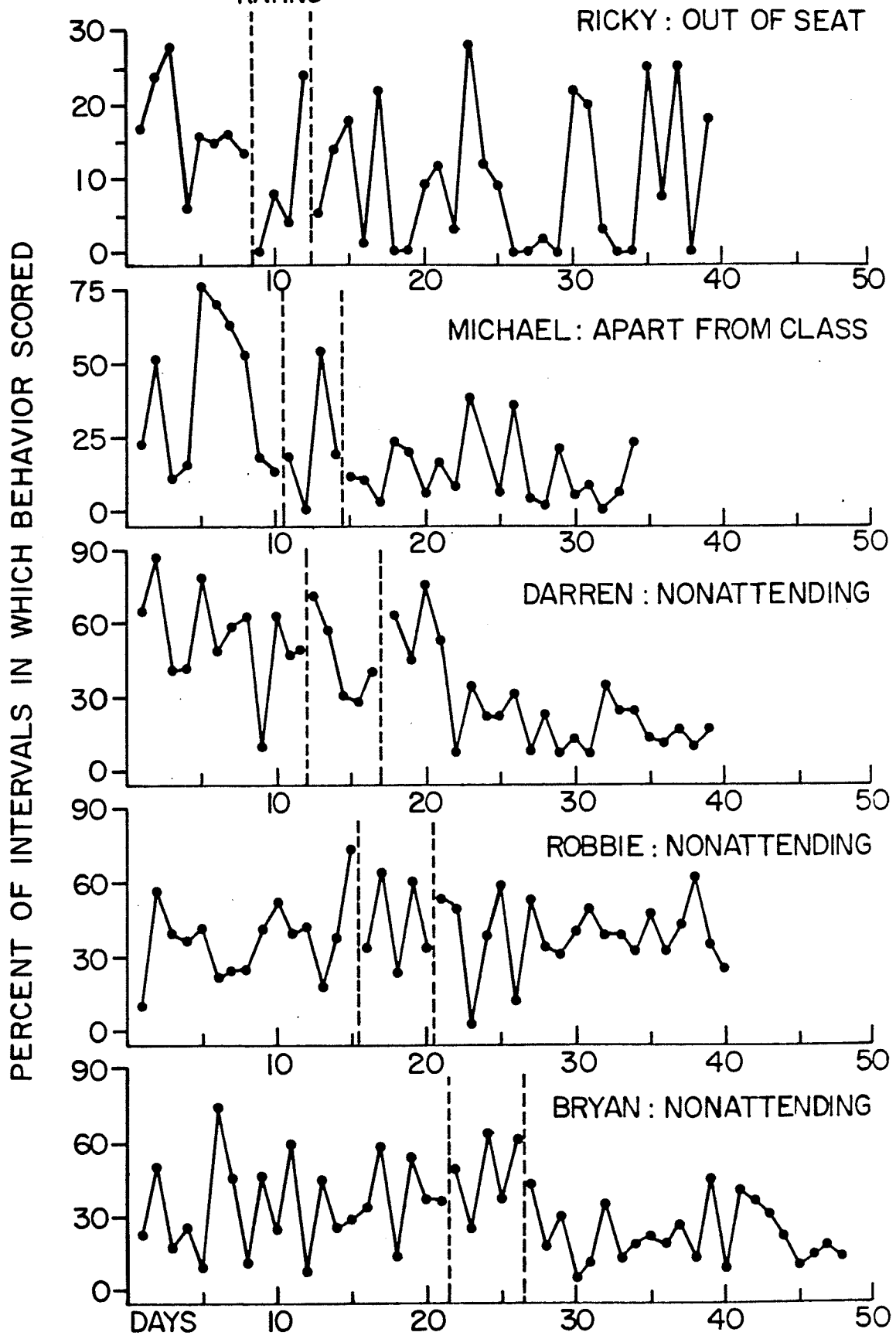


FIGURE 14: SELECTED TARGET BEHAVIORS IN EXPERIMENTAL DESIGN.

presents selected target behaviors in the multiple-baseline format of the experimental design. The report card program produced substantial improvement in two children (Darren and Bryan), limited improvement in a third child (Michael), and no change in the other two (Ricky and Robbie). These findings are in agreement with the teachers' subjective ratings of child behavior change at the end of the program. This pattern of mixed results raises problems in interpretation with a multiple-baseline design, which will be discussed shortly.

Significant behavior change in nontargeted problem behaviors was observed for those children whose targeted behaviors were most improved (Darren and Bryan). This change appears to have resulted from the nonindependence of problem behaviors for each child rather than from response generalization, since identified problem behaviors were highly intercorrelated for all children (Appendices F<sub>1</sub>, G<sub>1</sub>, H<sub>1</sub>, I<sub>1</sub> and J<sub>1</sub>). Thus, the data suggest that acting out and academic problems of the sort treated here may constitute a "response class" (Bijou & Baer, 1967). The implications of this conceptualization will be discussed shortly.

No significant changes were observed in the levels of social attention received by those children who showed positive behavior change. It appears that teachers and peers did not socially reinforce improved behavior when it occurred, at least within the time period during which classroom observation was conducted.

### Discussion

The results demonstrate that a report card program employing home-based consequences can be effective in improving academic and disruptive child behavior in elementary classrooms. This general finding is consistent with the results of a number of other studies employing report card programs (Atkeson & Forehand, 1979). The present study also shows that a report card program can effect change in school problem behaviors not targeted for intervention. The results further indicate that positive changes in child behavior are not reliably followed by increases in teacher or peer attention in the classroom.

Three of the five children who participated in the study showed significant improvement in one or more targeted behaviors, while the other two showed no change. This pattern of mixed results can be attributed in part to the lack of direct experimenter control over treatment implementation which is inherent in parent training projects. All direct contacts with children were made by teachers and parents, and it was difficult to ensure both the accuracy of teacher ratings and the consistency of parental consequences. In view of these problems, the present results may be regarded positively, as evidence of the basic strength of the home report card procedure. Specific issues in implementation which add to or detract from the effectiveness of this procedure will be discussed in a subsequent section.

The failure of two children to show change somewhat weakens the demonstration of experimental control provided by the multiple



baseline design. This design controls for the effects of maturation and unplanned events by demonstrating that behavior change follows treatment onset for subjects with baselines of varying lengths.

Experimental control was demonstrated in the present study when three subjects with different baselines showed clear improvement after treatment began. The fact that no changes were observed in any subjects except following treatment helps to rule out alternative explanations for the improvement. The failure of two subjects to respond to the report card program decreases the reliability of the treatment effect, but does not confound the experimental design.

#### Teacher Rating Versus Home-based Reinforcement

The study attempted to evaluate the effects of both teacher rating alone and teacher rating with home-based reinforcement. Based on the results of earlier studies (Hawkins et al., 1972; Karrasser, 1972), it was predicted that teacher rating alone would not produce significant child behavior change in the classroom. The present results suggest that teacher rating did produce behavior change with some children, but this change was only temporary. Teacher rating resulted in initial improvement in disruptive behaviors for three subjects (Ricky = out of seat, Darren = out of seat, Michael = apart from class), but had no effect upon academic behaviors which were later improved in two subjects during the home report card phase. One interpretation of these results is that the children were more accustomed to teacher feedback regarding their disruptive behavior, and were more practiced

in changing this behavior to conform with teacher demands. It is also possible that the disruptive behaviors required relatively less effort to change than the academic behaviors, and thus were more responsive to a weaker reinforcer (i.e., teacher feedback). This latter explanation seems quite plausible when considering the requirements for good report card ratings for each type of behavior. In order to earn good ratings for disruptive behavior, a child had only to stay in his seat and remain quiet. In order to earn good academic ratings, however, the child had to be nondisruptive and additionally attend to and work actively at assigned tasks. This additional demand may have required greater incentives than teacher praise, and these may have been provided for some children through home-based consequences.

It is difficult to evaluate the full effects of teacher rating in the present study for several reasons. First, there is the possibility that the activity of observing and rating child behavior could have caused teachers to change their behavior toward the children, thus confounding the effects of providing feedback. Hay, Nelson, and Hay (1978) observed an increase in both teacher prompting and responsive child behavior when teachers were asked to record data on children without providing them with feedback. Data from the present study suggest that this effect did not occur, since levels of teacher attention did not change in the teacher rating phase. However, it is possible that changes in the nature or timing, rather than the amount, of positive teacher attention could have occurred and gone undetected.

A second, more major problem with the teacher rating data is that the teacher rating phase was too short to allow an evaluation of the durability of the effects which occurred. The phase was five days long for three subjects, and four days long for the other two subjects. Three subjects showed initial improvement in targeted behaviors with the onset of teacher rating, but two of them reverted to baseline within the five day period (Ricky and Michael). The third child, Darren, kept his out of seat behavior at a low level through the teacher rating and home card phases. It is impossible to say whether this improvement would have been maintained if he had not started to receive home consequences after five days. A report card study by Lahey, Gendrich, Gendrich, Schnelle, Gant, and McNees (1972) found that gains were maintained over a 10 day period in kindergarten children who received teacher feedback and parent praise but no other reinforcement. However, Schumaker, Hovell, and Sherman (1977) observed a gradual decay of gains after 21 and 15 day treatment phases in an adolescent who received teacher feedback and parent praise. The use of parent praise in addition to feedback would be expected to strengthen effects relative to those observed in the present study, but gains were still lost in the Schumaker et al. study. These results suggest that feedback and praise alone may be most effective with younger children (cf. Lahey et al., 1972). The bulk of the evidence from this and other studies seems to suggest that teacher rating alone may produce initial behavior change, but will not

maintain this change in the long term. Research employing a group comparison approach to assess the effectiveness of teacher rating with and without a home card would help to resolve this question. Future research should also examine the differential effectiveness of feedback alone with children of different ages.

### Response Classes

An important finding of the present study was that improvement in targeted behaviors was often accompanied by change in a number of other nonreinforced problem behaviors. Table 9 summarizes the targeted and nontargeted behaviors which changed together. It is evident that a variety of topographically different responses, including both academic and disruptive behaviors, were functionally related in the classroom. Correlational analyses summarized in Appendices G<sub>1</sub>, H<sub>1</sub> and J<sub>1</sub> indicated that the behaviors which changed together were highly intercorrelated throughout the course of treatment. These analyses describe covariation in percent frequency of occurrence scores across observation sessions, but do not shed any light on temporal or sequential relationships within sessions.

These findings suggest that the child classroom behaviors observed in this study were organized in "response classes." As defined by Bijou and Baer (1967), a response class is "a group of responses which develop together. All grow strong or weak, even though the environment may be acting directly on only some of them (p. 78)." Wahler (1975) has demonstrated that the behavior of

Table 14

## Reinforced and Nonreinforced Behaviors Showing Improvement

Subject	Improved Targeted Behaviors	Improved Nontargeted Behaviors
Michael	apart from class	opposition/compliance
Darren	out of seat schoolwork/nonattending	opposition/compliance interrupting aggression
Bryan	schoolwork	opposition/compliance out of seat

individual elementary grade children can be described in terms of unique classes of covarying behaviors which differ across settings and are stable over time. A number of general response classes have been experimentally analyzed, including imitation (Baer, Peterson & Sherman, 1967), language learning (Shumaker & Sherman, 1970), rule learning (Bourne, 1970), and compliance with instructions (Bucher, 1973; Bucher & Reaume, 1979).

Research examining the response class of compliance with instructions has shown that reinforcement for compliance with one instruction may also control compliance with other instructions given in the same setting (Bucher & Reaume, 1979). A number of applied studies have targeted child compliance as a general problem, and have focused on reinforcing compliance to a broad range of instructions (Forehand, 1977). It seems reasonable to regard the behaviors which changed together in the present study (Table 9) as members of the response class of compliance, since all these behaviors involved responding to explicit or implicit instructions in the classroom. The effect of reinforcing targeted behaviors in the report card program may have been to increase compliance to a broad range of teacher instructions and expectations.

This possibility has several implications for the use of report card programs. If academic and disruptive classroom behaviors are functionally related as compliant/noncompliant responses, they may be targeted and reinforced either individually or as a class. That is,

specifically desired behaviors (e.g., schoolwork) may be rated and reinforced separately, or compliance in general may be rated and reinforced. It is important to know whether one approach produces more effective and more generalized behavior change than the other. A number of report card studies have employed global ratings of school behavior which reflect overall compliance with classroom rules and teacher instructions (Ayllon et al., 1975; Coleman, 1973; Heaton, Safer, Allen, Spinnato & Prumo, 1976; Karraker, 1972). These studies appear to have been as effective in changing targeted behaviors as studies employing specific ratings (e.g., Bailey et al., 1970; Schumaker et al., 1977). No studies have directly compared these approaches, however. The present study is the only report card research which has assessed changes in nontargeted behaviors, so it is impossible to compare the generality of behavior change achieved using specific and global ratings. Research comparing these approaches on the dimensions of effectiveness, efficiency, and generality would be very useful.

An obvious implication of the response class notion is that it may be possible to indirectly modify a number of different classroom behaviors by intervening with only one behavior. This effect was observed in the present study, and has been noted in other settings as well (Sajwaj et al., 1972; Walher, Sperling, Teeter, Thomas, & Luper, 1970). The response class approach could be used to deliberately program generalized behavior change, but this has not

yet been done. At present the concept of a response class is descriptive rather than explanatory. Little is known about the variables which control generalization within a response class, or about how such generalized behavior change is maintained without direct reinforcement (Bucher & Reaume, 1979; Wahler, 1975). The present study suggests that research might focus upon explicit or implicit instructions in the classroom as a dimension along which generalization between child behaviors may occur. If instruction characteristics can be identified which control general compliance, then teachers can be trained to use these to maximize generality of behavior change in reinforcement programs which target only a few responses.

#### Social Reinforcement

A secondary hypothesis of the present research was that positive child behavior change at school would result in increased amounts of social reinforcement from teachers and peers (cf. Craigie & Garcia, 1978; Klein, 1971; Sherman & Cormier, 1974). This outcome was considered important because it would create supportive contingencies in the classroom which could maintain behavior change after the end of the report card program. Behavioral improvement is generally not maintained in the long term unless it is supported by reinforcement in the natural environment (Baer & Wolf, 1970). The present results indicate that teachers and peers did not provide more positive attention to the target children after their behavior improved. In fact,



one subject (Darren) received significantly less attention from his peers as he improved, apparently because he initiated fewer contacts with them. These findings are consistent with the results of Drabman and Lahey (1974) and Seymour and Stokes (1976), who observed no increase in peer or caretaker attention levels when identified behavior problems improved.

Before discussing these results it should be pointed out that the behavioral coding system employed in the observations may not have been sensitive to changes in the quality of social attention received. Teacher attention was coded as "aversive" or "nonaversive", with the nonaversive category including both praise and prompts. If praise and prompts had been coded separately, as in Hay et al. (1977), changes in the relative frequency of these behaviors might have been observed. These changes would not necessarily have been reflected in the "non-aversive" category total. Future studies investigating this question should employ a finer grained analysis of teacher behavior than was used here.

Assuming that the present results are valid, it is important to consider why no changes in teacher and peer attention were observed. The expectation that peer attention would increase as classroom behavior improved appears to have been naive. For most children in the study, peer interaction was associated with off-task behavior. Improving academic and disruptive behavior problems usually involved redirecting children's attention, and thereby decreasing their interaction with peers. This confounded any positive effects which may have occurred.

The expectation that teacher attention would increase with positive behavior change may also have been naive, but for a different reason. Teachers generally attend to individual children when prompted to do so by overt behavior. Unfortunately, disruptive acting out is a much more powerful prompt than working on schoolwork, and disruptive children typically receive more teacher attention than compliant children in the classroom (Hall, Lund & Jackson, 1968; Thomas, Presland, Grant & Glynn, 1978; White, 1975). Reducing the disruptive behavior of a target child may have the effect of making him/her less visible in the classroom, and this may limit the amount of teacher attention he/she will receive. In some cases, behavioral improvement may actually decrease levels of teacher attention, as observed by Craigie and Garcia (1978), and as may have occurred with Darren in the present study. The classroom environment is thus not naturally supportive of positive behavior change.

One solution to this problem may be to teach children to actively solicit adult attention for appropriate behavior (Seymour & Stokes, 1976; Stokes, Fowler & Baer, 1978). Stokes et al. (1978) trained deviant children to judge their academic work, and to prompt positive teacher comments about that work when it was good. They found that teacher praise for academic work increased substantially after training, with 85% of the praise occurring in response to child prompts. This study showed that children can solicit reinforcement from the natural environment, but it did not demonstrate that such reinforcement will maintain positive behavior change in the long term. Research

analyzing the maintenance functions of solicited reinforcement will be important for interventions which attempt to program lasting behavior change.

#### Factors Influencing Report Card Effectiveness

Since it appears that the report card program can be a powerful and useful clinical procedure, it is important to examine the conditions which contribute to or detract from its effectiveness. In the present study, negative results were obtained with the report card procedure when one or more of the following problems existed: (1) inaccurate teacher rating of the targeted behavior, (2) selection of inadequate reinforcers, and (3) inconsistent parental consequences for school reports and home behavior. Each of these problems will be briefly discussed.

When teacher report card ratings are inaccurate, home-based reinforcement for school behavior is provided on a noncontingent basis. Report card studies by Ayllon et al. (1975) and Bailey et al. (1970) have shown that behavior change does not occur when good reports are given noncontingently. The present results are consistent with these findings. When the correlation of report card ratings with observational data was near zero for Michael (aggression,  $r = .02$ ) and Bryan (interrupting,  $r = -.10$ ), no changes in the targeted behaviors were observed. The question of how accurate teacher ratings must be to provide useful feedback has never been examined. The present results suggest that ratings which correlate

.40 or more with observational data are sufficiently accurate to produce behavior change ( $p = .01$  when  $N = 40$ ). The correlations in the present study were only moderate (up to .63) and this may have limited the effectiveness of the report card programs. Providing teachers with regular feedback on the accuracy of their ratings might have increased these correlations. More accurate teacher ratings would improve the child's discrimination of appropriate behavior, and reduce the inadvertent home reinforcement of undesirable school behavior. These effects should further strengthen the generally positive results observed in this study.

Another factor which may have contributed to treatment ineffectiveness with some subjects was the selection of inadequate consequences. Robbie quickly became satiated with the small money rewards he received for completing homework and getting good report cards. He stopped earning money for school reports after a brief time, and maintained his school performance at the minimum level required to earn basic home privileges. Ricky responded initially to a reinforcement program providing daily snacks and a weekly toy for good report cards (Figure 14). After 10 days, however, his school behavior became erratic and began to worsen. It appeared that the reinforcers lost value as their novelty wore off. As this occurred, it is hypothesized that Ricky's behavior came back under the control of the reinforcement he received when acting out in class. Much of this reinforcement was provided by his teacher, who consistently attended to him when he engaged

in the target behaviors. No attempt was made to alter teacher behavior in this study, since this would have confounded the effects of the report card program. In clinical practice, however, it would be important to work with the teacher when it appears that his/her attention is a powerful reinforcer for undesirable classroom behavior. Kazdin (1980) describes training procedures for helping teachers and other staff to more selectively reward desirable behavior.

A further problem influencing treatment outcome was inconsistency of parental consequences for report card ratings. It appeared that parents who used punishment extensively prior to training did not learn to attend to and reinforce prosocial behavior while ignoring undesirable problem behaviors. Ricky's parents, for example, typically gave only perfunctory attention to their children until forced to attend by high intensity nagging/acting out. They then loudly threatened or punished their children, who retreated to another room for a short time before renewing their assault. It seemed clear that the children and parents were trapped in an interaction in which negative parental attention reinforced nagging/acting out, and the temporary cessation or nagging/acting out negatively reinforced parental attempts at punishment. This trap prevented the parents from learning to differentially reinforce good school reports and prosocial home behavior because they were unable to stop providing negative attention for acting out.

Ricky's parents received special assistance in structuring reinforcement programs and using time out when the problems just

described became apparent. Even with this help they were unable to change their behavior. More intensive training involving in vivo modeling, behavior rehearsal, and supervision might have been helpful, had they been willing to accept it. Frequent home observations of parental behavior would have helped to provide the necessary corrective feedback early in training, and could have further improved the results. Home observations are expensive and time-consuming, and have not been used regularly in report card programs (Atkeson & Forehand, 1979). However, observations may be necessary when parents appear unable to monitor and modify their own behavior. The weekly reports on parental behavior obtained in the present study were neither immediate nor specific enough to be useful in training.

A final methodological issue in this discussion pertains more to demonstrating positive results than to producing them. The multiple-baseline design used in this study required that children enter the treatment phases at fixed sequential intervals. In several cases (e.g., Michael, apart from class) children began treatment when the baseline rates of their targeted behaviors were decreasing, and it was not possible to show a dramatic treatment effect. Under less rigorous clinical conditions treatment should be implemented when a stable baseline has been established, and behavioral changes which are due to treatment will then be easier to detect.

### Conclusion

The results indicate that home-based report card programs can be effective in improving a variety of academic and disruptive problem behaviors in elementary classrooms. These programs are not only effective in changing the behaviors targeted by the report cards, but also may improve related but nontargeted problem behaviors. Such improvement does not result in increased social reinforcement from teachers or peers, however. It may be necessary to incorporate a procedure for teaching children to solicit praise for improved behavior if classroom gains are to be maintained after program termination.

## Literature Review



### Introduction

Although the principles of reinforcement control have been well established and articulated for some time (Bandura & Walters, 1963; Skinner, 1953), the application of these principles to complex human behavior problems has only occurred within the last 15 years. Most studies reported through 1967 were case reports which focused upon discrete, single-problem behaviors (Berkowitz & Graziano, 1972). In the last decade, applied behavioral research has increased in methodological rigor and in the scope of its concerns. However, there continues to be a need for the development and evaluation of behavioral techniques which are applicable to complex, multi-problem behaviors in the natural environment (Tharp & Wetzel, 1969). Further, there is a need for the development of behavioral programs embodying such techniques which can be effectively implemented by paraprofessionals (Guerney, 1969).

One area in which considerable effort has been expended to develop such a technology is the treatment of behavior disorders in children by their parents. Behavior modification has been discussed as an alternative to traditional forms of child therapy (Rachman, 1962), and has been used with all child diagnostic categories (Berkowitz & Graziano, 1972). In the last decade, increasing attention has been devoted to the development of programs for teaching parents to modify their children's problem behaviors. As Sajwaj (1973) noted, it appears that a true technology for training

parents as therapeutic agents has arisen and is growing rapidly. In 1971, when Patterson reviewed this literature, there were fewer than 20 published studies; at the present time, the number of published parent training studies is well over 100. As is typical in a developing area, many of the earlier studies were case reports with little specification of technical procedures and inadequate evaluation. More recently, however, several groups of investigators (e.g., Forehand & King, 1976; Gardner, Forehand, & Roberts, 1976; Patterson, Cobb & Ray 1972; Patterson, Reid, Jones & Conger, 1975; Wahler, 1969a; Wahler, House & Stambough, 1976) have undertaken continuing research programs for the evaluation and refinement of parent training methodologies.

The use of parents as behavior therapists has at least three major advantages over traditional child psychotherapy: (1) large numbers of active parents in this role may help to offset the severe manpower shortage in mental health care delivery systems (Albee, 1969); (2) parent modification of child behaviors will take place in a natural setting (i.e., in the home), thus eliminating problems in the transfer of clinic-based child treatment (Tharp & Wetzel, 1969); and (3) training parents in effective child management skills may constitute a form of primary prevention which could help to reduce the incidence of child behavior problems (c f. Glidewell, 1971). A further advantage of the parent training approach, as noted by Graziano (1977), is that it places some control over therapeutic policy decisions

in the hands of the mental health service consumer. Behavior modification techniques can be employed by parents in the service of their own goals and values, and the potential for oppressive social control is thereby diminished. Some investigators regard this aspect of parent training as the most attractive feature. As Hawkins (1972) noted,

It is not a matter of whether parents will use behavior modification techniques to manipulate their children, but rather whether they will use these techniques unconsciously with an unknown, unhappy, and unchosen result, or use them consciously, efficiently, and consistently to develop the qualities they choose for their children (p. 38)

Three types of behavior change are required for parent training to be maximally effective (O'Dell, 1974). First, the parents must acquire knowledge of behavior modification techniques, and must change their behavior in such a way as to be able to use these techniques. Second, the new parenting practices must be implemented with the children, and targeted child behaviors must change in the training setting. Finally, changes in parent and child behavior must occur in settings outside the home, and must persist after the training contingencies are withdrawn. At the present time, the parent training technology is most developed with respect to producing parent and child behavior change in the training setting, whereas procedures for achieving behavior change and maintenance in nontraining conditions are just beginning to be examined.

The remainder of this review will discuss relevant theory and research in areas which are pertinent to the present study. First, the

well established methodology of parent training will be briefly summarized. This discussion will be limited to presenting an overview of the dimensions of parent training, along with some conclusions from this literature which may be applied in the design of the present study. Next, general issues in contingency control, transfer, and maintenance will be discussed with reference to both the basic and the applied literature in these areas. Finally, a number of strategies for programming child behavior change in nontraining settings will be discussed, and their actual or potential applications in parent training programs will be examined. The literature pertaining to programming transfer and maintenance of parental behavior change will not be reviewed here, since this area is only tangentially related to the focus of the study. However, those strategies employed in the present study to ensure the transfer and maintenance of acquired parenting skills will be discussed.

#### Parent Training Methodology

The accumulating research evidence on parent training clearly supports the efficacy of this approach in changing parent and child behavior in the intervention setting (Graziano, 1977). It appears that there is no class of overt child behavior which parents cannot be trained to modify (O'Dell, 1974). In addition to a large number of successful but uncontrolled case reports (e.g., Mathis, 1971), studies are available which empirically demonstrate functional relationships between training contingencies and

parent behavior change (Miller & Sloane, 1976), and between parental contingencies and child behavior change (Hawkins, Peterson, Schweid & Bijou, 1966; Wahler, 1979a). Several well conducted comparative studies have demonstrated significant improvement following behavioral parent training relative to no treatment (Wiltz & Patterson, 1974), placebo treatment (Walter & Gilmore, 1974), and both client-centered and psychodynamic family treatment (Alexander & Parsons, 1973).

#### Parent Training Dimensions

A wide variety of procedures have been employed by programs training parents in behavior modification. Some potentially important dimensions of these programs include the format of training (i.e., individual vs. group training), the setting in which training occurs, and the content of training. Considerable variation in training procedures has occurred within each of these dimensions. Parents have been trained in individual consultation (Williams, 1959), in educational groups (Hall, Axelrod, Tyler, Grief, Jones & Robertson, 1972; Walder, Cohen, Brieter, Daston, Hirsch & Liebowitz, 1969), and in controlled learning environments (Bernal, Delfini, North & Dreutzer, 1976). Parent and child training have taken place in a lab or clinic setting (Wahler, Winkel, Peterson & Morrison, 1965), in the home (Zielberger, Sampen & Sloane, 1968), or in a combination of both settings (Patterson, Cobb & Ray, 1972). The content of parent training has varied from directly teaching parents behavioral techniques

(Risley & Wolf, 1967) to teaching behavioral skills along with a verbal understanding of social learning principles and procedures (Johnson & Brown, 1969; Patterson et al., 1972).

While an exhaustive review of the research pertaining to parent training is inappropriate here, some conclusions regarding practical issues in the implementation of training may be noted.

Parent selection. Most parent training studies have involved only mothers, and there is mixed evidence regarding the importance of involving fathers in treatment. Graziano (1977) suggests that fathers contribute substantially to treatment success, but Martin (1978) found no improvement in outcome when fathers were involved. It appears that parents who are experiencing marital discord, or who are themselves classified as having a serious psychiatric disorder, are not good candidates for parent training (Ferber, Keeley & Shemberg, 1974; Patterson et al., 1972). Typically, the inability of one or both such parents to consistently apply reinforcement principles has proven an insurmountable barrier to success (e.g., Bernal, Williams, Miller & Reager, 1972).

Structure of training. Little data is available concerning the relative effectiveness of individual and group training procedures. Success in training has been reported using both approaches, and the selection of one approach over the other should probably depend upon the resources of the training setting. Individual consultation allows

considerable flexibility for specific needs both in training and in program design, but it is costly in terms of professional time. The group approach is not as flexible, but it has the advantage of economy as well as affording an opportunity for parental collaboration. A training program combining these approaches may be the most economical and efficient.

Setting of training. Parents have been successfully trained in both home and clinic settings. Home training minimizes problems in transfer relative to clinic training, and also allows for the observation and direct modification of low base rate child behaviors which might not appear in the clinic setting. Home training also more quickly exposes resistances to change imposed by the family environment, and thus encourages specialized programming. The clinic setting, on the other hand, affords greater opportunity for behavioral control, and encourages structured training. Such structure may be very important for parents learning to implement complex programs requiring precise behavior programming (Lovaas, Koegel, Simmons & Long, 1973). Overall, home training appears preferable when severe behavior deficits are not involved (Wahler, 1976).

Content of training. Training may vary both in the specific content of what is taught, and in the manner in which it is taught. Most programs teach specific behavioral procedures, but some include instruction in social learning principles with the expectation that general knowledge will encourage response generalization by parents. Evidence regarding

this assumption is contradictory, and no conclusions are possible at this time (Glogower & Sloop, 1976; O'Dell, Flynn & Benlolo, 1977; Patterson, 1974). Several investigators have shown that simply teaching parents to observe and record child behaviors may produce significant adult and child behavior change (Herbert & Baer, 1972; Lindsey, 1966). The approach to training may either concentrate upon developing a conceptual understanding of behavioral procedures, or it may focus upon directly teaching parenting behaviors through shaping and feedback procedures. While acquiring knowledge of behavioral skills can improve results (Rimm, Vernon & Wise, 1975), it appears that actual behavioral training is necessary to produce measurable changes in parent behavior (O'Dell, 1974). Modeling and role playing are important components of this training (Nay, 1975). Perhaps most important of all is providing positive reinforcement to the parents as they develop their skills (Patterson, McNeal, Hawkins & Phelps, 1967).

The above is intended as a brief review of some important issues in the parent training methodology. These and other aspects of parent training procedures have been discussed more extensively in earlier reviews of this area (Berkowitz & Graziano, 1972; Eckelman, Note 2; Graziano, 1977; Johnson & Katz, 1973; O'Dell, 1974; Patterson, 1971; Tavormina, 1974). As noted earlier, an aspect of parent training which has not been sufficiently investigated involves the development of



procedures for programming behavior change and maintenance in non-training conditions. The remainder of this review will focus specifically upon this area.

Producing Behavior Change in Nontraining Conditions:  
Basic Issues

The absence of any systematic examination of treatment generality in the parent training literature parallels a lack of data on this topic in other areas of behavior therapy (Stokes & Baer, 1977). In a recent review of the behavioral literature, Keeley, Shemberg and Carbonell (1976) observed that less than 20% of the 146 studies they examined presented some form of generalization data. In part, this neglect can be attributed to the need for researchers to demonstrate control over immediate objectives before broader goals can be pursued (Budd, Note 3). However, such control has been well established in the parent training literature for some time, and the paucity of data persists. As Budd (Note 3) observed, it appears that most researchers have assumed that transfer and maintenance of behavior change would follow automatically from a successful intervention, despite early warnings that this would not occur (Baer, Wolf & Risley, 1968).

The apparent wide acceptance of this incorrect assumption points out the need for applied researchers to have a thorough understanding of the processes which determine treatment generality. Extratraining behavior change may be brought about by a number of different procedures, and

it is necessary to consider the theoretical foundations of these procedures in order to apply them with maximal effectiveness. The following sections are devoted to a discussion of the basic issues involved in generalization and transfer, remote contingency control, and maintenance.

### Generalization and Transfer

In most applied clinical efforts it is possible to directly intervene in at least one of the settings in which the problematic behavior occurs. When behavior change is brought about in this setting it may also occur spontaneously in other settings or responses which were not included in training. The carrying over of the effects of training from one setting or response to another has been referred to both as "generalization" and as "transfer." There is an important distinction between these terms.

The term "generalization" has been used in both a narrow and a broad sense in the behavioral literature. As it is understood in the animal learning literature, "the empirical phenomenon of generalization is the finding that a response conditioned in the presence of one stimulus also occurs in the presence of other, physically different, although related, stimuli" (Nevin, 1973a, pp. 116-117). As Marholin et al. (1976) noted, this narrow usage of the term implies a process explanation of the phenomenon: generalization occurs as a function of stimulus similarity, and the strength of the generalized response is directly related to the similarity of training and test stimuli. A much broader, "pragmatic" definition of the term has been offered by

Stokes and Baer (1977). These authors regard generalization as "the occurrence of relevant behavior under different, non-training conditions... without the scheduling of the same events in those conditions as had been scheduled in the training conditions" (1977, p. 350). This latter definition focuses upon the occurrence of behavior under nontraining conditions as a desired result of training, and does not specify or imply a process producing this result. This usage of the term is thus descriptive rather than explanatory.

Marholin et al. (1976) have argued that it is important to reserve the usage of the term "generalization" for those situations to which the traditional process explanation may apply. They propose that the term "transfer of training" be used in place of the term "generalization" when the object is only to describe the occurrence of behavior under nontraining conditions. Transfer simply refers to "the carrying over of an act or a way of acting from one performance to another" (Woodworth & Schlosberg, 1954, p. 734). Following this usage, generalization can be regarded as a special case of transfer, one which provides a set of basic principles by which transfer operates in a number of situations (Deese & Hulse, 1967). This usage of these terms has been adopted in the present review.

In order to provide a theoretical foundation for later discussion, some further elaboration of the principles by which generalization operates is called for at this point. In both the applied literature and the animal

learning literature, the phenomenon of generalization is usually contrasted with that of discrimination. In a learning situation, generalization and discrimination are different patterns of responding which are controlled by antecedent stimuli. In generalization, responding occurs in nontraining conditions to stimuli which differ along some dimension from those which were present during training; whereas in discrimination responding occurs only in the presence of the same stimuli which were associated with reinforcement during training. Discrimination is encouraged by differential training, in which two or more stimulus conditions are alternately presented, but responding to only one of them is consistently reinforced. Generalization, on the other hand, is facilitated by nondifferential training, in which the stimulus conditions associated with reinforcement are not contrasted with nonreinforced stimulus conditions (Terrace, 1966).

Generalization and discrimination have typically been investigated using different research procedures, and have often been discussed as separate or discrete processes. However, Nevin (1973a) suggested that this distinction has been unhelpful, and he proposed alternatively that factors contributing to generalization or discrimination be considered within the context of the more general concept of stimulus control.

"Stimulus control" refers to the effect upon responding produced by varying the antecedent stimuli present during training. According to Nevin, generalization and discrimination may be viewed as "continuously related

instances of stimulus control, differing in the number of stimuli employed during training and the schedules of differential reinforcement associated with them" (p. 148). These and other factors, such as motivation and attention, combine to determine the stimulus control characteristics of a particular learning situation. Training with many stimuli, and avoiding contrast between conditions of reinforcement and nonreinforcement, both minimize the control over responding acquired by the training stimuli. Weak stimulus control produces responding to a wide variety of nontraining stimuli, i.e., generalization. The procedures of differential training increase the control of the reinforced stimuli over responding, and limit the occurrence of the response to conditions where these stimuli are present (discrimination).

The result of this conceptualization of generalization and discrimination is an appreciation of the extent to which both are controlled by many of the same variables. If generalization and discrimination are not considered as separate, antagonistic processes, but rather are regarded as occurrences resulting from different stimulus control gradients, then one or the other of them may be programmed through appropriate manipulation of their common controlling variables. The stimulus control exerted in a particular training situation results from the combined action of many factors (Nevin, 1973a), and any or all of these factors may be varied experimentally.

The relevance of these principles from the animal laboratory to clinical practice lies in their usefulness in suggesting means for assessing and/or programming various degrees of stimulus control in applied interventions. It is important, however, that such applications in applied settings receive careful evaluation, since the generality of the principles of stimulus control has not been firmly established (Marholin et al., 1976). Several researchers have cautioned against directly extending laboratory findings to clinical practice because of the presumed greater complexity of human responding (Kazdin, 1973; Marholin et al., 1976). While this latter point is certainly well taken, it in no way diminishes the heuristic value of laboratory principles for applied research.

In practice, several types of transfer of training are desired in behavioral treatment programs (Baer et al., 1968; Forehand & Atkeson, 1977; Keeley et al., 1976). Behavior change occurring in the intervention setting should occur in other, nontraining environments (setting generality); and behavior change should spread from targeted behaviors to a wide variety of related behaviors (response generality). In addition, programs which teach paraprofessionals (e.g., parents or teachers) to use behavioral techniques with other individuals are concerned with the transfer of these behavioral skills to individuals not targeted during training (person generality). In the parent training area, this concern is focused upon the transfer of parents' use of behavioral skills to children other than the identified

problem child (sibling generality). All of these types of transfer may result from generalization, as discussed above, or from other processes such as observational learning (see reviews by Forehand & Atkeson, 1977; Marholin et al., 1976; Stokes & Baer, 1977).

#### Remote Contingency Control

Another approach to producing behavior change in nontraining conditions is to provide contingent reinforcement in one setting for behavior occurring in another setting. This procedure will be referred to as "remote contingency control" (RCC). This approach differs from the transfer approach in that producing behavior change in the training setting is not an objective. In RCC, a reinforcement program is established in a setting which contains the resources necessary to maintain the program (i.e., reinforcers, reinforcing agents). This setting is often one where significant contingency control already exists, and where there are few serious problems. The resources of this setting are utilized to provide consequences which could not be consistently provided in the setting where behavior change is desired. A basic requirement of this approach is a reliable and accurate system for reporting change in targeted external behaviors to the program setting. For this reason, cooperation between the parents and a person who serves as a monitor of behavior in the problem setting is essential.

A common application of the RCC approach is found in most school report card programs. The teacher serves as a behavior monitor at

school, and reports to the parents at regular intervals on how their child is doing. The parents use these reports to provide consequences for child school behavior. The result, hopefully, is that appropriate behaviors are strengthened and inappropriate behaviors are reduced. This common application of RCC can be modified for problems requiring immediate consequences by providing for weekly or daily reports. The basic RCC approach can be employed in a variety of settings.

The RCC approach is not a transfer approach because it does not rely upon the carrying over of specific patterns of behavior from one setting to another. The behaviors to be reinforced in the external setting may be altogether different from those which occur in the training setting. RCC is a procedure for extending contingency control which can be used when the conditions necessary for transfer do not exist (i.e., when desired behaviors vary across settings, or when there is no stimulus similarity between settings). The RCC approach may be used in conjunction with a program designed to improve child behavior at home, or it can be used to help parents who can manage behavior at home to extend their positive influence to settings where control is needed. Specific examples of RCC will be discussed shortly.

#### Maintenance of Behavior Change

Once behavior change is achieved in an applied intervention, it must be maintained if treatment is to have a lasting impact (Atthowe,



1973; Keeley, Shemberg & Carbonell, 1976). Response maintenance refers to the continued occurrence of behavior brought about as a result of learning. Applied researchers are concerned with the maintenance of behavior change in a training setting, or with respect to a targeted response or person, after treatment has been terminated. Maintenance is also a concern when transfer to a nontargeted setting, response, or person has occurred, and training conditions are not in effect (cf. Koegel & Rincover, 1977; Wahler, 1969b).

Some authors have regarded the maintenance of behavior change under nontraining conditions as "transfer across time" (Baer et al., 1968; Forehand & Atkeson, 1977). Such so-called "temporal generality" has frequently been lumped together with setting, response, and person generality (Forehand & Atkeson, 1977), with the result that distinctions between the different processes involved have been neglected. While transfer and maintenance are certainly both important to the success of a behavioral intervention (Atthowe, 1973; Baer et al., 1968; Marholin et al., 1976), it seems necessary to consider them as separate aspects of treatment outcome, requiring individual attention (Koegel & Rincover, 1977).

One reason for making this distinction is that transfer and maintenance appear to require different conditions for their occurrence. An example of this in the context of transfer across settings is provided by Wahler (1969b), who observed a brief change in levels of appropriate behavior at

school following the successful implementation of parent training programs in the homes of two children. With no contingencies present in the school setting to support the transferred behaviors, their initial appearance was followed by rapid extinction. Similar short-lived transfer of treatment effects have been reported by Budd, Pinkston and Green (Note 4), Herman and Tramontana (1971), Koegel and Rincover (1977), and McArthur and Hawkins (1975).

These examples underline a theoretical distinction between transfer and maintenance. While transfer is usually controlled by stimuli which precede and accompany responding (as in generalization), maintenance depends upon the consequences of responding, and their scheduled relation to responding (Nevin, 1973a). Responding under nontraining conditions can be temporarily maintained by scheduling effects (Ferster & Skinner, 1957; Nevin, 1973c), but long-term maintenance ultimately depends upon supporting contingencies of reinforcement (Baer & Wolf, 1970). The basis of the distinction between transfer and maintenance, then, is that transfer is usually mediated by antecedent stimuli, whereas maintenance is dependent upon stimuli which follow responding. It is therefore confusing to refer to maintenance as "temporal generality" or as "transfer across time", since it is a function of other variables than those which usually control transfer across settings, responses and persons.

### The Need to Program Generality and Maintenance of Behavior Change

It is generally acknowledged that transfer and maintenance of behavior change are important aspects of therapeutic outcome (Baer et al. , 1968; Marholin et al. , 1976). However, most behavioral interventions which have assessed transfer and maintenance have found them to be absent even when specific behavior change has been achieved (e.g. , Johnson, Bolstad & Lobitz, 1976; Koegel & Rincover, 1977; Miller & Sloane, 1976; Patterson, 1974; Rincover & Koegel, 1975; Wahler, 1969b, 1975; Walker, Hops & Johnson, 1975). This common finding indicates that the conditions necessary for producing transfer and maintenance are not being created by most treatment programs.

Contributing to this state of affairs may be the assumption by researchers that significant transfer will occur naturally with specific behavior change (Skinner, 1953, p. 107). As Stokes and Baer (1977) have noted, generalization has traditionally been viewed as a "passive" phenomenon subordinate to the principles of discrimination. Generalization has been thought of as something that would happen when no attempt was made to produce discrimination. In fact, it appears that the converse of this expectation has proven true in applied interventions: discrimination has occurred when no explicit attempt has been made to produce generalization. One explanation for this is that the procedures employed in most behavioral treatment programs implicitly encourage discrimination (Budd, Note 3). Such typical program features as strict control over environmental contingencies,

clearly specified target behaviors, and individualized training do not ordinarily occur in nonexperimental conditions. Thus behavioral programs may be in such contrast with everyday experience that there is little opportunity for generalization along common stimulus dimensions to occur. It may also be the case that success in the treatment setting is often contrasted with failure in a nontreatment environment. This experience would amount to differential training, and would result in the target response becoming increasingly specific to the conditions of training.

Whatever explanation is offered for the lack of generality of behavioral treatment, it is clear that extratraining behavior change must be programmed if it is to occur reliably (Baer et al., 1968). The same may be said for maintenance, since behavior which is not reinforced will ultimately extinguish (Baer & Wolf, 1970). The need for such programming has been increasingly recognized in recent years, but a well developed technology for producing extratraining behavior change and maintenance is not yet available (Marholin et al., 1976). Stokes and Baer (1977) have noted that an "implicit technology of generalization" has been practiced for some time, as researchers have employed a variety of procedures (e.g., training in the home) with the hope of enhancing treatment generality and maintenance. However, very little systematic evaluation of these procedures has occurred, and data regarding their efficacy are lacking.

The developing technology for programming treatment generality should address itself to several problems. First, it should provide for the continued maintenance of behavior change in the treatment setting after termination of treatment. Second, it should provide both for the transfer or extension of training to nontargeted settings, responses and persons, and for the maintenance of behavior change once this has occurred. With respect to this latter point, it is important to note that when external settings or responses are targeted, programming becomes a two stage process. Behavior change must first be made to occur under nontraining conditions, and then contingencies must be provided which will support the new behaviors in these conditions. Different procedures appear to be required to achieve these different goals (Rincover & Koegel, 1975; Koegel & Rincover, 1977).

The final section of this review will be devoted to the discussion of various strategies for programming extratraining behavior change and maintenance in parent training programs. Specific attention will be focused upon the transfer and maintenance of child behavior change; issues relating to the transfer and maintenance of acquired parenting skills will not be discussed here (see Budd, Note 3, for a brief review of this latter area).

#### Strategies for Programming Extratraining Behavior Change in Parent Training Programs

Several writers have recently reviewed the literature on treatment generality in applied behavior analysis, and have independently provided

lists of strategies for extending and maintaining the effects of applied interventions (Conway & Bucher, 1976; Marholin et al., 1976; Stokes & Baer, 1977). The breakdown of programming strategies provided here draws upon all of these efforts, but was developed primarily from the classification proposed by Marholin et al. (1976). Techniques for programming extratraining behavior change and maintenance in parent training programs will be classified into seven general categories:

1. Contingencies of Reinforcement
2. Manipulation of Reinforcing Agents
3. Stimulus Control
4. Response Characteristics
5. Establishment of Social Stimuli as Functional Reinforcers
6. Schedules of Reinforcement
7. Self-Management

In the following pages, each of these categories will be described, and the actual or potential applications of each programming strategy in the parent training area will be discussed. Studies representative of each technique will be examined.

#### Contingencies of Reinforcement

This approach rests upon the assumption that behavior in a specific situation is a function of the reinforcement contingencies which operate in that situation. Evidence for this assumption is provided in the use of

reversal and multiple baseline research designs which demonstrate the dependence of behavior change upon supporting contingencies across occasions, settings and behaviors (Marholin et al., 1976). In the parent training area, as well as in other applied areas, it has repeatedly been found that behavior change tends to be limited to the situation in which contingencies are applied (Johnson, Bolstad & Lobitz, 1976; Wahler, 1969b). Interventions concerned with producing general behavior change utilize this principle of reinforcement control by creating or employing contingencies which will control behavior in all environments where change is desired. This may involve directly implementing contingencies of reinforcement sequentially across a series of settings or behaviors, or it may involve applying the contingencies available in one setting to responses occurring in other settings.

Sequential intervention. An example of the first approach is provided in a study by Christopherson, Barnard, Ford and Wolf (1976). These investigators taught parents with problem children to administer a home-based token system. This training enabled parents to control child behavior in the home setting, but child behavior in the supermarket continued to be a problem. Subsequently, a second intervention was initiated to teach parents how to manage deviant behavior in the supermarket. Wahler (1969b) provided another example of this procedure. He trained parents to modify oppositional child behavior in the home, but this did not alter levels of

oppositional behavior in the school. Having shown that the home and school settings were functionally autonomous, he then trained the children's teachers to implement the home contingencies at school, with successful results. Sequential interventions such as these may be called for whenever the nature of the training procedures encourages strict stimulus control over responding, such as when responding is differentially reinforced in only one training condition. However, as a strategy for producing treatment generality, sequential intervention is inefficient and costly because it requires that a new program be developed for each setting in which change is desired.

Remote contingency control with home-based reinforcement. A second approach to producing broad behavior change with contingencies of reinforcement involves bringing behaviors in external settings under the control of a single reinforcement program. In this approach, reinforcement contingencies operating in one setting, usually the home, are applied to child behaviors which occur in settings outside the home, such as the school. The approach requires that the child be capable of learning from delayed consequences for his/her actions. It also requires that an accurate record of child behavior outside the home be available to reinforcing agents in the home on a regular basis.

A number of investigators have used a daily report card completed by the teacher and sent home via the child to provide this connecting link



between school behavior and a home-based reinforcement program. In these studies, parents have been instructed to provide privileges and praise for teacher reports of appropriate behavior, and to suspend privileges following reports of misbehavior. This procedure has proven effective in improving academic performance (Cohen, Keyworth, Kleiner & Libert, 1971; McKenzie, Clark, Wolf, Kothera & Benson, 1970; Karraker, 1972; Schumaker, Hovell & Sherman, 1977) and in reducing disruptive behavior in the classroom (Ayllon, Barber & Pisor, 1975; Bailey, Wolf & Phillips, 1970; Coleman, 1973; Lahey, Gendrich, Gendrich, Schnelle, Gant & McNees, 1977). Report card programs have been used with children from second grade to eight grade in both individual and group programs. A report card program was also used at Achievement Place, a family-style group home for delinquent youths, to monitor and improve child behavior during visits to the natural home (Brown, Turnbough, Phillips, Fixsen & Wolf, Note 5).

These programs have shown that it is possible to produce behavior change in nontraining settings without directly intervening in those settings. The report card procedure can be easily adapted for use in a variety of settings, and shows much promise as a technique for extending the effects of parent training beyond the home. However, several important questions concerning this procedure remain unanswered. First, it is not clear whether the intervention has any effect upon academic or

social behaviors which are not targeted for change. Related to this is the questions of how specific the behavior reports must be, and how accurate this feedback must be. Finally, little is known about the durability of treatment effects once the report card is stopped. It is important to know whether external behavior change is supported by reinforcement contingencies in the natural environment, or if it is necessary to program support through environmental manipulation or instruction in self-reinforcement. These questions need to be addressed by further research.

#### Manipulation of Reinforcing Agents

The training of significant others as behavior change agents has often been advocated as a means of "reprogramming" the social environment of a target subject (Patterson & Brodsky, 1966; Patterson et al., 1967; Tharp & Wetzel, 1969). This approach is the central feature of parent training programs. The primary focus of this approach is upon ensuring the maintenance of therapeutic change once such change is initiated. By modifying the parental consequences which support undesired behavior and/or do not support desired behavior, contingencies of reinforcement can be established which will continue to maintain behavior change after the intervention is completed.

Since successful reprogramming requires a continued effort on the part of the parents, it is often necessary to arrange supporting contingencies for parental behavior. Following the reprogramming model,

the most appropriate reinforcer for parenting behavior would be child behavior change. However, such change is not always reinforcing for parents (Patterson, 1971). Patterson and Reid (1970) have suggested that children may be trained to be more reinforcing to their parents, thus increasing their "sending" status and providing the necessary reciprocity in reinforcement to maintain parental behavior. Such efforts would focus on producing immediate change in a simple, nonthreatening child behavior which may enhance parents' estimation of their own effectiveness as well as increasing positive parent-child interactions.

An example of achieving lasting behavior change through reprogramming a deviant child's social environment was provided by Patterson et al. (1967). These investigators worked with the parents of a six year old boy who displayed negativistic and isolative behaviors. Both parents typically used punishment to interrupt bizarre behaviors (e.g., head banging), and did not provide positive reinforcement for appropriate behavior. The parents were taught to reinforce their son first for initiating contact with them, and later for cooperation. As nonaversive contact increased, and the child became more cooperative, parents and child became more reinforcing to each other. Behavior change was maintained at follow-up.

When training involves both parents and children and is conducted outside the home, the parents may facilitate the transfer of child behavior

change to the home by providing cues in the home setting which were present during training (i.e., themselves). Several studies have demonstrated transfer to the home following clinic training of parents (Goocher & Grove, 1976; Lovaas et al., 1973; Peed, Roberts & Forehand, 1977), but none of these has examined the role of the parents as mediators of such transfer. However, given the salience of the parents as reinforcing agents for the child, it seems likely that stimuli associated with the parents would acquire some control over child responding, and thus contribute to transfer to the home (Forehand & Atkeson, 1977). Systematic investigation is needed to confirm this speculation.

In summary, the strategy of manipulating reinforcing agents is one which is implicit in the approach of training parents as behavior modifiers. This is primarily a maintenance strategy, and as such it requires that parents and children become reinforcing to one another. When control over the natural environment is available, this approach is the most effective means of programming maintenance (Conway & Bucher, 1976; Marholin et al., 1976). When it is necessary to train children in a clinic or a laboratory setting, including the parents may facilitate transfer of training to the home.

#### Stimulus Control

While directly reprogramming environmental contingencies is the ultimate solution to the problem of producing extratraining behavior change,

sufficient control may not always be available or practical in settings where such change is desired. This is the case, for example, when child behavior change is desired at school, but extensive intervention is only possible at home. A solution to this problem is employing training procedures at home which will encourage short-term transfer to other stimulus settings (Marholin et al., 1976). Once such initial transfer is achieved, then contingencies already existing in the transfer setting may support the desired behaviors, or such support may be provided through a brief intervention.

One approach to programming initial transfer involves manipulating the factors which influence stimulus control in the training setting. Transfer may be facilitated both by weakening the stimulus control of the training situation, and by programming stimuli which have become discriminative for responding in conditions where transfer is desired. Applied researchers have employed both of these approaches, but none of this work has occurred within the parent training area. Consequently, programming procedures stemming from these approaches will be discussed with reference to other research areas, and implications for parent training will be considered.

Weakening stimulus control. As noted earlier, stimulus control may be weakened both by varying the stimulus conditions present during training, and by employing the procedures of nondifferential training.

The procedure of varying training stimuli involves providing training under a number of different stimulus conditions (e.g., persons, settings, activities, times of day) while consistently reinforcing appropriate responding. The goal of this procedure is to avoid discriminated responding to a particular training condition, and thus to encourage generalization to other conditions. An example of this procedure in programming transfer across persons was reported by Stokes, Baer & Jackson (1974). In this study, one experimenter trained and maintained a greeting response in several retarded children. When it was established that this greeting response did not generalize to other members of the institutional staff, a second experimenter also began to train and maintain the response. Following training with the second experimenter, the children generalized the greeting response to over 20 other staff members who had not participated in training. In a more elaborate investigation of this transfer programming strategy, Emshoff, Redd and Davidson (1976) simultaneously varied trainer, activity, time, and setting in a program to increase peer praise by delinquent adolescents. Two boys trained in these variable conditions showed more responding after treatment and in their homes than two boys who were trained under invariant stimulus conditions.

In nondifferential training, the stimulus condition(s) associated with reinforcement are never contrasted with nonreinforced stimulus conditions. This produces a pattern of generalized responding to related

stimuli (Terrace, 1966). Redd (1970) compared the effects of this training procedure with a procedure which included both reinforced and nonreinforced stimulus conditions (differential training). Two retarded boys received contingent reinforcement for cooperative play from one experimenter, and noncontingent reinforcement from another experimenter. Two other retarded boys received only contingent reinforcement for play from both experimenters. The boys who had received both contingent and noncontingent reinforcement during training did not transfer their cooperative behavior to three novel adults in a different play setting, while the boys who received contingent reinforcement did show transfer. For these latter boys, no discrimination between adults was taught, so that all adults became discriminative for reinforcement.

As transfer strategies, the procedures of varying training stimuli and employing nondifferential training have different underlying rationales. However, the extension of these procedures to the parent training paradigm results in a single set of programming recommendations. In order to encourage initial transfer of child behavior change to other persons (e.g., teachers, peers), care should be taken to ensure that no discrimination between the persons involved in training is taught. All persons in the home who interact with a child in problem situations (e.g., parents, siblings, grandparents, even neighbors) should be involved in consistently reinforcing desired child behavior and extinguishing or punishing undesired

behavior. Similarly, those involved in training may encourage setting generality by taking care not to respond differently to problem child behaviors in different settings. Consistently dealing with oppositional behavior, for example, at home, in the supermarket, and in the homes of friends should encourage the transfer of child compliance to other stimulus settings.

Although several parent training studies have involved planning or supervising parent-child interactions in more than one setting (Christopherson et al., 1976; Patterson et al., 1972), this has not been done with the aim of achieving transfer to still other settings. Consequently, no data have been collected in unprogrammed settings which could indicate the efficacy of this procedure in producing transfer of child behavior change. No studies have systematically examined the effects of employing a variety of people and activities in therapeutic interactions with problem children, and the potential importance of these variables also remains unknown.

Programming common stimuli. When stimulus elements associated with training do become discriminative for responding, transfer to other persons or settings can be programmed by arranging for the appearance of the discriminative stimuli in those nontraining conditions. Alternatively, stimuli which appear to be salient in the nontraining conditions to which transfer is desired may be incorporated into training and made discrimi-



native through differential training procedures. As Stokes and Baer (1977) suggested, one way of evaluating the salience of a stimulus to be chosen for this role is to examine its established control over other important behaviors of the child. For example, if one objective of a training program for a deviant child is to produce transfer of behavior change to a setting where the child interacts with peers, it might be useful to include one of the peers in the training program. The purpose of doing this would be to establish the peer as a discriminative stimulus for the trained behavior, so that he/she could elicit this behavior in the transfer setting. The decision about which of the child's peers to involve in training should be dictated in part by who the child is friendly with: those children who are most involved with the target child have already become salient stimuli for him/her, and they will be more effective in eliciting the trained behaviors than less important peers.

Several studies have employed children's peers as salient stimuli common to several settings (Johnston & Johnston, 1972; Stokes & Baer, 1977; Stokes, Doud, Rowberry & Baer, 1978). Stokes and Baer (1976) trained two children with learning disabilities in word recognition skills. During training, each child was also trained to serve as a peer-tutor for the other child. Although each child learned the skills, neither child transferred them reliably to unprogrammed settings. However, transfer did occur when the peer-tutor was introduced into those settings even though

no reinforcement was provided. Stokes et al. (1978) extended this finding by demonstrating that transfer only occurred when the peer-tutor was salient in the test setting (i.e., when he provided prompts). This is one of the few studies which has demonstrated experimental control over transfer.

The importance of discriminative stimuli in achieving transfer to settings where maintaining contingencies exist was illustrated by Rincover and Koegel (1975). These investigators trained ten autistic children to perform new behaviors in one setting, and assessed transfer to a stranger in a new setting. Four children who failed to show transfer participated in an analysis of stimulus control which isolated the stimulus elements which had gained control over responding in the training setting. These seemingly trivial stimuli (experimenter hand movements, table and chairs) readily produced transfer when introduced in the other setting. This study suggests a means of employing unusual stimulus control when it cannot be anticipated or avoided.

Any parenting program which trains parents and children outside the home implicitly programs transfer by using the parents as common stimuli. However, parent training programs which are based in the home must rely upon different stimuli to encourage transfer to schools and other settings. One approach might be to arrange for persons who are important to the child outside the home to occasionally be present in the home

while the parents' contingency program is in operation. The child's grandparents or teacher might come to be viewed by the child as being involved in the program as a result of this association. These persons might then elicit behavior learned during training in settings outside the home. Other stimuli which could be incorporated into home training and programmed in other settings might include signs, specific instructions, or self-instructions (see following section on self-management procedures). These possibilities have not been explored in the parent training area to date.

In summary, short-term transfer can be programmed by weakening stimulus control in training, or by employing discriminative stimuli from training in other settings. In the parent training area, the first approach involves reinforcing appropriate child behavior under a number of stimulus conditions (persons, settings, activities, times). The second approach involves analyzing existing stimulus control and arranging for the appearance of controlling stimuli in maintaining conditions.

#### Response Characteristics

Two approaches to programming extratraining behavior change and maintenance rely for their efficacy upon characteristics of the responses taught. The first approach involves training behaviors which will provide the subject with access to a reinforcement community which will shape and maintain other behaviors ("behavioral trapping"). The second approach

involves modifying specific elements of a "response class," and thereby indirectly modifying other behaviors which are functionally related. Both approaches primarily affect response generality, although they may indirectly affect setting or person generality.

Behavioral trapping. A behavioral trap (Baer & Wolf, 1970) is a community of reinforcement which shapes and maintains certain behaviors naturally. The peer group of a child is a good example of such a trap. The essence of a behavioral trap according to Baer and Wolf (1970) is that only a simple response is required to enter it, but, once entered, the trap cannot be resisted in creating general behavior change. Programming behavioral trapping therefore involves discovering and training an "entry response" which will introduce the subject to naturally occurring reinforcement contingencies.

An example of trapping a child in an existing community of reinforcement was reported by Buell, Stoddard, Harris and Baer (1968). These investigators reinforced a socially withdrawn three year old girl for increasing her use of outdoor play equipment. Increased outdoor play was an effective entry response to a peer group of other children, who reinforced her playing and also shaped and maintained a number of other social behaviors (e.g., touching, talking).

As Stokes and Baer (1977) noted, potential reinforcement contingencies may need to be activated before they can serve as behavioral

traps. Stokes, Fowler & Baer (1978) taught four normal and four deviant children to evaluate their work and solicit praise from teachers when their work was good. Low baseline rates of teacher praise were increased and maintained by child prompting, thus making available to children sources of reinforcement which had formerly been dormant. Unfortunately, this study did not examine the maintaining function of cued teacher praise for positive child behavior, so there is no way of telling whether any new child responses were shaped and maintained by entry into this community of reinforcement.

The parent training literature has not employed trapping procedures to produce generality of child behavior change outside the home. As noted earlier, some researchers (e.g., Patterson & Reid, 1970) have discussed procedures for making parents and children more reinforcing to each other. This strategy basically amounts to creating a behavioral trap in the home. Many children are trained by their parents in skills (e.g., verbal behavior, grooming, sports) which provide them entry to natural communities of reinforcement outside the home, and where these skills are deficient either in the parents or in the children they may be trained in a remedial program. Teaching children in the home to solicit reinforcement for targeted behavior outside the home (cf., Stokes et al., 1978) is also a potentially important strategy for parent training programs. This might be done, for example, by training children to present completed work

to their teachers , or by coaching children in requesting recognition for positive behavior from other important adults or peers .

Modifying response classes. As defined by Bijou and Baer (1967, p. 78) , a response class is "a group of responses which develop together. All grow strong or weak , even though the environment may be acting directly on only some of them." A number of response classes have been delineated and analyzed , including imitation (Baer , Peterson & Sherman , 1967; Garcia, Baer & Firestone , 1971); language learning (Schumaker & Sherman, 1970); rule learning (Bourne , 1970); and compliance with instructions (Bucher , 1973) .

If child behaviors are organized in functional clusters , as this research suggests , then transfer of training to all responses within a cluster can be achieved by modifying only one component behavior. This fact could enable applied researchers to modify inaccessible behaviors indirectly , by treating more accessible behaviors in the same response class . Few applied studies have employed response class characteristics to achieve transfer to other behaviors , but response classes have been observed in the context of several applied interventions (Sajwaj , Twardosz & Burke , 1972; Wahler , 1975) . Wahler (1975) studied the behavior clusters of two boys , and found that these remained stable over a three year period through a series of contingency manipulations . He also noted different behavior clusters at home and at school for each boy , and observed that

these clusters were functionally independent.

There have been no applications of response class programming in the parent training paradigm. Wahler's (1975) finding that home and school behavior clusters did not covary when contingencies were manipulated in one setting suggests that this strategy may be most useful in programming response generality within a given setting, rather than across settings. Research employing this strategy will have to carefully determine the behavior clusters for each child treated, since so little is known about the stability of behavior clusters across individuals. There is some evidence that compliance with instructions is a fairly stable response class, and this could be important in producing broad child behavior change (provided that parental modeling of nontargeted behaviors is adequate). Research investigating the parameters of these response classes in the home is necessary to evaluate this strategy for producing transfer.

In summary, behavioral trapping and the modification of response classes are strategies for producing extratraining behavior change which both rely upon response characteristics. Behavioral trapping involves programming an entry response to a naturally available community of reinforcement, either active or dormant, which subsequently shapes and maintains new behavior under maintaining conditions. Identifying and

modifying elements of response classes allows behavioral researchers to extend the impact of an intervention to a wide range of functionally related, but nontargeted behaviors. Neither approach has been widely applied, and both require extensive ecological analysis prior to implementation.

#### Establishment of Social Stimuli as Functional Reinforcers

"When a stimulus is paired with an effective reinforcer, that stimulus acquires the capacity to reinforce operant behavior" (Nevin, 1973b, p. 194). Such a stimulus is known as a conditioned reinforcer, and its effectiveness as a reinforcer is related to the frequency or amount of primary reinforcement with which it is paired. Although a conditioned reinforcer requires a continued association with primary reinforcement for its power to be maintained, this association can be delayed for long periods through the use of fading and chaining procedures (Nevin, 1973b). It has been suggested that most important human behavior (i.e., social behavior) is controlled by conditioned reinforcers which are only infrequently associated with primary reinforcement (Nevin, 1973b; Skinner, 1953).

The most important conditioned reinforcers for children are adult attention and praise (Conway & Bucher, 1976). When these stimuli have not acquired reinforcing value to a child, or when they have usually been associated with negative consequences, parents may have difficulty in controlling child behavior (Ferster, 1961; Wahler, 1976). A common



approach to this problem involves altering the reinforcement value of parental attention and praise through reconditioning. Studies which have paired adult social stimuli with massive schedules of nonsocial reinforcement (e.g., edibles, toys) have shown enhancement of these social stimuli as reinforcers for children (Patterson, 1965; Patterson et al., 1967; Wahler, Note 6).

This procedure is important in the parent training area as a treatment approach, and it is also important as a maintenance programming strategy. When a treatment procedure involving nonsocial reinforcers is terminated, supporting contingencies employing more naturally available reinforcers are required to maintain child behavior change. These contingencies can be provided by parental social behavior.

While effective as a maintenance strategy, this procedure has limitations as a strategy for promoting transfer. Carefully controlled training procedures which increase the reinforcement value of adult social stimuli may encourage stimulus control, and thus limit the effects to the training setting (cf., Lovaas et al., 1973). A solution to this problem may be to vary the conditions of training so that the social stimuli are associated with various primary reinforcers in a variety of different settings. Skinner (1953) suggested that such varied training occurs naturally in the development of conditioned reinforcers outside the laboratory, and results in the generalization of reinforcing properties to novel stimuli and situations. A thorough labo-

ratory analysis of generalized conditioned reinforcement is lacking at the present time (Nevin, 1973b). However, some evidence from applied interventions suggests that generalization effects may occur (Nolan, Mattis & Holliday, 1970), and further research is certainly warranted. Programming the generality of conditioned reinforcement by varying primary reinforcers and training settings could be easily accomplished within a parent training program.

In summary, the establishment of parental social stimuli as conditioned reinforcers is important to ensuring the maintenance of treatment effects following the termination of a parentally administered program employing nonsocial reinforcers. Long-term maintenance requires reprogramming the social environment, and an essential component of this process is the provision of lasting reinforcers. Some evidence suggests that the generality of adult social stimuli as conditioned reinforcers may be enhanced by pairing parental attention and praise with a number of primary reinforcers in different settings. This procedure requires further controlled investigation.

#### Schedules of Reinforcement

It was noted earlier that long-term behavioral maintenance requires supporting contingencies of reinforcement. Short-term maintenance, on the other hand, can be programmed to occur in the absence of supporting conditions, through manipulating the schedules of reinforcement provided during training. Often in applied interventions, short-term maintenance of

behavior change is all that is required for dormant or new contingencies to assume a supporting function. This is frequently the case, for example, when transfer of new behavior to an extra-treatment setting has occurred: potential dispensers of reinforcement (e.g., teachers) may need to observe a positive child behavior on several occasions before beginning to reinforce the behavior. Therefore, programming short-term behavioral maintenance is an important strategy for applied behavioral researchers.

The effects of different reinforcement schedules upon response maintenance have been extensively investigated in the animal learning literature (Ferster & Skinner, 1957; Nevin, 1973c). This literature indicates that employing intermittent reinforcement during training and fading reinforcement occasions near the end of training, substantially increase behavioral persistence in nontraining conditions. There is also evidence to suggest that reinforcing long pauses between responses may weaken stimulus control and thus encourage generalization (Haber & Kalish, 1963; Hearst, Koresko & Poppen, 1964). The extension of these findings to human subjects has not been well documented, but it appears that the patterns of human behavior generated by various reinforcement schedules are quite similar to those of animals (Marholin et al., 1976; Martin & Pear, 1978).

Koegel and Rincover (1977) reported an analysis of the effects of different reinforcement schedules upon the extratraining responding of six autistic boys. All boys were trained with continuous reinforcement (CRF) to

respond to instructions. For four of the boys, reinforcement was then progressively thinned to fixed ratio schedules of FR2 or FR5 (every second or every fifth response was reinforced). After training was concluded, transfer and maintenance were assessed in a different laboratory setting. All boys showed initial transfer, and maintenance was found to be directly related to the thinness of the schedule in effect at the end of training. Those boys trained only on CRF extinguished quickly, whereas those who were trained on FR5 continued responding for the longest time. Similar resistance to extinction in humans following training with intermittent reinforcement has been reported by Kazdin and Polster (1973).

Another aspect of reinforcement schedules which may be important for programming maintenance is the delay period between responding and reinforcement. In unprogrammed natural environments, conditions quite different from those of the laboratory prevail: not only are responses reinforced inconsistently (i.e., intermittently), but there is also nearly always a considerable delay before reinforcement occurs. If during training a child is taught to expect a delay before being rewarded for good behavior, the good behavior should be more durable under natural conditions. Two types of delay procedures have been used in training: delay between the response and contingent reinforcement (Schwartz & Hawkins, 1970) and delay between token reinforcement and exchange of tokens for backup reinforcers (O'Leary & Becker, 1967). Both of these procedures have proven effective in increasing

resistance to extinction in nontraining conditions .

The application of these procedures in programming the maintenance of child behavior change following parent training has not received sufficient attention . Several investigators have employed fading procedures in their work with parents (e.g. , Patterson et al. , 1972) , but only a few have discussed teaching parents to apply these procedures with their children (e.g. , LeBow , 1973) . Intermittent reinforcement , fading , and delayed reinforcement procedures should be basic components in parents' repertoires of behavioral skills .

In summary , the procedures of intermittent reinforcement , fading and delayed reinforcement all appear effective in producing resistance to extinction under nontraining conditions . Employing such procedures with children in their homes may increase the durability of their behavior in other settings , thus increasing the possibility of reinforcement in those settings . In this way , programming behavioral persistence may lead to long-term maintenance .

#### Self-Management

Much recent attention has been focused upon the role of cognitive events as mediating variables in human behavior . A good deal of this attention has centered around the phenomenon of self-management (or self-control) . In this context , self-management will be understood simply as the act of an individual controlling his or her own behavior by arranging relevant environ-

mental conditions (cf., Skinner, 1953). While most theorists are agreed that self-management skills are acquired during an individual's social learning history, opinion is widely divided concerning how such behavior is maintained in the absence of immediate external support. Two somewhat different paradigms have been proposed to explain the maintenance of self-controlling behaviors (Conway & Bucher, 1976). In the first, maintenance is attributed directly to the control of external stimulus events whose potency has been extended through responses classes and strengthened by intermittent reinforcement (Gewirtz, 1971; Stuart, 1972). In the second, cognitive processes such as self-monitoring and self-evaluation are invoked as mediators which extend the influence of maintaining external reinforcers (Bandura, 1976; Karoly, 1977). This results from accurate self-monitoring and positive self-evaluation becoming conditioned reinforcers through association in training with primary reinforcement (Bandura, 1971; Johnson & Martin, 1973). The question of which of these two explanatory models is most appropriate remains open at the present time: both can explain the empirical finding that individuals can be trained to effectively regulate their own behavior in the absence of supporting environmental contingencies.

Kanfer (1970) identified three basic components of self-control: self-monitoring, self-evaluation and self-administration of reinforcement. Most research in self-control has investigated the effects of training indi-

viduals to perform one or more of these activities. Broden, Hall and Mitts (1971) successfully employed self-monitoring to increase study behavior and decrease disruptive behavior in two eighth grade children. Drabman, Spitalnik and O'Leary (1973) taught disruptive children to accurately evaluate their social and academic behavior in the context of a classroom token program. Appropriate behavior change was maintained even when children's self-evaluation determined amounts of token reinforcement received. Several other studies have demonstrated that self-reinforcement for meeting self-imposed performance standards is as effective in producing behavior change as external reinforcement for meeting externally imposed standards (Bandura & Perloff, 1976; Felixbrod & O'Leary, 1973; Glynn, 1970; Lovitt & Curtiss, 1969).

Training which enables an individual to control his or her own behavior independently of current environmental conditions has important implications for the occurrence and maintenance of behavior change in nontraining conditions. Several investigators have proposed that behaviors which are self-evaluated and self-reinforced should be maintained longer under non-supportive conditions than behaviors which have always been reinforced by external agents (Bandura, 1971; Thoreson & Mahoney, 1974). In addition, it has been suggested that training in self-management should promote transfer to other settings by minimizing the importance of external stimuli in cueing behavior (Forehand & Atkeson, 1977; Stokes & Baer, 1977). The evidence supporting each of these assertions will be considered separately.

With respect to maintenance, several comparative studies have shown a small but consistent superiority of self-reinforced to externally reinforced behaviors in resistance to extinction (Bolstad & Johnson, 1972; Johnson, 1970; Johnson & Martin, 1973). However, the maintenance effects produced by self-reinforcement in these studies were relatively short-lived. A number of other studies have reported maintenance of self-reinforced behaviors under no external reward conditions, but these studies did not compare self-reinforced with externally reinforced behaviors (Anderson, Fodor & Alpert, 1976; Drabman et al., 1973; Epstein & Goss, 1978; Glynn, Thomas & Shee, 1973; Thomas, 1976; Turkewitz, O'Leary & Ironsmith, 1975). Although most of these studies only reported relatively short-term maintenance data (Drabman et al., 1973; Turkewitz et al., 1975), several studies observed maintenance for periods of several months following self-management training (Epstein & Goss, 1978; Thomas, 1976).

All of these studies initially employed external reinforcement to produce child behavior change. Once change was effected, self-monitoring and self-evaluation functions were turned over to the children, with external reinforcement becoming contingent upon accurate reporting and honest self-evaluation. Eventually, monitoring by staff was faded out, and reinforcement for appropriate child behavior was completely self-determined. Glynn and Thomas (1974) introduced a variation on this procedure in which self-regulatory operations were introduced immediately following a baseline



phase, without training by staff in discriminating performance standards. They found that children could employ self-management procedures without prior external reinforcement for maintaining performance standards. However, this finding requires replication since several other studies suggest that children tend to increase reinforcement while decreasing performance standards unless shaping and fading procedures are employed (Kaufman & O'Leary, 1972; Santogrossi, O'Leary, Romanczyk & Kaufman, 1973).

Little evidence is available to document the effects of self-management training upon extratraining behavior change. Those studies which have been conducted have all examined transfer of training from a classroom with token contingencies supporting self-control to a classroom without contingencies (Anderson et al., 1976; Turkewitz et al., 1975). Anderson et al. (1976) observed improved academic behavior in the transfer classroom following training in self-evaluation of academic behavior in the token classroom. In this study, all children in the token class changed classrooms together, so stimulus control and/or peer reinforcement may have mediated transfer. Turkewitz et al. (1975) found no transfer of self-controlled behavior change to nontraining classrooms when the training class did not remain intact. It thus appears that there is little evidence for the efficacy of self-control procedures in producing transfer.

Virtually no studies in the parent training area have employed self-management procedures with children, although some have done so with

parents (Brown, Gamboa, Birkimer & Brown, 1976). Almost all teaching of self-control skills has been supervised by researchers in school settings, and little information is available concerning procedures which could be used by parents to teach self-control skills to their children. Such procedures could be useful to parents in programming maintenance of desired child behavior within the home setting, and could be easily implemented by conscientious parents in a home-based reinforcement system. The potential of this procedure for programming transfer to other settings, such as the schools, appears less promising.

Reference Notes

1. Padia, W.L. The consequences of model misidentification in the interrupted time-series experiment. Paper presented at the meeting of the American Educational Research Association, New York, 1977.
2. Eckelman, J.D. Practical issues in training parents as behavior therapists for their own children: A review of the literature. Unpublished manuscript, University of Manitoba, 1977.
3. Budd, K.S. Research issues in the generality of parent training. Paper presented at the meeting of the Association for the Advancement of Behavior Therapy, Atlanta, December, 1977.
4. Budd, K.S., Pinkston, E.M. & Green, D.R. An analysis of two parent-training packages for remediation of aggression in laboratory and home settings. Paper presented at the meeting of the American Psychological Association, Montreal, August, 1973.
5. Brown, W.G., Turnbough, D.P., Phillips, E.L., Fixsen, D.L. & Wolf, M.M. Achievement Place: The reduction of parental disapproved behaviors in the natural home by contingencies applied in a community-based residential group home. Paper presented at the meeting of the American Psychological Association, 1974.
6. Wahler, R.G. Behavior therapy with oppositional children: Attempts to increase their parents' reinforcement value. Paper presented at the meeting of the Southeastern Psychological Association, Atlanta, April, 1967.

References

- Albee, G.W. The relation of conceptual models of disturbed behavior to institutional and manpower requirements. In F.N. Arnhoff, E.A. Rubenstein & J.C. Speisman (Eds.), Manpower for mental health. Chicago: Aldine, 1969.
- Alexander, J.F. & Parsons, B.V. Short-term behavioral intervention with delinquent families: Impact on family process and recidivism. Journal of Abnormal Psychology, 1973, 81, 219-225.
- Anderson, L., Fodor, I. & Alpert, M. A comparison of methods for training self-control. Behavior Therapy, 1976, 7, 649-658.
- Atkeson, B.M. & Forehand, R. Home-based reinforcement: Programs designed to modify classroom behavior: A review and methods evaluation. Psychological Bulletin, 1979, 86, 1298-1308.
- Atthowe, J.M. Behavior innovation and persistence. American Psychologist, 1973, 28, 34-41.
- Ayllon, T., Garber, S & Pisor, K. The elimination of discipline problems through a combined home-school motivational system. Behavior Therapy, 1975, 6, 717-626.
- Baer, D.M., Peterson, R.F. & Sherman, J.A. The development of imitation by reinforcing behavioral similarity to a model. Journal of the Experimental Analysis of Behavior, 1967, 10, 405-416.
- Baer, D.M. & Wolf, M.M. The entry into natural communities of reinforcement. In R. Ulrich, T. Stachnick & J. Mabry (Eds.), Control of human behavior from cure to prevention (Vol. 2). Glenview, Ill.: Scott, Foresman & Co., 1970.
- Baer, D.M. Wolf, M.M. & Risley, T.R. Some current dimensions of applied behavior analysis. Journal of Applied Behavior Analysis, 1968, 1, 91-97.
- Bailey, J.S., Wolf, M.M. & Phillips, E.L. Home-based reinforcement and the modification of pre-delinquents' classroom behavior. Journal of Applied Behavior Analysis, 1970, 3, 223-233.
- Bandura, W. Vicarious and self-reinforcement processes. In R. Glaser (Ed.), The nature of reinforcement. New York: Academic Press, 1971.

- Bandura, A. Self-reinforcement: Theoretical and methodological considerations. Behaviorism, 1976, 4, 135-155.
- Bandura, A. & Perloff, B. Relative efficacy of self-monitored and externally imposed reinforcement systems. Journal of Personality and Social Psychology, 1967, 7, 111-116.
- Bandura, A. & Walters, R.H. Social Learning and personality development. New York: Holt, Rinehart & Winston, 1963.
- Berkowitz, B.P. & Graziano, A.M. Training parents as behavior therapists' : A review. Behavior Research and Therapy, 1972, 10, 297-317.
- Bernal, M.E., Delfini, L.F., North, J.A. & Kreutzer, S.L. Comparison of boys' behaviors in homes and classrooms. In E.J. Mash, L.A. Hamerlynck & L.C. Handy (Eds.), Behavior modification and families. New York: Bruner/Mazel, 1976.
- Bernal, M.E., Williams, D.E., Miller, W.H. & Reagor, P.A. The use of videotape feedback and operant learning principles in training parents in management of deviant children. In R.E. Rubin, H. Fensterheim, J.D. Henderson & L.P. Ullman (Eds.), Advances in behavior therapy. New York: Academic Press, 1972.
- Bijou, S.W. & Baer, D.M. Child development: Readings in experimental analysis. New York: Appleton-Century-Crofts, 1967.
- Bijou, S.W. Peterson, R.F. & Ault, M.H. A method to integrate descriptive and experimental field studies at the level of data and empirical concepts. Journal of Applied Behavior Analysis, 1968, 1, 175-191.
- Bolstad, O.D. & Johnson, S.M. Self-regulation in the modification of disruptive classroom behavior. Journal of Applied Behavior Analysis, 1972, 5, 443-454.
- Bourne, L.E., Jr. Knowing and using concepts. Psychological Review, 1970, 77, 546-556.
- Bower, C.P., Padia, W.L. & Glass, G.V. TMS: Two Fortran IV programs for analysis of time-series experiments. Boulder, Colo.: Laboratory of Educational Research, University of Colorado, 1974.

- Broden, M., Hall, R.V. & Mitts, G. The effect of self-recording on the classroom behavior of two eighth-grade students. Journal of Applied Behavior Analysis, 1971, 4, 191-199.
- Brown, J.H., Gamboa, A.M., Birkimer, J. & Brown, R. Some possible effects of parent self-control training on parent-child interactions. In E.J. Mash, L.C. Handy & L.A. Hamerlynck (Eds.), Behavior modification approaches to parenting. New York: Bruner/Mazel, 1976.
- Bucher, B. Some variables affecting children's compliance with instructions. Journal of Experimental Child Psychology, 1973, 15, 10-21.
- Bucher, B. & Reaume, J. Generalization of reinforcement effects in a token program in the home. Behavior Modification, 1979, 3, 63-72.
- Buell, J., Stoddard, P., Harris, F.R. & Baer, D.M. Collateral social development accompanying reinforcement of outdoor play in a preschool child. Journal of Applied Behavior Analysis, 1968, 1, 167-173.
- Cantor, N.L. & Gelfand, D.M. Effects of responsiveness and sex of children on adults' behavior. Child Development, 1977, 48, 232-238.
- Christopherson, E.R., Barnard, J.D., Ford, D. & Wolf, M.M. The family training program: Improving parent-child interaction patterns. In E.J. Mash, L.C. Handy & L.A. Hamerlynck (Eds.), Behavior modification approaches to parenting. New York: Bruner/Mazel, 1976.
- Cohen, S., Kegworth, J., Kleiner, R. & Libert, J. The support of school behaviors by home-based reinforcement via parent-child contingency contracts. In E. Ramp & B. Hopkins (Eds.), A new direction for education: Behavior analysis. Lawrence: University of Kansas, 1971.
- Coleman, R.G. A procedure for fading from experimenter-school-based to parent-home-based control of classroom behavior. Journal of School Psychology, 1973, 11, 71-79.

- Conway, J.B. & Bucher, B.D. Transfer and maintenance of behavior change in children: A review and suggestions. In E.J. Mash, L.A. Hamerlynck & L.C. Handy (Eds.), Behavior modification and families. New York: Brunner/Mazel, 1976.
- Cowen, E.L., Trost, M.A., Lorion, R.P., Dorr, D., Izzo, L.D. & Isaacson. New directions in school mental health. New York: Behavioral Publications, Inc., 1975.
- Craigie, F.C. & Garcia, E.E. Effects of child behavior change on teacher verbal behavior and rating of student behavior. Journal of Applied Behavior Analysis, 1978, 11, 308.
- Deese, J. & Hulse, S.H. The psychology of learning (Third ed.). New York: McGraw-Hill, 1967.
- Drabman, R.S. & Lahey, B.B. Feedback in classroom behavior modification: Effects in the target and her classmates. Journal of Applied Behavior Analysis, 1974, 7, 591-598.
- Drabman, R.S., Spitalnik, R. & O'Leary, K.D. Teaching self-control to disruptive children. Journal of Abnormal Psychology, 1973, 82, 10-16.
- Emshoff, J.C., Redd, W.T. & Davidson, W.S., II. Generalization training and the transfer of treatment effects with delinquent adolescents. Journal of Behavior Therapy and Experimental Psychiatry, 1976, 7, 141-144.
- Epstein, R. & Goss, C.M. A self-control procedure for the maintenance of nondisruptive behavior in an elementary school child. Behavior Therapy, 1978, 9, 109-117.
- Felixbrod, J.J. & O'Leary, K.D. Effects of reinforcement on children's academic behavior as a function of self-determined and externally imposed contingencies. Journal of Applied Behavior Analysis, 1973, 6, 241-250.
- Ferber, H., Keeley, S.M. & Shemberg, K.M. Training parents in behavior modification: Outcome of and problems encountered in a program after Patterson's work. Behavior Therapy, 1974, 5, 415-419.
- Ferster, C.B. Positive reinforcement and behavioral development of autistic children. Child Development, 1961, 32, 437-456.
- Ferster, C.B. & Skinner, B.F. Schedules of reinforcement. New York: Appleton, 1957.
- Forehand, R. Child noncompliance to parental requests: Behavioral analysis and treatment. In M. Hersen, R.M. Eisler & P.M. Miller (Eds.) Progress in behavior modification (Vol. 5). New York: Academic Press, 1977.

- Forehand, R. & Atkeson, B.M. Generality of treatment effects with parents as therapists: A review of assessment and implementation procedures. Behavior Therapy, 1977, 8, 575-593.
- Forehand, R. & King, H.E. Noncompliant children: Effects of parent training on behavior and attitude change. Behavior Modification, 1977, 1, 93-108.
- Garcia, E., Baer, D.M. & Firestone, I. The development of generalized imitation within topographically determined boundaries. Journal of Applied Behavior Analysis, 1971, 4, 101-112.
- Gardner, H.L., Forehand, R & Roberts, M. Time-out with children: effects of an explanation and brief parent training on child and parent behaviors. Journal of Abnormal Child Psychology, 1976, 4, 277-288.
- Gesten, E. A health resources inventory: The development of a measure of the personal and social competence of primary-grade children. Journal of Consulting and Clinical Psychology, 1976, 44, 775-786.
- Gewirtz, J.L. The roles of overt responding and extrinsic reinforcement in "self-" and "vicarious-reinforcement" phenomena and in "observational learning" and imitation. In R. Glaser (Ed.), The nature of reinforcement. New York: Academic Press, 1971.
- Glass, G.V., Willson, V.L. & Gottman, J.M. The design and analysis of time-series experiments. Boulder, Colo.: Associated University Press, 1974.
- Glidewell, J. Priorities for psychologists in community mental health. In Issues in community psychology and preventative mental health. New York: Behavioral Publications, 1971.
- Glogower, R. & Sloop, E.W. Two strategies of group training parents as effective behavior modifiers. Behavior Therapy, 1976, 7, 177-184.
- Glynn, E.L. Classroom application of self-determined reinforcement. Journal of Applied Behavior Analysis, 1970, 3, 123-132.
- Glynn, E.L. & Thomas, J.D. Effect of cueing on self-control of classroom behavior. Journal of Applied Behavior Analysis, 1974, 7, 299-306.



- Glynn, E.L., Thomas, J.D. & Shee, S. Behavioral self-control of on-task behavior in an elementary classroom. Journal of Applied Behavior Analysis, 1973, 6, 105-113.
- Goocher, B.E. & Grove, D.N. A model for training parents to manage their family systems using multiple data sources as measures of parent effectiveness. In E.J. Mash, L.C. Handy & L.A. Hamerlynck (Eds.), Behavior modification approaches to parenting. New York: Bruner/Mazel, 1976.
- Graubard, P.S., Rosenberg, H. & Miller, M.B. Student applications of behavior modification to teachers and environments or ecological approaches to social deviancy. In E.A. Ramp & B.L. Hopkins (Eds.), A new direction for education: Behavior analysis. Lawrence, Kansas: Support and Development Center for Follow Through, 1971, 80-101.
- Graziano, A.M. Parents as behavior therapists. In M. Hersen, R.M. Eisler & P.M. Miller (Eds.), Progress in behavior modification (Vol. 4). New York: Academic Press, 1977.
- Guernsey, B.G. (Ed.) Psychotherapeutic agents: New roles for non-professionals, parents and teachers. New York: Holt, Rinehart & Winston, 1969.
- Haber, A. & Kalish, H.I. Prediction of discrimination from generalization after variations in schedule of reinforcement. Science, 1963, 142, 412-413.
- Hall, R.V., Axelrod, S., Tyler, L., Grief, E., Jones, R.C. & Robertson, R. Modification of behavior problems in the home with a parent as observer and experimenter. Journal of Applied Behavior Analysis, 1972, 5, 53-64.
- Hall, R.V., Lund, D. & Jackson, D. Effects of teacher attention on study behavior. Journal of Applied Behavior Analysis, 1968, 1, 1-12.
- Hawkins, R.P. It's time we taught the young how to be good parents (and don't we wish we'd started a long time ago). Psychology Today, 1972, 6, 28.

- Hawkins, R.P., Peterson, R.F., Schweid, E. & Bijou, S.W.  
Behavior therapy in the home: Amelioration of problem parent-child relations with the parent in a therapeutic role. Journal of Experimental Child Psychology, 1966, 4, 99-107.
- Hawkins, R.P. Slayter, D.J. & Smith, C.D. Modification of achievement by a simple technique invoking parents and teachers. In M.B. Harris (Ed.), Classroom uses of behavior modification. Columbus, Ohio: Charles E. Merrill, 1972.
- Hay, L.F., Nelson, R.O & Hay, W.M. The use of teachers as behavioral observers. Journal of Applied Behavior Analysis, 1977, 10, 345-348.
- Hays, W.L. Statistics for the social sciences (Second Ed.). New York: Holt, Rinehart & Winston, 1973.
- Hearst, E., Koresko, M.B. & Poppen, R. Stimulus generalization and the response-reinforcement contingency. Journal of the Experimental Analysis of Behavior, 1964, 7, 369-380.
- Heaton, R.C., Safer, D.J., Allen, R.P., Spumato, N.C. & Prumo, F.M. A motivational environment for behaviorally deviant junior high school students. Journal of Abnormal Child Psychology, 1976, 4, 263-275.
- Herbert, E.W. & Baer, D.M. Training parents as behavior modifiers: Self-recording of contingent attention. Journal of Applied Behavior Analysis, 1972, 5, 139-149.
- Herman, S.H. & Tramontana, J. Instructions and group versus individual reinforcement in modifying disruptive group behavior. Journal of Applied Behavior Analysis, 1971, 4, 113-120.
- Johnson, S.M. Self-reinforcement vs. external reinforcement in behavior modification with children. Developmental Psychology, 1970, 3, 148-149.
- Johnson, S.M., Bolstad, O.D. & Lobitz, G.K. Generalization and contrast phenomenon in behavior modification with children. In E.J. Mash, L.A. Hamerlynck & L.C. Handy (Eds.) Behavior modification and families. New York: Bruner/Mazel, 1976.

- Johnson, S.M. & Brown, R.A. Producing behavior change in parents of disturbed children. Journal of Child Psychology and Psychiatry, 1969, 10, 107-121.
- Johnson, S.M. & Christensen, A. Multiple criteria follow-up of behavior modification with families. Journal of Abnormal Child Psychology, 1975, 3, 135-154.
- Johnson, S.M. & Katz, R.C. Using parents as change agents for their own children: A review. Journal of Child Psychology and Psychiatry, 1973, 14, 181-200.
- Johnson, S.M. & Martin, S. Developing self-evaluation as a conditioned reinforcer. In B. Ashem & E.G. Poser (Eds.), Behavior modification with children. New York: Pergamon, 1973.
- Johnston, J.M. & Johnston, G.T. Modification of consonant speech-sound articulation in young children. Journal of Applied Behavior Analysis, 1972, 5, 233-246.
- Jones, R.R., Vaught, R.S. & Weinrott, M. Time-series analysis in operant research. Journal of Applied Behavior Analysis, 1977, 10, 151-166.
- Jones, R.R., Weinrott, M.R. & Vaught, R.S. Effects of serial dependency on the agreement between visual and statistical inference. Journal of Applied Behavior Analysis, 1978, 11, 277-283.
- Kanfer, F.H. Self-regulation: Research issues and speculation. In C. Neuringer & J.L. Michael (Eds.), Behavior modification in clinical psychology. New York: Appleton-Century-Crofts, 1970.
- Karoly, P. Behavioral self-management in children: Concepts, methods, issues and directions. In M. Hersen, R.M. Eisler & P.M. Miller (Eds.), Progress in behavior modification (Vol. 5). New York: Academic Press, 1977.
- Karraker, R.J. Increasing academic performance through home-managed contingency programs. Journal of School Psychology, 1972, 10, 173-179.

- Kaufman, K.F. & O'Leary, K.D. Reward, cost, and self-evaluation procedures for disruptive adolescents in a psychiatric hospital school. Journal of Applied Behavior Analysis, 1972, 5, 293-309.
- Kazdin, A.E. Time out for some considerations on punishment. American Psychologist, 1973, 28, 939-941.
- Kazdin, A.E. Statistical analyses for single-case experimental designs. In M. Hersen & D.H. Barlow (Eds.), Single case experimental designs. New York: Pergamon, 1976.
- Kazdin, A.E. Behavior modification in applied settings. Homewood, Illinois: The Dorsey Press, 1980.
- Kazdin, A.E. & Polster, R. Intermittent token reinforcement and response maintenance in extinction. Behavior Therapy, 1973, 4, 386-391.
- Keeley, S.M., Shemberg, K.M. & Cargonell, J. Operant clinical intervention: Behavior management or beyond? Where are the data? Behavior Therapy, 1976, 7, 292-305.
- Klein, S.S. Student influence on teacher behavior. American Education Research Journal, 1971, 8, 403-421.
- Koegel, R.L. & Rincover, A. Research on the difference between generalization and maintenance in extra-therapy responding. Journal of Applied Behavior Analysis, 1977, 10, 1012.
- Kratochwill, T.R. & Wetzel, R.J. Observer agreement, credibility and judgement: Some considerations in presenting observer agreement data. Journal of Applied Behavior Analysis, 1977, 10, 133-139.
- Lahey, B.B., Gendrich, J.G., Gendrich, S.I., Schnelle, J.F., Gant, D.S. & McNees, M.P. An evaluation of daily report cards with minimal teacher and parent contact as an efficient method of classroom intervention. Behavior Modification, 1977, 1, 381-394.
- LeBow, M.D. The behavior modification process for parent-child therapy. The Family Coordinator, 1973, 22, 313-319.
- Lindsley, O.R. An experiment with parents handling behavior at home. Johnstone Bulletin, 1966, 9, 27-36.
- Lorion, R.P., Cowen, E.L. & Caldwell, R.A. Normative and parametric analyses of school maladjustment. American Journal of Community Psychology, 1975, 3, 291-301.

- Lovaas, O.E., Koegel, R., Simmons, J.Q. & Long, J.S. Some generalization and follow-up measures on autistic children in behavior therapy. Journal of Applied Behavior Analysis, 1973, 6, 131-164.
- Lovitt, T.C. & Curtiss, K.A. Academic response rate as a function of teacher and self-imposed contingencies. Journal of Applied Behavior Analysis, 1969, 2, 49-53.
- Marholin, D., II, Siegel, L.J. & Phillips, D. Treatment and transfer: A search for empirical procedures. In M. Hersen, R.M. Eisler, & P.M. Miller (Eds.), Progress in behavior modification (Vol. 3). New York: Academic Press, 1976.
- Martin, B. Brief family intervention: Effectiveness and the importance of including the father. Journal of Consulting and Clinical Psychology, 1977, 45, 1002-1010.
- Martin, G.L. & Pear, J.J. Behavior modification: What it is and how to do it. Englewood Cliffs, N.J.: Prentice-Hall, 1978.
- Mathis, H.I. Training a disturbed boy using the mother as therapist: A case study. Behavior Therapy, 1971, 2, 233-239.
- McArthur, M. & Hawkins, R.P. The modification of several behaviors of an emotionally disturbed child in a regular classroom. In R. Ulrich, T. Stachnik & J. Mabry (Eds.), Control of human behavior: Behavior modification in education (Vol. 3). Glenview, Ill.: Scott, Foresman & Co., 1975.
- McKenzie, H., Clark, M., Wolf, M., Kothera, R. & Benson, C. Behavior modification of children with learning disabilities using grades as tokens and allowances as back-up reinforcers. Exceptional Children, 1968, 43, 745-752.
- Miller, L.C. Louisville Behavior Check List for males 6 - 12 years of age. Psychological Reports, 1967, 21, 885-896.
- Miller, L.C., Hampe, E., Barrett, C.L. & Noble, H. Children's deviant behavior within the general population. Journal of Consulting and Clinical Psychology, 1971, 37, 16-22.

- Miller, L.C., Hampe, E., Barrett, C.L. & Noble, H. Test-retest reliability of parent ratings of children's deviant behavior. Psychological Reports, 1972, 31, 249-250.
- Miller, S.J. & Sloane, H.N. The generalization effects of parent training across stimulus settings. Journal of Applied Behavior Analysis, 1976, 9, 355-370.
- Nay, W.R. A systematic comparison of instructional techniques for parents. Behavior Therapy, 1975, 6, 14-21.
- Nevin, J.A. Stimulus control. In J.A. Nevin & G.S. Reynolds (Eds.), The study of behavior: Learning, motivation and instinct. Glenview, Ill.: Scott, Foresman & Co., 1973. (a)
- Nevin, J.A. Conditioned reinforcement. In J.A. Nevin & G.S. Reynolds (Eds.), The study of behavior: Learning, motivation and instinct. Glenview, Ill.: Scott, Foresman & Co., 1973. (b)
- Nevin, J.A. The maintenance of behavior. In J.A. Nevin & G.S. Reynolds (Eds.), The study of behavior: Learning, motivation and instinct. Glenview, Ill.: Scott, Foresman & Co., 1973. (c)
- Nolan, J.D., Mattis, P.R. & Holliday, R.C. Long-term effects of behavior therapy: A 12-month follow-up. Journal of Abnormal Psychology, 1970, 76, 88-92.
- O'Dell, S.L. Training parents in behavior modification: A review. Psychological Bulletin, 1974, 81, 418-433.
- O'Dell, S.L., Flynn, J. & Benlolo, L. A comparison of parent training techniques in child behavior modification. Journal of Behavior Therapy And Experimental Psychiatry, 1977, 8, 261-268.
- O'Leary, K.D. & Becker, W.C. Behavior modification of an adjustment class: A token reinforcement program. Exceptional Children, 1967, 33, 637-642.
- O'Leary, K.D. & O'Leary, S.G. (Eds.) Classroom management: The successful use of behavior modification. New York: Pergamon Press, 1977.

- Patterson, G.R. A learning theory approach to the treatment of the school phobic child. In L. Ullman & L. Krasner (Eds.), Case studies in behavior modification. New York: Holt, Rinehart & Winston, 1965.
- Patterson, G.R. Behavioral intervention procedures in the classroom and in the home. In A.E. Bergin & S.L. Garfield (Eds.), Handbook of psychotherapy and behavior change. New York: Wiley, 1971.
- Patterson, G.R. Interventions for boys with conduct problems: Multiple settings, treatments and criteria. Journal of Consulting and Clinical Psychology, 1974, 42, 471-481.
- Patterson, G.R. Living with children (Revised ed.) Champaign, Ill.: Research Press, 1976.
- Patterson, G.R. & Brodsky, M. Behavior modification for a child with multiple problem behaviors. Journal of Child Psychology and Psychiatry, 1966, 7, 277-295.
- Patterson, G.R., Cobb, J.A. & Ray, R.S. A social engineering technology for retraining the families of aggressive boys. In H.E. Adams & I.P. Unikel (Eds.), Issues and trends in behavior therapy. Springfield, Ill.: Charles C. Thomas, 1972.
- Patterson, G.R., McNeal, S., Hawkins, N. & Phelps, R. Reprogramming the social environment. Journal of Child Psychology and Psychiatry, 1967, 8, 181-195.
- Patterson, G.R. & Reid, J.B. Reciprocity and coercion: Two facets of social systems. In C. Neuringer & J. Michael (Eds.), Behavior modification in clinical psychology. New York: Appleton-Century-Crofts, 1970.
- Patterson, G.R. & Reid, J.B. Intervention for families of aggressive boys: A replication study. Behavior Research and Therapy, 1973, 11, 383-394.
- Patterson, G.R., Reid, J.B., Jones, R.R. & Conger, R. A social learning approach to family intervention. Volume 1: Families with aggressive children. Eugene, Oregon: Castalia, 1975.

- Peed, S., Roberts, M. & Forehand, R. Evaluation of the effectiveness of a standardized parent training program in altering the interaction of mothers and their noncompliant children. Behavior Modification, 1977, 1, 323-350.
- Rachman, G. Learning theory and child psychology: Therapeutic possibilities. Journal of Child Psychology and Psychiatry, 1962, 3, 149-163.
- Redd, W.H. Generalization of adult's stimulus control of children's behavior. Journal of Experimental Child Psychology, 1970, 9, 286-296.
- Reid, J.B. Reliability assessment of observational data: A possible methodological problem. Child Development, 1970, 41, 1143-1150.
- Rimm, R.C., Vernon, J.C. & Wise, M.J. Training parents of behaviorally disordered children in groups: A three year program evaluation. Behavior Therapy, 1975, 6, 378-387.
- Rincover, A. & Koegel, R.L. Setting generality and stimulus control in autistic children. Journal of Applied Behavior Analysis, 1975, 8, 345-246.
- Risley, T.R. & Wolf, M.M. Experimental manipulation of autistic behaviors and generalization into the home. In S.W. Bijou & D.M. Baer (Eds.), Child Development: Readings in experimental analysis. New York: Appleton-Century-Crofts, 1967.
- Sajwaj, T. Difficulties in the use of behavioral techniques by parents in changing child behavior. Journal of Nervous and Mental Disease, 1973, 156, 395-403.
- Sajwaj, T., Twardosz, S. & Burke, M. Side effects of extinction procedures in a remedial pre-school. Journal of Applied Behavior Analysis, 1972, 5, 163-175.
- Santogrossi, D.A., O'Leary, K.D., Romanczyk, R.G. & Kaufman, K.F. Self-evaluation by adolescents in a psychiatric hospital program. Journal of Applied Behavior Analysis, 1973, 6, 277-287.



- Schwartz, M.L. & Hawkins, R.P. Application of delayed reinforcement procedures to the behavior of an elementary school child. Journal of Applied Behavior Analysis, 1970, 3, 85-96.
- Schumaker, J.B., Hovell, M.F. & Sherman, J.A. An analysis of daily report cards and parent-managed privileges in the improvement of adolescents' classroom performance. Journal of Applied Behavior Analysis, 1977, 10, 449-464.
- Schumaker, J. & Sherman, J.A. Training generative verb usage by imitation and reinforcement procedures. Journal of Applied Behavior Analysis, 1970, 3, 85-96.
- Seymour, F.W. & Stokes, T.F. Self-recording in training girls to increase work and evoke staff praise in an institution for offenders. Journal of Applied Behavior Analysis, 1976, 9, 41-54.
- Sherman, T.M. & Cormier, W.H. An investigation of the influence of student behavior on teacher behavior. Journal of Applied Behavior Analysis, 1974, 7, 11-21.
- Skinner, B.F. Science and human behavior. New York: Macmillan, 1953.
- Stokes, T.F. & Baer, D.M. An implicit technology of generalization. Journal of Applied Behavior Analysis, 1977, 10, 349-367.
- Stokes, T.F., Baer, D.M. & Jackson, R.L. Programming the generalization of a greeting response in four retarded children. Journal of Applied Behavior Analysis, 1974, 7, 599-610.
- Stokes, T.F., Doud, C.L., Rowberry, T.G. & Baer, D.M. Peer facilitation of generalization in a preschool classroom. Journal of Abnormal Child Psychology, 1978, 6, 203-209.
- Stokes, T.F., Fowler, S.A. & Baer, D.M. Training preschool children to recruit natural communities of reinforcement. Journal of Applied Behavior Analysis, 1978, 11, 285-303.
- Stuart, R.B. Situational versus self-control. In R.D. Rubin, A.A. Lazarus, M. Fensterheim & C.M. Franks (Eds.), Advances in behavior therapy (Vol. 3). New York: Academic Press, 1972.
- Tavormina, J.B. Basic models of parent counseling: A review. Psychological Bulletin, 1974, 81, 827-835.
- Terrace, H.S. Stimulus control. In W.K. Honig (Ed.), Operant behavior: Areas of research and application. New York: Appleton-Century-Crofts, 1966.

- Tharp, R.G. & Wetzel, R.J. Behavior modification in the natural environment. New York: Academic Press, 1969.
- Thomas, J. Accuracy of self-assessment of on-task behavior by elementary school children. Journal of Applied Behavior Analysis; 1976, 9, 209-210.
- Thomas, J.D., Presland, I.E., Grant, M.D. & Glynn, T.L. Natural rates of teacher approval and disapproval in Grade 7 classrooms. Journal of Applied Behavior Analysis, 1978, 11, 91-94.
- Thoreson, C.E. & Mahoney, M.J. Behavioral self-control. New York: Holt, Rinehart, & Winston, 1974.
- Turkewitz, H., O'Leary, K.D. & Ironsmith, M. Generalization of appropriate behavior through self-control. Journal of Consulting and Clinical Psychology, 1975, 43, 577-583.
- Wahler, R.G. Oppositional children: A quest for parental reinforcement control. Journal of Applied Behavior Analysis, 1969, 2, 159-170. (a)
- Wahler, R.G. Setting generality: Some specific and general effects of child behavior therapy. Journal of Applied Behavior Analysis, 1969, 2, 239-246. (b)
- Wahler, R.G. Some structural aspects of deviant child behavior. Journal of Applied Behavior Analysis, 1975, 8, 27-42.
- Wahler, R.G. Deviant child behavior within the family: Developmental speculations and behavior change strategies. In H. Leitenberg (Ed.), Handbook of behavior modification and behavior therapy. New York: Prentice-Hall, 1976.
- Wahler, R.G., House, A.E. & Stambough, E.E. Ecological assessment of child problem behavior. New York: Pergamon, 1976.
- Wahler, R.G., Sperling, K.A., Thomas, M.R., Teeter, N.C. & Luper, H.L. The modification of childhood stuttering: Some response-reinforcement relationships. Journal of Experimental Child Psychology, 1970, 9, 411-428.
- Wahler, R.G., Winkel, G.H., Peterson, R.F. & Morrison, D.C. Mothers as behavior therapists for their own children. Behavior Research and Therapy, 1965, 3, 113-124.

- Walder, L.O., Cohen, S.I., Brieter, D.E., Daston, P.G., Hirsch, I.S. & Liebowitz, J.M. Teaching behavioral principles to parents of disturbed children. In B. Guerney (Ed.), Psychotherapeutic agents: New roles for non-professionals, parents, and teachers. New York: Holt, Rinehart, & Winston, 1969.
- Walker, H.M., Hops, H.H., & Johnson, S.M. Generalization and maintenance of classroom treatment effects. Behavior Therapy, 1975, 6, 188-200.
- Walter, H.I., & Gilmore, S.K. Placebo versus social learning effects in parent training procedures designed to alter the behavior of aggressive boys. Behavior Therapy, 1973, 4, 361-377.
- White, M.A. Natural rates of teacher approval and disapproval in the classroom. Journal of Applied Behavior Analysis, 1975, 8, 367-372.
- Williams, C.G. The elimination of tantrum behavior by extinction procedures. Journal of Abnormal and Social Psychology, 1959, 59, 269.
- Wiltz, N.A., & Patterson, G.R. An evaluation of parent training procedures designed to alter inappropriate aggressive behavior. Behavior Therapy, 1974, 5, 215-221.
- Woodworth, R.S., & Schlosberg, H. Experimental psychology. New York: Holt, Rinehart & Winston, 1954.
- Zielberger, J., Sampen, S.E., & Sloane, H.N. Modification of a child's behavior problems in the home with the mother as therapist. Journal of Applied Behavior Analysis, 1968, 1, 47-53.

**Appendix A**  
**Observational Data Scoring Form**

CHILD'S NAME \_\_\_\_\_

DATE \_\_\_\_\_

SCHOOL, TEACHER, & TIME \_\_\_\_\_

OBSERVER \_\_\_\_\_

IS THIS A RELIABILITY CHECK OBSERVATION? YES \_\_\_\_\_ NO \_\_\_\_\_

NAME OF OBSERVER BEING CHECKED \_\_\_\_\_

SUMMARY OF DATA

	T1	T2	T3	C	O	SS	SA	SN	Aa	SIa	Ac	SIc
TOTAL POSSIBLE INTERVALS												
RESPONSE FREQ.												
%												

	I+	I-	SA+	SA-	SC+	SC-
TOTAL POSSIBLE INTERVALS						
RESPONSE FREQ.						
%						

T1= \_\_\_\_\_ T2= \_\_\_\_\_ T3= \_\_\_\_\_

	T1	T2	T3	I+	I-	C	O	SS	SA	SN	Aa	SIa	SA+	SA-	Ac	SIc	SC+	SC-
1																		
2																		
3																		
4																		
5																		
6																		
7																		
8																		
9																		
0	T1	T2	T3	I+	I-	C	O	SS	SA	SN	Aa	SIa	SA+	SA-	Ac	SIc	SC+	SC-
1																		
2																		
3																		
4																		
5																		
6																		
7																		
8																		
9																		
0	T1	T2	T3	I+	I-	C	O	SS	SA	SN	Aa	SIa	SA+	SA-	Ac	SIc	SC+	SC-
1																		
2																		
3																		
4																		
5																		
6																		
7																		
8																		
9																		
0	T1	T2	T3	I+	I-	C	O	SS	SA	SN	Aa	SIa	SA+	SA-	Ac	SIc	SC+	SC-

	T1	T2	T3	I+	I-	C	O	SS	SA	SN	Aa	SIa	SA+	SA-	Ac	SIc	SC+	SC-
1																		
2																		
3																		
4																		
5																		
6																		
7																		
8																		
9																		
0	T1	T2	T3	I+	I-	C	O	SS	SA	SN	Aa	SIa	SA+	SA-	Ac	SIc	SC+	SC-
1																		
2																		
3																		
4																		
5																		
6																		
7																		
8																		
9																		
0	T1	T2	T3	I+	I-	C	O	SS	SA	SN	Aa	SIa	SA+	SA-	Ac	SIc	SC+	SC-
1																		
2																		
3																		
4																		
5																		
6																		
7																		
8																		
9																		
0	T1	T2	T3	I+	I-	C	O	SS	SA	SN	Aa	SIa	SA+	SA-	Ac	SIc	SC+	SC-

	T1	T2	T3	I+	I-	C	O	SS	SA	SN	Aa	SIa	SA+	SA-	Ac	SIc	SC+	SC-
1																		
2																		
3																		
4																		
5																		
6																		
7																		
8																		
9																		
0	T1	T2	T3	I+	I-	C	O	SS	SA	SN	Aa	SIa	SA+	SA-	Ac	SIc	SC+	SC-
1																		
2																		
3																		
4																		
5																		
6																		
7																		
8																		
9																		
0	T1	T2	T3	I+	I-	C	O	SS	SA	SN	Aa	SIa	SA+	SA-	Ac	SIc	SC+	SC-
1																		
2																		
3																		
4																		
5																		
6																		
7																		
8																		
9																		
0	T1	T2	T3	I+	I-	C	O	SS	SA	SN	Aa	SIa	SA+	SA-	Ac	SIc	SC+	SC-



	T1	T2	T3	I+	I-	C	O	SS	SA	SN	Aa	SIa	SA+	SA-	Ac	SIc	SC+	SC-
1																		
2																		
3																		
4																		
5																		
6																		
7																		
8																		
9																		
0	T1	T2	T3	I+	I-	C	O	SS	SA	SN	Aa	SIa	SA+	SA-	Ac	SIc	SC+	SC-
1																		
2																		
3																		
4																		
5																		
6																		
7																		
8																		
9																		
0	T1	T2	T3	I+	I-	C	O	SS	SA	SN	Aa	SIa	SA+	SA-	Ac	SIc	SC+	SC-
1																		
2																		
3																		
4																		
5																		
6																		
7																		
8																		
9																		
0	T1	T2	T3	I+	I-	C	O	SS	SA	SN	Aa	SIa	SA+	SA-	Ac	SIc	SC+	SC-

**Appendix B**  
**Classroom Adjustment Rating Scale**  
**(CARS)**



**Appendix C**  
**Health Resources Inventory**  
**(HRI)**

## Health Resources Inventory II

Child's Name \_\_\_\_\_ Date \_\_\_\_\_

School \_\_\_\_\_ Teacher's Name \_\_\_\_\_

Please rate each of the listed behaviors according to how well it describes the child

1 = not at all 2 = a little 3 = moderately well 4 = well 5 = very well

- |   |   |
|---|---|
| <input type="checkbox"/> functions well even with distractions                        | <input type="checkbox"/> works well without adult support                 |
| <input type="checkbox"/> feels good about himself or herself                          | <input type="checkbox"/> expresses ideas willingly                        |
| <input type="checkbox"/> applies learning to new situations                           | <input type="checkbox"/> carries out requests and directions responsibly  |
| <input type="checkbox"/> has a good sense of humour                                   | <input type="checkbox"/> uses his imagination well                        |
| <input type="checkbox"/> is interested in schoolwork                                  | <input type="checkbox"/> well liked by classmates                         |
| <input type="checkbox"/> shares things with others                                    | <input type="checkbox"/> is good in arithmetic                            |
| <input type="checkbox"/> is well-behaved in school                                    | <input type="checkbox"/> tries to help others                             |
| <input type="checkbox"/> is mature  | <input type="checkbox"/> is well-organized                                |
| <input type="checkbox"/> approaches new experiences confidently                       | <input type="checkbox"/> faces the pressures of competition well          |
| <input type="checkbox"/> is a happy child   | <input type="checkbox"/> has many friends                                 |
| <input type="checkbox"/> does original work   | <input type="checkbox"/> works up to potential                            |
| <input type="checkbox"/> can accept things not going his way                          | <input type="checkbox"/> thinks before acting                             |
| <input type="checkbox"/> is pleased with his accomplishments                          | <input type="checkbox"/> accepts legitimate imposed limits                |
| <input type="checkbox"/> defends his views under group pressure                       | <input type="checkbox"/> knows his or her strengths and weaknesses        |
| <input type="checkbox"/> mood is balanced and stable                                  | <input type="checkbox"/> adjusts well to changes in the classroom routine |
| <input type="checkbox"/> resolves peer problems on his own                            | <input type="checkbox"/> expresses needs and feelings appropriately       |
| <input type="checkbox"/> copes well with failure                                      | <input type="checkbox"/> accepts criticism well                           |
| <input type="checkbox"/> follows class rules  | <input type="checkbox"/> is a good reader                                 |
| <input type="checkbox"/> participates in class discussions                            | <input type="checkbox"/> is comfortable as a leader and follower          |
| <input type="checkbox"/> is able to question rules that seem unfair or unclear to him | <input type="checkbox"/> functions well in unstructured situations        |
| <input type="checkbox"/> uses teacher appropriately as resource                       | <input type="checkbox"/> is spontaneous                                   |
| <input type="checkbox"/> is affectionate toward others                                | <input type="checkbox"/> works well toward long-term goals                |
| <input type="checkbox"/> is generally relaxed   | <input type="checkbox"/> works for own satisfaction, not just rewards     |
| <input type="checkbox"/> is a self-starter  | <input type="checkbox"/> rarely requires restrictions or sanctions        |
| <input type="checkbox"/> plays enthusiastically                                       | <input type="checkbox"/> is polite and courteous                          |
| <input type="checkbox"/> completes his homework                                       |   |
| <input type="checkbox"/> has a lively interest in his environment                     |   |
| <input type="checkbox"/> anger, when displayed, is justified                          |   |
| <input type="checkbox"/> is trustworthy   |   |

Please specify any other strengths or competencies which you think we should be aware of: \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_

**Appendix D**  
**Louisville Behavior Checklist**  
**(LBCL)**

**LOUISVILLE BEHAVIOR CHECK LIST**  
FORM E2, AGES 7-12

7/2/79

© Lewis C. Miller, 1976

NAME OF CHILD \_\_\_\_\_  
 LAST FIRST MIDDLE  
 AGE \_\_\_\_\_ DATE OF BIRTH \_\_\_\_\_ TODAY'S DATE \_\_\_\_\_  
 MONTH DAY YEAR MONTH DAY YEAR  
 ADDRESS \_\_\_\_\_ PHONE \_\_\_\_\_  
 ST REET  
 CITY STATE ZIP CODE

ID \_\_\_\_\_

FORM FILLED OUT BY  
 (0) — No info (5) — Both parents  
 (1) — Mother (3) — Other, if other, what  
 (2) — Father relationship to child?  
 (4) — Self

Please give information requested in each section below by making a check mark or writing on the blank lines provided.

SEX OF CHILD (0) — No info (1) — Male (2) — Female	RACE (0) — No info (1) — Black (2) — Caucasian (3) — Oriental (4) — American Indian (5) — Mexican American (6) — Other, if other, what? _____	RELIGION (0) — No info (1) — Baptist (2) — Catholic (3) — Episcopalian (4) — Jewish (5) — Methodist (6) — Presbyterian (7) — Other (8) — None	CURRENT SCHOOL GRADE (0) — No info (7) — 7 (20) — Ungraded (8) — 8 (21) — Nursery (9) — 9 (22) — Kindergarten (10) — 10 (1) — 1 (11) — 11 (2) — 2 (12) — 12 (3) — 3 (13) — College (4) — 4 (14) — Vocational/Tech. (5) — 5 (15) — None (6) — 6	HOW MANY OLDER BROTHERS DOES CHILD HAVE? _____	HOW MANY OLDER BROTHERS LIVE WITH CHILD? _____
				HOW MANY YOUNGER BROTHERS DOES CHILD HAVE? _____	HOW MANY YOUNGER BROTHERS LIVE WITH CHILD? _____
				HOW MANY OLDER SISTERS DOES CHILD HAVE? _____	HOW MANY OLDER SISTERS LIVE WITH CHILD? _____
				HOW MANY YOUNGER SISTERS DOES CHILD HAVE? _____	HOW MANY YOUNGER SISTERS LIVE WITH CHILD? _____

**PARENT INFORMATION**

NAME(S) OF ADULT(S) (Parents or Guardians) with whom child is living NOW:

WOMAN (Mother) _____	NAME _____	AGE _____	OCCUPATION _____	
MAN (Father) _____	NAME _____	AGE _____	OCCUPATION _____	

ADULTS CHILD IS LIVING WITH ARE:

HOW MANY YEARS HAS CHILD  
LIVED WITH THESE ADULTS?

LAST YEAR OF SCHOOL COMPLETED BY  
ADULTS WITH WHOM CHILD IS LIVING NOW:

(0) — No information (1) — Own mother and father (2) — Own mother, no father (3) — Own mother & stepfather (4) — Own father, no mother (5) — Own father & stepmother (6) — Adoptive mother & father (7) — Adoptive mother, no father (8) — Foster parent(s) (9) — Other, if other, what relationship to child? _____	WOMAN (Mother)	MAN (Father)	WOMAN (Mother)	SCHOOL GRADE	MAN (Father)
	(0) — No information (1) — 1 year (2) — 2 years (3) — 3 years (4) — 4-6 years (5) — 7-9 years (6) — 10-12 years (7) — 13-15 years (8) — 16-18 years (9) — Under 1 year Other: _____	(0) — No information (1) — 1 year (2) — 2 years (3) — 3 years (4) — 4-6 years (5) — 7-9 years (6) — 10-12 years (7) — 13-15 years (8) — 16-18 years (9) — Under 1 year Other: _____	(0) — No information (1) — 1st-6th grade (2) — 7th-9th grade (3) — 10th-12th grade (4) — 1st-2nd college (5) — 3rd-4th college (6) — Postgraduate (7) — Vocational/Tech (8) — Other What? _____	(0) — No information (1) — \$ 1,000 - \$ 2,999 (2) — \$ 3,000 - \$ 5,999 (3) — \$ 6,000 - \$ 9,999 (4) — \$10,000 - \$14,999 (5) — \$15,000 - \$19,999 (6) — \$20,000 - \$29,999 (7) — \$30,000 - \$39,999 (8) — \$40,000 - \$49,999 (9) — Over \$50,000	

THE ADULTS WITH WHOM  
THE CHILD IS NOW LIVING ARE:

WOMAN (Mother)	MAN (Father)
(0) — No information	(0) —
(1) — Married	(1) —
(2) — Separated	(2) —
(3) — Divorced	(3) —
(4) — Widowed	(4) —
(5) — Never Married	(5) —
(6) — Other	(6) —
What? _____	
(7) — None present	(7) —

HAS THERE EVER BEEN A TIME IN THE CHILD'S  
LIFE WHEN THERE WAS NO MOTHER IN THE HOME?  
 Yes \_\_\_ No \_\_\_ If "Yes", during which years?  
 \_\_\_\_\_

HAS THERE EVER BEEN A TIME IN THE CHILD'S  
LIFE WHEN THERE WAS NO FATHER IN THE HOME?  
 Yes \_\_\_ No \_\_\_ If "Yes", during which years?  
 \_\_\_\_\_

FAMILY INCOME (Estimated)

(0) — No information
(1) — \$ 1,000 - \$ 2,999
(2) — \$ 3,000 - \$ 5,999
(3) — \$ 6,000 - \$ 9,999
(4) — \$10,000 - \$14,999
(5) — \$15,000 - \$19,999
(6) — \$20,000 - \$29,999
(7) — \$30,000 - \$39,999
(8) — \$40,000 - \$49,999
(9) — Over \$50,000

NCS Date-Reflex E 1591 54321

**DIRECTIONS:**

Below you will find statements often used by parents to describe children's behavior. Read each statement and decide if it describes your child. If it does, mark (T) TRUE; if not, mark (F) FALSE.

**NOTE:**

Use soft pencil only. Do not use ball point or felt tip pen. If it is necessary to change your mark, please erase thoroughly. It is important to mark EACH statement. If you are in doubt, check the answer which is most correct.

**EXAMPLE**

# A (True)	T	F
# B (False)	T	F

ID NUMBER		0	1	2	3	4	5	6	7	8	9
		0	1	2	3	4	5	6	7	8	9
		0	1	2	3	4	5	6	7	8	9
		0	1	2	3	4	5	6	7	8	9
		0	1	2	3	4	5	6	7	8	9
		0	1	2	3	4	5	6	7	8	9
		0	1	2	3	4	5	6	7	8	9
		0	1	2	3	4	5	6	7	8	9
		0	1	2	3	4	5	6	7	8	9
		0	1	2	3	4	5	6	7	8	9

- |   |  |  |
|---|--|--|
| <p>1. Cries easily . . . . .</p> <p>2. Whines and complains . . . . .</p> <p>3. Shy . . . . .</p> <p>4. Dependent; leans heavily on others . . . . .</p> <p>5. Generally considerate and able to share . . . . .</p> <p>6. Demands that parents do what wants done . . . . .</p> <p>7. Cruel with animals or people in a shocking way (sadistic) . . . . .</p> <p>8. Handwriting unusually poor . . . . .</p> <p>9. Finds it hard to talk with others . . . . .</p> <p>10. Wets the bed at night at least once a month . . . . .</p> <p>11. Feels inferior; says not as good as others . . . . .</p> <p>12. Constantly fighting or beating up others . . . . .</p> <p>13. Reads poorly . . . . .</p> <p>14. Afraid of school; has to be forced to attend . . . . .</p> <p>15. Has been unconscious for a period of five minutes or more during the past year . . . . .</p> <p>16. Tosses and turns in sleep, rolls, gets up often at night, etc. (poor or restless sleeper) . . . . .</p> <p>17. Frightened of using the toilet . . . . .</p> <p>18. Has temper tantrums; yells, screams, cries, kicks feet, over the least thing . . . . .</p> <p>19. Rushes off to do things before instructions are finished, "can't wait" (impulsive) . . . . .</p> <p>20. Has a severe physical handicap; partial or total loss of sight, hearing, speech, or limb; paralysis or weakness in muscle, chronic disease-heart, lung, kidney, etc. . . . .</p> <p>21. For Girls Only: Acts more like a boy (masculine)<br/>For Boys Only: Acts more like a girl (effeminate) . . . . .</p> <p>22. Afraid of being in cars, or trains, or airplanes, or elevators . . . . .</p> | <p>23. Wets clothes during the day . . . . .</p> <p>24. Nervous habits such as biting or picking fingernails, twisting hands, rubbing eyes, or pulling hair . . . . .</p> <p>25. Ambitious: desires to do well and get ahead . . . . .</p> <p>26. Poorly coordinated when doing things with the hands, such as writing or coloring . . . . .</p> <p>27. More involved with animals or things than people . . . . .</p> <p>28. Reacts too much to pain, even from slight aches or injuries . . . . .</p> <p>29. For Girls Only: Prefers to play with boys<br/>For Boys Only: Prefers to play with girls . . . . .</p> <p>30. Is absent from school repeatedly without permission (truant) . . . . .</p> <p>31. Withdrawn, aloof, unresponsive . . . . .</p> <p>32. Afraid of things such as the dark, thunderstorms, or being alone . . . . .</p> <p>33. Fails to carry out tasks at school or home . . . . .</p> <p>34. Is clumsy when walking, running, or playing games . . . . .</p> <p>35. Generally relaxed and able to concentrate . . . . .</p> <p>36. Shows unusual sexual curiosity (peeping, exploration, etc.) . . . . .</p> <p>37. Insists on doing the same meaningless thing over and over again, such as touching or never touching certain objects, or always washing hands (ritual behavior) . . . . .</p> <p>38. Sets fires . . . . .</p> <p>39. Uses poor judgment; will do or say anything . . . . .</p> <p>40. Cannot stop certain movements such as a twitching mouth or eye, jerking of the head (has a tic) . . . . .</p> <p>41. Preoccupied with fears of war, physical injury or death . . . . .</p> <p>42. Acts immature; is babyish . . . . .</p> <p>43. Gets upset when not the center of attention . . . . .</p> <p>44. Finds it hard to study . . . . .</p> | <p>45. Takes things easily in stride; not easily upset . . . . .</p> <p>46. Bullies or frightens others . . . . .</p> <p>47. Gets upset when routines are changed; insists on having everything the same . . . . .</p> <p>48. Hyperactive, some part of body is always moving; can't sit still . . . . .</p> <p>49. Sucks thumb or fingers . . . . .</p> <p>50. Has run away from home in the past year . . . . .</p> <p>51. Prefers to play with younger children although children own age are around . . . . .</p> <p>52. Demands to have someone to sleep with . . . . .</p> <p>53. Says "everyone picks on me" . . . . .</p> <p>54. Thinks or worries about sexual matters too much . . . . .</p> <p>55. Thoughts and ideas are sensible and understandable . . . . .</p> <p>56. Has an unusual number of accidents . . . . .</p> <p>57. Over-talkative, chatters constantly, interrupts others . . . . .</p> <p>58. Behind in school at least one grade . . . . .</p> <p>59. Refuses to play rough games . . . . .</p> <p>60. Behind in school at least two grades . . . . .</p> <p>61. Complains "nobody loves me" . . . . .</p> <p>62. Talks and acts silly . . . . .</p> <p>63. Seems dull; slow to catch on . . . . .</p> <p>64. Plays with bowel movements, smears, or willfully has B.M.'s where not supposed to have them . . . . .</p> <p>65. Steals outside the home . . . . .</p> <p>66. Picks at food, fusses, or demands special foods . . . . .</p> <p>67. Has difficulty in arithmetic . . . . .</p> |
|---|--|--|



- 68. Gags or vomits easily . . . . . T F
- 69. Fear of death; always worrying about dying . . . . . T F
- 70. Has epilepsy, blackout spells, convulsions, or staring spells . . . . . T F
- 71. Constantly complains that brothers and sisters are favored . . . . . T F
- 72. Talks frequently in sleep . . . . . T F
- 73. Doesn't care about the feelings of others . . . . . T F
- 74. Unusually slow at dressing, bathing, eating (dawdles) . . . . . T F
- 75. Is able to study and meet ordinary requirements of school . . . . . T F
- 76. Frequently rocks back and forth . . . . . T F
- 77. Recently involved in homosexual relations . . . . . T F
- 78. Cries when parents leave (separation problem) . . . . . T F
- 79. Seems tired, tends to lie around, shows little interest in doing things . . . . . T F
- 80. Often complains of at least one of the following: frequent stomach aches, rapid heart beat, inability to catch breath, feeling faint, dizziness, or inability to swallow . . . . . T F
- 81. Distractible, can't concentrate . . . . . T F
- 82. Behind in physical development, such as climbing, bikeriding, throwing a ball, etc. . . . . T F
- 83. Has physical sensations like numbness or things crawling on skin . . . . . T F
- 84. Does not participate in group activities, stays in background (said to be retiring) . . . . . T F
- 85. Enjoys being with children own age . . . . . T F
- 86. Exhausts self; constantly on the go, seldom relaxed . . . . . T F
- 87. Fearful, constantly afraid . . . . . T F
- 88. Hears voices, sees things, smells or tastes things that others cannot . . . . . T F
- 89. Has been sent to an institution for delinquents . . . . . T F
- 90. Has been taken to a probation officer or accused by police of committing a crime . . . . . T F
- 91. Moves constantly, "gets into everything," swarms all over (overactive) . . . . . T F
- 92. Demands special attention or fusses at bedtime . . . . . T F
- 93. Keeps on playing with one object for hours; cannot stop from doing the same thing over and over . . . . . T F
- 94. Is a pest in school - irritates teachers or playmates . . . . . T F
- 95. Is as mature as other children own age . . . . . T F
- 96. Not dependable; irresponsible . . . . . T F
- 97. Worries constantly or feels very guilty . . . . . T F
- 98. Doesn't speak as clearly as you would expect for age . . . . . T F
- 99. Gives in to others; does not take up for self . . . . . T F
- 100. Afraid of dirt or germs; will not use things that have been used by others, even after they have been washed . . . . . T F
- 101. Is disruptive; tendency to annoy and bother others . . . . . T F
- 102. Doesn't say "I" when talking about self, says "you go," or "he goes," when meaning "I go" . . . . . T F
- 103. Pushed and picked on, called names, laughed at by others . . . . . T F
- 104. Worries that parents may get hurt or sick or die . . . . . T F
- 105. Sexual interest and awareness normal for age . . . . . T F
- 106. Gets very upset when criticized or makes mistakes . . . . . T F
- 107. Swears or curses inappropriately . . . . . T F
- 108. Does not put things away in room, does not comb hair, does not dress neatly (untidy) . . . . . T F
- 109. Shows no shame or guilt after being caught . . . . . T F
- 110. Steals at home . . . . . T F
- 111. Argues about daily routines, such as putting on clothes, washing face and hands (argumentative) . . . . . T F
- 112. Frequently complains of headaches . . . . . T F
- 113. Lacks self-confidence . . . . . T F
- 114. On medication for emotional or behavior problems; tranquilizers, ritalin, phenobarbital, etc. . . . . T F
- 115. Has threatened or attempted suicide . . . . . T F
- 116. Recent sex play with neighborhood children . . . . . T F
- 117. Faints frequently . . . . . T F
- 118. Likes to play with matches or fire in dangerous places . . . . . T F
- 119. Frequently exposes genitals . . . . . T F
- 120. Says words that don't make sense; echoes you; talks or rhymes words without any sense to them . . . . . T F
- 121. Spells poorly for age . . . . . T F

ID NUMBER	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	
	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	
	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	
	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	
	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5
	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6
	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7	7
	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8	8
	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9	9

- 122. Argues and fusses with friends . . . . . T F
- 123. Refuses to get a shot or have a tooth filled . . . . . T F
- 124. Recent sexual relations with a person of the opposite sex . . . . . T F
- 125. Has a good sense of right and wrong . . . . . T F
- 126. Appears to be totally alone or secluded; becomes irritable when seclusiveness is disturbed . . . . . T F
- 127. Unusually afraid of social events or activities outside the home . . . . . T F
- 128. Defies parents; is unmanageable . . . . . T F
- 129. Prefers to be alone . . . . . T F
- 130. Soils underpants or bed clothing . . . . . T F
- 131. Complains of bad dreams or nightmares . . . . . T F
- 132. For Girls Only: Concerned with body changes: menstruation, breast development, rapid or slow growth, etc. ) T F
- For Boys Only: Concerned with body changes: voice, body hair, sexual discharges, rapid or slow growth, etc. ) T F
- 133. Is afraid of seeing or hearing something frightening at night . . . . . T F
- 134. Masturbates - plays with genitals openly . . . . . T F
- 135. Generally healthy . . . . . T F
- 136. Bright, but doesn't apply self . . . . . T F
- 137. Is overweight . . . . . T F
- 138. Depressed; nothing seems worthwhile . . . . . T F
- 139. Physically abusive; assaultive, hurts other children . . . . . T F
- 140. Does not try new situations, "hangs back" (considered by others as fearful or shy) . . . . . T F
- 141. Has trouble making and keeping friends . . . . . T F
- 142. Very much afraid of loud noises . . . . . T F
- 143. Is boisterous, rowdy . . . . . T F

Continued on next page.

LBCL E2, AGES 7-12

CHILD

DATE FORM COMPLETED		BIRTH DATE		RACE		GRADE	
MO	YR	MO	YR	SEX			
0	0	0	0	0	0	0	0
1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4
5	5	5	5	5	5	5	5
6	6	6	6	6	6	6	6
7	7	7	7	7	7	7	7
8	8	8	8	8	8	8	8
9	9	9	9	9	9	9	9

BORN		LIVING	
BRO	SIS	BRO	SIS
0	0	0	0
1	1	1	1
2	2	2	2
3	3	3	3
4	4	4	4
5	5	5	5
6	6	6	6
7	7	7	7
8	8	8	8
9	9	9	9

PARENTS		YEARS IN HOME		SCH		MAR ST		NO MO NO FA		AGE		OCC	
M	F	M	F	M	F	M	F	M	F	M	F	M	F
0	0	0	0	0	0	0	0	0	0	0	0	0	0
1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	2	2	2	2	2	2	2	2	2	2	2	2	2
3	3	3	3	3	3	3	3	3	3	3	3	3	3
4	4	4	4	4	4	4	4	4	4	4	4	4	4
5	5	5	5	5	5	5	5	5	5	5	5	5	5
6	6	6	6	6	6	6	6	6	6	6	6	6	6
7	7	7	7	7	7	7	7	7	7	7	7	7	7
8	8	8	8	8	8	8	8	8	8	8	8	8	8
9	9	9	9	9	9	9	9	9	9	9	9	9	9

NAME		INCOME	
A	A	0	0
B	B	1	1
C	C	2	2
D	D	3	3
E	E	4	4
F	F	5	5
G	G	6	6
H	H	7	7
I	I	8	8
J	J	9	9
K	K	0	0
L	L	1	1
M	M	2	2
N	N	3	3
O	O	4	4
P	P	5	5
Q	Q	6	6
R	R	7	7
S	S	8	8
T	T	9	9
U	U	0	0
V	V	1	1
W	W	2	2
X	X	3	3
Y	Y	4	4
Z	Z	5	5

Continued From Page 3

- |   |     |  |     |   |     |
|---|-----|--|-----|---|-----|
| 144. Destroys property willfully  | T F | 151. Lies or cheats  | T F | 158. Is a tattler - tale  | T F |
| 145. Expresses delight over the happiness of others                                       | T F | 152. Has asthma  | T F | 159. Bossy with friends   | T F |
| 146. Sticks pretty close to home  | T F | 153. Preoccupied with the body parts of others - like hands or breasts, etc. | T F | 160. Is disobedient; out of control of adults   | T F |
| 147. Excessively modest about body, in dressing and undressing, going to the toilet, etc. | T F | 154. Excessively afraid of taking tests, speaking or performing in public    | T F | 161. Has migraine or "sick" headaches   | T F |
| 148. Becomes "jittery," builds up tension, becomes "wound up"                             | T F | 155. Secure and confident - seldom worries                                   | T F | 162. Repeatedly in trouble with school authorities  | T F |
| 149. Daydreams excessively; gets lost in own thoughts                                     | T F | 156. Can't talk - only grunts, points, or screams                            | T F | 163. Is always constipated; needs repeated laxatives or enemas                              | T F |
| 150. Has recently been involved in unacceptable sexual behavior.                          | T F | 157. Has frequent diarrhea for which the doctor has found no cause           | T F | 164. Has been hospitalized or placed in a special school for a mental or emotional disorder | T F |

**Appendix E**  
**Report Card**

DARREN

DATE: \_\_\_\_\_

SCHOOLWORK		OUT OF SEAT
5	VERY GOOD	5
4	GOOD	4
3	AVERAGE	3
2	POOR	2
1	VERY POOR	1

**Appendix F**  
**Summary Data for Ricky**

Appendix F1

Ricky: Correlations Among Observed School Behaviors and Report Card Ratings

	T1*	T2	T3	C	O	SS*	SA	SN*	Aa	SIa	Ac	SIc	I+	I-	SA+	SA-	SC+	SC-	NC	Cd1	Cd2
T1	1.0	-.07	.13	-.13	-.23	.09	-.27	.15	.60	.13	.42	-.22	.00	.12	.26	.11	-.20	.26	-.11	.45	-.63
T2		1.0	-.03	.15	.42	-.10	-.08	.17	.11	.16	-.17	-.10	.07	.06	.12	.25	-.13	-.10	.14	.07	.12
T3			1.0	.06	-.09	.18	-.12	-.08	.16	-.04	.34	.24	-.06	.07	.00	-.06	.28	-.12	.07	.03	-.26
C				1.0	.16	.45	-.18	-.30	.27	.27	.18	-.17	.02	-.25	.32	-.14	-.12	-.24	.15	.41	.08
O					1.0	-.37	-.21	.58	-.11	.01	.09	-.13	-.03	.03	-.21	.44	-.10	-.18	.30	-.19	.18
SS						1.0	-.47	-.59	.31	.31	-.04	.27	.00	-.20	.43	-.34	.26	.09	.03	.52	-.31
SA							1.0	-.43	-.30	-.20	-.14	-.05	.21	-.12	-.23	-.01	-.08	-.02	-.10	-.14	.40
SN								1.0	-.05	-.14	.17	-.24	-.19	.31	-.22	.36	-.20	-.08	.07	-.37	-.12
Aa									1.0	.35	.37	-.12	.01	-.19	.59	-.13	.08	.14	.02	.46	-.40
SIa										1.0	.15	.11	.03	-.07	.87	-.16	.13	-.06	.02	.42	.04
Ac											1.0	.08	-.02	-.07	.19	.14	.22	.11	-.07	.31	-.18
SIc												1.0	-.07	-.03	.06	-.04	.98	.04	-.08	.08	.08
I+													1.0	.11	-.03	.14	-.07	-.02	-.41	-.23	-.05
I-														1.0	-.20	.25	-.04	-.15	.00	-.38	-.21
SA+															1.0	-.30	.08	-.01	-.06	.65	.06
SA-																1.0	-.02	.15	.14	-.23	-.02
SC+																	1.0	.05	-.10	.10	.10
SC-																		1.0	-.05	.35	-.09
NC																			1.0	-.11	.20
Cd1																				1.0	.10
Cd2																					1.0

T1 = out of seat  
 T2 = arguing  
 T3 = interrupting

Card 1 = schoolwork  
 Card 2 = out of seat

\* Behaviors targeted with report card

Appendix F<sub>2</sub>

## Ricky: Results of Time-series Analysis of School Observations

Behavior Category	Baseline vs. Teacher Rating				Teacher Rating vs. Home Card			
	Level		Slope <sup>a</sup>		Level		Slope	
	t	df <sup>b</sup>	t	df	t	df	t	df
T1: Out of seat	-1.59	10.0			0.05	29.0		
T2: Arguing	2.21*	10.0			-1.48	29.0		
T3: Interrupting	-1.86	7.8			-0.03	29.0		
Compliance	-0.85	9.0			1.00	29.0		
Opposition	1.12	3.3			-0.87	3.2		
Noncompliance ratio	-0.09	10.0			0.31	29.0		
Schoolwork	-0.77	10.0			1.23	29.0		
Attending	0.57	3.3			-0.35	3.3		
Nonattending	0.06	10.0			-0.45	3.3		
Approach to adult	0.10	10.0			-0.42	29.0		
Interact adult	-0.33	3.5			-0.56	29.0		
Approach to child	-1.28	10.0			0.46	29.0		
Interact child	0.02	10.0			1.25	19.7		
Instruction +	0.02	10.0			-0.86	29.0		
Instruction -	-0.14	10.0			-0.38	29.0		
Adult attention +	-1.50	10.0			1.55	29.0		
Adult attention -	0.67	10.0			-1.07	29.0		
Child attention +	-0.12	10.0			1.21	25.1		
Child attention -	0.51	10.0			-0.76	29.0		

\*  $p$  .05, two-tailed

\*\*  $p$  .025, two-tailed

<sup>a</sup> Tests for slope were conducted only when inspection suggested a trend.

<sup>b</sup> The unusual degrees of freedom values resulted from a correction employed with separate variance estimate  $t$ -tests when sample variances were unequal.

**Appendix G**  
**Summary Data for Michael**



Appendix G1

Michael: Correlations Among Observed School Behaviors and Report Card Ratings

	T1	T2*	T3*	C	O	SS	SA	SN	Aa	SIa	Ac	SIc	I+	I-	SA+	SA-	SC+	SC-	NC	Cd1	Cd2
T1	1.0	.18	.08	.25	.02	.07	.14	.04	-.02	-.27	.02	-.03	-.17	-.08	-.14	.15	-.08	.29	-.08	-.20	-.38
T2		1.0	-.27	.21	.58	-.16	-.44	.36	-.25	.14	-.34	-.06	.06	-.16	-.22	-.11	-.23	-.14	.31	-.56	-.42
T3			1.0	-.08	-.03	.05	-.13	.06	-.33	.10	.35	.29	.02	.13	-.16	.51	.28	.53	-.03	-.24	.02
C				1.0	-.06	.31	-.09	.01	-.14	-.09	-.07	.05	-.30	.19	-.08	-.05	.07	-.12	-.14	.15	.01
O					1.0	-.08	-.67	.55	-.12	.18	-.15	.17	.29	-.17	-.07	.02	.09	-.20	.49	-.51	-.15
SS						1.0	-.24	-.14	.10	-.02	-.11	.17	-.05	-.07	.14	-.13	.20	.03	-.12	.51	.09
SA							1.0	-.69	.20	-.38	.10	-.49	-.06	.00	.02	-.22	-.44	-.18	-.08	.34	.25
SN								1.0	-.17	-.23	.04	.45	.06	.19	-.15	.44	.35	.33	.04	-.62	-.30
Aa									1.0	.04	-.05	-.04	.45	.05	.77	.15	.08	-.04	-.16	.42	.18
SIa										1.0	-.16	.13	.09	.02	.35	.08	.16	.01	.05	.14	-.26
Ac											1.0	-.22	-.14	-.16	.04	-.04	.06	-.14	-.22	-.41	.61
SIc												1.0	-.10	.46	.03	.55	.91	.43	-.16	-.24	-.49
I+													1.0	-.17	.42	-.03	-.06	.01	.19	.14	.28
I-														1.0	.05	.53	.36	.30	-.18	-.14	-.31
SA+															1.0	.15	.17	.03	-.22	.40	.32
SA-																1.0	.44	.66	-.10	-.30	-.52
SC+																	1.0	.28	-.27	-.38	-.21
SC-																		1.0	-.31	.02	-.66
NC																			1.0	.07	.17
Cd1																				1.0	.17
Cd2																					1.0

T1 = interrupting

T2 = apart from class

T3 = aggression

Card 1 = apart from class

Card 2 = aggression

\* Behaviors targeted with report card

Appendix G<sub>2</sub>

## Michael: Results of Time-series Analysis of School Observations

Behavior Category	Baseline vs. Teacher Rating				Teacher Rating vs. Home Card			
	Level		Slope <sup>a</sup>		Level		Slope	
	t	df <sup>b</sup>	t	df	t	df	t	df
T1: Interrupting	0.48	12.0			-0.73	22.0		
T2: Apart from class	-1.12	12.0			-1.28	22.0		
T3: Aggression	1.48	12.0			-1.03	22.0		
Compliance	-0.13	12.0			0.14	22.0		
Opposition	0.77	12.0			1.81	3.2		
Noncompliance ratio	-1.92	12.0			-0.11	22.0		
Schoolwork	---	---			---	---		<sup>c</sup>
Attending	-0.92	12.0			1.12	22.0		
Nonattending	1.57	12.0			-0.92	3.3		
Approach to adult	-0.53	12.0			1.61	22.0		
Interact adult	-0.76	10.2			2.19*	22.0		
Approach to child	1.50	12.0			-2.66**	22.0		
Interact child	0.07	10.0	0.77	10.0	0.11	22.0		
Instruction +	0.28	12.0			-0.21	22.0		
Instruction -	0.69	3.5			1.65	22.0		
Adult attention +	0.30	12.0			0.78	22.0		
Adult attention -	1.38	12.0			0.90	22.0		
Child attention +	-0.38	10.0	0.32	10.0	-0.91	22.0		
Child attention -	1.48	12.0			1.08	22.0		

\*  $p$  .05, two-tailed

\*\*  $p$  .025, two-tailed

<sup>a</sup> Tests for slope were conducted only when inspection suggested a trend.

<sup>b</sup> The unusual degrees of freedom values resulted from a correction employed with separate variance estimate  $t$ -tests when sample variances were unequal.

<sup>c</sup> This behavior was not observed in this kindergarten classroom.

**Appendix H**  
**Summary Data for Darren**

Appendix H1

Darren: Correlations Among Observed School Behaviors and Report Card Ratings

	T1	T2*	T3	C	O	SS*	SA*	SN	Aa	SIa	Ac	SIc	I+	I-	SA+	SA-	SC+	SC-	NC	Cd1	Cd2	
<b>T1</b>	1.0	.25	.36	.05	.18	-.46	.05	.39	.34	.12	.52	.17	-.05	.06	-.08	.10	.25	-.10	-.17	.03	-.29	
<b>T2</b>		1.0	.37	.09	.65	-.14	-.47	.58	.02	.32	.40	.15	-.08	-.12	.18	-.01	.23	-.10	.12	-.17	.00	
<b>T3</b>			1.0	-.03	.34	.30	-.24	.40	.01	.10	.16	.24	-.18	.00	-.08	-.03	.25	-.22	.03	-.31	-.58	
<b>C</b>				1.0	.20	.35	-.24	-.10	-.06	.07	-.20	-.05	-.18	.08	-.05	-.21	-.07	.05	.00	.16	.21	
<b>O</b>					1.0	-.14	-.61	.71	.14	.15	.10	.38	-.28	-.10	-.07	-.19	.41	-.20	.29	-.05	-.16	
<b>SS</b>						1.0	-.45	-.50	-.18	-.19	-.27	-.51	.11	.01	.00	-.11	-.53	.38	-.06	.13	.52	
<b>SA</b>							1.0	-.55	-.13	-.14	-.19	-.08	.20	-.02	.21	-.02	-.11	-.06	-.20	-.01	-.12	
<b>SN</b>								1.0	.29	.31	.44	.56	-.29	.01	-.20	.12	.61	-.29	.24	-.12	-.42	
<b>Aa</b>									1.0	.02	.36	.03	-.02	.12	.10	.03	.09	-.10	-.22	.33	-.18	
<b>SIa</b>										1.0	.25	.06	.05	-.13	.83	-.01	.09	-.25	.21	.03	-.07	
<b>Ac</b>											1.0	.03	.10	.00	.23	.23	-.16	-.06	-.06	-.01	.03	
<b>SIc</b>												1.0	-.19	.19	-.16	.13	.99	-.35	.00	-.36	-.63	
<b>I+</b>													1.0	.34	-.01	.09	.17	.21	-.24	-.27	-.02	
<b>I-</b>														1.0	-.21	-.03	.20	-.23	-.18	-.24	.04	
<b>SA+</b>															1.0	-.05	.12	-.10	.92	.31	.19	
<b>SA-</b>																1.0	.14	-.05	.24	-.11	-.13	
<b>SC+</b>																	1.0	-.36	-.03	-.35	-.63	
<b>SC-</b>																		1.0	-.09	.36	.30	
<b>NC</b>																			1.0	.21	.18	
<b>Cd1</b>																				1.0	.26	
<b>Cd2</b>																						1.0

T1 = interrupting  
 T2 = out of seat  
 T3 = aggression

Card 1 = out of seat  
 Card 2 = schoolwork

\* Behaviors targeted with report card

Appendix H<sub>2</sub>

## Darren: Results of Time-series Analysis of School Observations

Behavior Category	Baseline vs. Teacher Rating				Teacher Rating vs. Home Card			
	Level		Slope <sup>a</sup>		Level		Slope	
	t	df <sup>b</sup>	t	df	t	df	t	df
T1: Interrupting	-2.06*	15.0			-0.67	25.0		
T2: Out of seat	-3.61**	11.6			0.63	25.0		
T3: Aggression	0.14	15.0			-4.57**	25.0		
Compliance	0.16	15.0			0.64	21.0		
Opposition	-0.53	15.0			-0.70	21.0		
Noncompliance ratio	0.98	15.0			1.20	21.0		
Schoolwork	0.22	15.0			1.94**	25.0		
Attending	0.47	15.0			0.06	25.0		
Nonattending	-0.86	15.0			-2.11*	25.0		
Approach to adult	-1.54	13.1			-0.62	25.0		
Interact adult	-2.37*	15.0			0.86	25.0		
Approach to child	-2.77**	15.0			-0.50	25.0		
Interact child	2.34*	15.0			-3.68**	25.0		
Instruction +	-1.54	15.0			1.09	25.0		
Instruction -	1.08	15.0			-0.42	25.0		
Adult attention +	1.94	15.0			1.39	25.0		
Adult attention -	-1.01	12.8			0.35	25.0		
Child attention +	1.79	15.0			-3.69**	25.0		
Child attention -	---	---			---	---		<sup>c</sup>

\*  $p$  .05, two-tailed

\*\*  $p$  .025, two-tailed

<sup>a</sup> Tests for slope were conducted only when inspection suggested a trend.

<sup>b</sup> The unusual degrees of freedom values resulted from a correction employed with separate variance estimate  $t$ -tests when sample variances were unequal.

<sup>c</sup> Analyses could not be performed on this behavior category because of its low frequency and variability.

Appendix I  
Summary Data for Robbie

Appendix 11

Robbie: Correlations Among Observed School Behaviors and Report Card Ratings

	T1	T2	T3*	C	O	SS*	SA	SN*	Aa	SIa	Ac	SIc	I+	I-	SA+	SA-	SC+	SC-	NC	Cd1
T1	1.0	.06	.13	-.55	-.29	.05	-.11	.05	.07	-.01	.11	-.02	-.08	--	-.04	.13	.01	.05	.16	-.05
T2		1.0	.16	-.03	.09	.10	-.26	.22	-.28	.17	.17	.17	-.12	--	.21	.05	.20	-.19	-.13	-.36
T3			1.0	-.24	.07	-.08	-.44	.63	-.34	-.30	.27	.68	-.32	--	-.28	.09	.73	.03	-.09	-.55
C				1.0	.38	.36	.06	-.26	-.03	-.18	.18	-.37	.43	--	-.20	-.20	-.41	-.09	-.05	.54
O					1.0	.25	-.34	.14	-.27	-.30	.04	-.14	-.03	--	-.28	-.17	.01	-.05	.48	.10
SS						1.0	-.58	-.24	-.45	-.33	.00	.12	.17	--	-.32	.20	.17	.00	.36	.43
SA							1.0	-.62	.81	.37	.19	-.31	.27	--	.37	-.11	-.38	-.08	-.10	.16
SN								1.0	-.57	-.15	.22	.23	-.49	--	-.16	-.08	.27	.08	-.11	-.48
Aa									1.0	-.09	.03	-.29	.20	--	-.03	-.11	-.30	.08	-.04	.30
SIa										1.0	.30	-.20	.12	--	.97	-.08	-.25	-.17	-.26	.04
Ac											1.0	.35	-.19	--	-.32	.00	.27	-.11	.10	-.29
SIc												1.0	-.12	--	.17	.09	.93	-.09	-.02	-.32
I+													1.0	--	-.16	.03	-.19	.08	-.08	.41
I-														--	--	--	--	--	--	--
SA+															1.0	-.09	-.21	-.11	-.23	.03
SA-																1.0	.12	-.06	-.07	.07
SC+																	1.0	.10	.12	-.41
SC-																		1.0	-.11	.13
NC																			1.0	-.12
Cd1																				1.0

T1 = interrupting

Card 1 = schoolwork

\* Behaviors targeted with report card

T2 = out of seat

T3 = off-task talking

Appendix I<sub>2</sub>

## Robbie: Results of Time-series Analysis of School Observations

Behavior Category	Baseline vs. Teacher Rating				Teacher Rating vs. Home Card			
	Level		Slope <sup>a</sup>		Level		Slope	
	t	df <sup>b</sup>	t	df	t	df	t	df
T1: Interrupting	0.61	18.0			0.13	23.0		
T2: Out of seat	0.45	18.0			0.44	23.0		
T3: Off-task talking	0.18	18.0			-0.40	23.0		
Compliance	-1.55	13.0			3.07**	10.3		
Opposition	0.67	2.0			0.03	11.0		
Noncompliance ratio	0.94	3.0			-0.43	13.0		
Schoolwork	1.10	18.0			-0.29	23.0		
Attending	-1.69	18.0			0.80	23.0		
Nonattending	0.57	18.0			-0.60	23.0		
Approach to adult	0.08	18.0			-0.36	23.0		
Interact adult	-3.07**	17.3			2.56**	22.3		
Approach to child	-0.12	18.0			-1.18	4.6		
Interact child	-1.10	16.0	-1.82	16.0	0.18	19.7		
Instruction +	-0.61	18.1			-0.42	23.0		
Instruction -	---	---			---	---	c	
Adult attention +	2.37*	17.2			-2.17*	17.9	c	
Adult attention -	---	---			---	---		
Child attention +	0.17	16.0	-2.85**	16.0	-0.45	23.0		
Child attention -	1.26	4.1			-1.09	4.2		

\*  $p$  .05, two-tailed\*\*  $p$  .025, two-tailed<sup>a</sup> Tests for slope were conducted only when inspection suggested a trend.<sup>b</sup> The unusual degrees of freedom values resulted from a correction employed with separate variance estimate  $t$ -tests when sample variances were unequal.<sup>c</sup> Analyses could not be performed on this behavior category because of its low frequency and variability.



**Appendix J**  
**Summary Data for Bryan**

Appendix J1

Bryan: Correlations Among Observed School Behaviors and Report Card Ratings

	T1*T2	T3	C	O	SS*	SA*	SN	Aa	SIa	Ac	SIc	I+	I-	SA+	SA-	SC+	SC-	NC	Cd1	Cd2	
T1	1.0	.01	.18	-.19	.11	-.26	.13	.10	.55	-.11	.07	-.19	.09	.11	.27	.57	-.19	-.02	.17	-.10	-.29
T2		1.0	-.07	-.21	.41	.19	-.47	.45	-.15	-.09	.23	.24	-.14	.23	-.10	.30	-.02	.28	.30	-.36	-.25
T3			1.0	-.01	-.01	.16	-.14	.14	-.10	-.02	-.05	.06	-.12	.16	-.09	.07	.00	-.01	.01	-.24	-.09
C				1.0	.18	-.05	.15	-.18	.06	.21	-.24	-.21	.51	-.06	.03	-.25	-.09	.05	-.25	.14	-.05
O					1.0	-.03	-.35	.51	.08	-.07	-.07	-.00	.10	-.07	-.02	.09	-.04	-.04	.44	-.36	-.29
SS						1.0	-.69	-.04	-.29	.04	-.19	.02	-.39	.34	.08	.06	.06	.07	-.02	-.09	.34
SA							1.0	.68	.27	.09	.03	-.12	.50	-.25	-.04	-.19	-.01	-.07	.22	.42	.10
SN								1.0	-.06	-.19	.19	.22	-.33	.05	-.02	.22	.03	.02	.32	-.52	-.55
Aa									1.0	-.04	-.01	-.08	.21	.03	.12	.29	-.11	.04	.10	.03	.07
SIa										1.0	.14	-.20	.12	.03	.36	.08	-.09	.00	.15	.29	.29
Ac											1.0	.30	.04	.25	-.05	.31	.14	.58	.11	-.19	-.35
SIc												1.0	-.10	.10	-.39	.08	.79	.05	.06	-.24	-.11
I+													1.0	-.13	.02	-.03	-.04	-.03	.00	.08	-.06
I-														1.0	.20	.41	.07	.46	.05	.01	.16
SA+															1.0	.21	-.31	.01	.35	.32	.20
SA-																1.0	-.07	.28	.34	-.04	-.01
SC+																	1.0	-.03	.01	-.20	-.10
SC-																		1.0	.06	-.02	-.09
NC																			1.0	-.38	-.16
Cd1																				1.0	.67
Cd2																					1.0

T1 = interrupting  
T2 = out of seat

Card 1 = interrupting  
Card 2 = schoolwork

\* Behaviors targeted with report card

Appendix J<sub>2</sub>

## Bryan: Results of Time-series Analysis of School Observations

Behavior Category	Baseline vs. Teacher Rating				Teacher Rating vs. Home Card			
	Level		Slope <sup>a</sup>		Level		Slope	
	t	df <sup>b</sup>	t	df	t	df	t	df
T1: Interrupting	0.04	22.0	-1.23	22.0	1.00	25.0		
T2: Out of seat	-0.67	22.0	1.92	22.0	-2.77**	23.0	-1.53	23.0
Compliance	0.99	24.0			-0.40	25.0		
Opposition	-0.06	24.0			-2.41**	25.0		
Noncompliance ratio	-1.56	24.0			-0.99	25.0		
Schoolwork	-0.12	24.0			0.39	23.0	1.02	23.0
Attending	-0.85	24.0			1.90	18.2		
Nonattending	1.35	24.0			-2.65**	23.0	-0.79	23.0
Approach to adult	-1.67	24.0			1.35	25.0		
Interact adult	0.90	4.3			-0.34	25.0		
Approach to child	-0.57	21.9			0.18	25.0		
Interact child	-0.49	24.0			1.14	25.0		
Instruction +	-0.50	24.0			0.36	25.0		
Instruction -	1.82	24.0			0.20	25.0		
Adult attention +	1.05	24.0			-0.05	25.0		
Adult attention -	-0.89	24.0			0.35	25.0		
Child attention +	0.71	24.0			0.24	25.0		
Child attention -	1.65	4.3			0.31	25.0		

\*  $p$  .05, two-tailed

\*\*  $p$  .025, two-tailed

<sup>a</sup> Tests for slope were conducted only when inspection suggested a trend.

<sup>b</sup> The unusual degrees of freedom values resulted from a correction employed with separate variance estimate  $t$ -tests when sample variances were unequal.