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**THE RELATIVE EFFECTIVENESS OF ALTERNATIVE
TREATMENTS FOR YOUNG CHILDREN WITH ATTENTION DEFICIT
HYPERACTIVITY DISORDER.**

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ABSTRACT

The objective of this study was to evaluate the relative effectiveness of pharmacological and behavioural interventions for young children diagnosed with Attention Deficit Hyperactivity Disorder. A randomised between-groups (2 x 2) double blind design was used to compare four treatment conditions: (a) 0.3mg/kg methylphenidate and parent training programme; (b) 0.3mg/kg methylphenidate and parent support group; (c) placebo medication and parent training; and (d) placebo medication and parent support group. Treatment duration was approximately 8 weeks. The 16 families who completed the study involved children aged from 3 to 5 years and their parents (typically their mothers). All children met stringent diagnostic criteria for Attention Deficit Hyperactivity Disorder and five children also met diagnostic criteria for Oppositional Defiant Disorder. Changes were assessed on parent and teacher rating scales that measured problems with attention, activity and impulse control and oppositional/defiant behaviours, direct observation during compliance and attention tasks, cognitive measures (Continuous Performance Task), and parenting and family factors. Analysis of results showed that either active treatment component (i.e., methylphenidate versus parent training) was not better than the other. The combination of active treatment components however led to significant improvements in teacher ratings of behaviour associated with Attention Deficit Hyperactivity Disorder and oppositional defiant behaviour with a similar, although generally statistically nonsignificant, trend in parent ratings. There was a significant and large degree of variability in performance on the cognitive measures and statistical analysis of group differences was not feasible; however, examination of individual data indicated increases in sustained attention and ability to inhibit behaviour for all children receiving

combined active treatments. During a compliance task, the number of repeat commands issued by mothers decreased and levels of child compliance increased significantly from pre- to post-intervention levels for the total sample, irrespective of treatment condition. The quality of family relationships also improved for the total sample. At post-intervention, 7 out of 16 children no longer met diagnostic criteria for Attention Deficit Hyperactivity Disorder and 2 out of 5 no longer met criteria for Oppositional Defiant Disorder. Several independent variables, such as gender, marital status, co-existing disorder, severity of behavioural problems, and level of parental warmth and family relationships, were found not to be predictive of post-intervention status. Findings are discussed within the framework of a transactional model. Analysis of the current data set indicates that successful outcomes for young children, at least in the short term, are more likely following combined treatments. Outcomes however may depend less upon the type of treatment per se than on whether treatment leads to changes in critical child-parent interactions, such as improvement in parental attitudes and positive attention towards the child.

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TABLE OF CONTENTS

INTRODUCTION.....	1
What is ADHD?.....	3
Prevalence of ADHD.....	4
Psychopharmacotherapy.....	5
Mechanism of action	5
Prevalence of stimulant medication use	6
Methodological considerations for psychopharmacotherapy	8
Pharmacological Interventions	9
Behavioural Interventions	16
Combined Interventions	20
Child, Parent and Family Characteristics	24
Coexisting child behaviour problems.....	25
Child cognitive ability	26
Influences on parenting	30
Contribution of other family variables	34
Present Study	35
Rationale for design of study	36
Measures used in the study	37
Medication level.....	38
Parent training programme	38
 METHOD	 44
Setting	44

Participants.. ..	44
Participant Selection	45
Inclusion criteria.....	46
Exclusion criteria	46
Participant selection and assessment process	47
Measures.....	51
Dependent Variables.....	64
Design	65
Treatment Group Assignment	65
General Procedure.....	66
Parent Training Programme	73
Parent Support Group	85
Final Design/Treatment Integrity.....	86
RESULTS.....	89
Sample Demographic Information.....	89
Participant Characteristics.....	92
Comparison with kindergarten children on Conner's Continuous Performance Test	92
Preliminary Data Analysis.....	93
Composition of intervention groups.....	93
Missing data.....	93
Interobserver reliability of behavioural observations.....	94
Data analysis of baseline rating scales	97
Clinical observations	98

Effect size	99
ANCOVA Results.....	99
MANCOVA Results	132
Extent of Normalisation due to Intervention.....	138
Predictive Variables	143
Pre-intervention measures	143
Post-intervention measures.....	146
Clinical Impressions.....	147
Parental Evaluation of Programme	150
Personal Evaluation of Programme	151
DISCUSSION	158
Treatment Integrity Issues	158
Participant Sample	160
Situational problems.....	161
Assessment issues	162
Nature of behavioural problems.....	163
Demographic and family variables	164
Child cognitive factors	166
Summary.....	167
Question 1: Is the Combination of Parent Training and Stimulant Medication Better Than Either Treatment Alone?.....	168
Changes in child behaviour	169
Changes in child cognitive ability.....	171
Changes in parental acceptance and family relationships	173

Changes in parent-child interactions during compliance and attention tasks...	173
Parental evaluation of programme	176
General conclusions	177
Question 2: Is Comprehensive Behavioural Intervention or Pharmacotherapy More Effective Than the Other?.....	179
Question 3: To What Extent is Behaviour Normalised by Treatment?	180
Question 4: What Factors May Influence the Outcome?.....	182
Theoretical Considerations.....	183
Theory versus practice.....	183
Service versus intervention.....	184
Interactional models	186
Classification models	189
Behavioural assessment model	191
Practical Considerations.....	194
REFERENCES.....	199
APPENDICES.....	229

LIST OF TABLES

Table 1: 2 x 2 Factorial design	65
Table 2: Details of children’s age and IQ and age of mothers	90
Table 3: Demographic data	91
Table 4: Interobserver agreement (%) for each category on compliance task	95
Table 5: Interobserver agreement (%) on scored-intervals (S-I) and Unscored- Intervals (U-I) for each category on attentional behaviour task	96
Table 6: Means for baseline administrations of ADHD Rating Scale and Rating Scale IV (A)–Parent versions.....	97
Table 7: Difference between pre-intervention and post-intervention scores and reliable change index for ADHD Rating Scale–Parent version	140
Table 8: Number of participants showing various degrees of change between pre and post measures on ADHD Rating Scale-Parent version for each intervention group (n).....	141
Table 9: Difference between pre-intervention and post-intervention scores and reliable change index for ADHD Rating Scale-Teacher version	142
Table 10: Number of participants showing various degrees of change between pre and post measures on ADHD Rating Scale-Teacher version for each intervention group (n).....	143
Table 11: Association between independent variables and post-intervention status.....	144
Table 12: Association between post-intervention measures and post-intervention status.....	146

LIST OF FIGURES

Figure 1: Flow chart of participant selection and assessment procedures	48
Figure 2: Flow chart of participant selection process	49
Figure 3: Administration of measures throughout the course of the study	50
Figure 4: Means for each group pre-, during- and post-intervention for first three measures on ADHD Rating Scale - Parent Version	101
Figure 5: Means for each group pre-, during- and post-intervention for remaining three measures on ADHD Rating Scale - Parent Version	102
Figure 6: Total score for each participant on ADHD Rating Scale-Parent Version.	103
Figure 7: Total number of problems for each participant on ADHD Rating Scale - Parent Version	103
Figure 8: Inattention score for each participant on ADHD Rating Scale - Parent Version.....	103
Figure 9: Number of inattention problems for each participant on ADHD Rating Scale - Parent Version	104
Figure 10: Hyperactivity-impulsivity score for each participant on ADHD Rating Scale - Parent Version	104
Figure 11: Number of hyperactivity-impulsivity problems for each participant on ADHD Rating Scale - Parent Version	104
Figure 12: Means for each group pre- and post-intervention for first three measures on ADHD Rating Scale - Teacher Version.....	106
Figure 13: Means for each group pre- and post-intervention for remaining three measures on ADHD Rating Scale - Teacher Version.....	107
Figure 14: Total score for each participant on ADHD Rating Scale - Teacher	

Version.....	108
Figure 15: Total number of problems for each participant on ADHD Rating Scale - Teacher Version	108
Figure 16: Inattention score for each participant on ADHD Rating Scale - Teacher Version.....	108
Figure 17: Number of inattention problems for each participant on ADHD Rating Scale - Teacher Version.....	109
Figure 18: Hyperactivity-impulsivity score for each participant on ADHD Rating Scale - Teacher Version.....	109
Figure 19: Number of hyperactivity-impulsivity problems for each participant on ADHD Rating Scale - Teacher Version.....	109
Figure 20: Means for each group pre-, during- and post-intervention for both measures on Rating Scale IV (A) - Parent Version.....	113
Figure 21: Means for each group pre- and post-intervention for both measures on Rating Scale IV (A) - Teacher Version	114
Figure 22: Means for each group pre- and post-intervention on Conners' Rating Scale - Parent Version	115
Figure 23: Means for each group pre- and post-intervention for Conners' Rating Scale - Teacher Version.....	116
Figure 24: Total score for each participant on Rating Scale IV(A) - Parent Version.....	117
Figure 25: Number of problems for each participant on Rating Scale IV(A) - Parent Version.....	117
Figure 26: Total score for each participant on Rating Scale IV (A) - Teacher Version.....	117

Figure 27: Number of problems for each participant on Rating Scale IV (A) - Teacher Version	118
Figure 28: Global Index T-score for each participant on Conners' Rating Scale - Parent Version.....	118
Figure 29: Oppositional subscale T-score for each participant on Conners' Rating Scale - Parent Version.....	118
Figure 30: Global Index T-score for each participant on Conners' Rating Scale - Teacher Version.....	119
Figure 31: Oppositional subscale T-score for each participant on Conners' Rating Scale - Teacher Version	119
Figure 32: Means for each group pre- and post-intervention on Conners' Kiddy Continuous Performance Test.....	120
Figure 33: Percent omissions for each participant on Conners' Kiddy Continuous Performance Test.....	121
Figure 34: Percent commissions for each participant on Conners' Kiddy Continuous Performance Test.....	121
Figure 35: Means for each group pre- and post-intervention for Parent Acceptance-Rejection Questionnaire and Family Environment Scale	123
Figure 36: Total score for each participant on the Parent Acceptance- Rejection Questionnaire	124
Figure 37: Relationship Index score for each participant on the Real Form of the Family Environment Scale.....	124
Figure 38: Means for each group pre- and post-intervention for behavioural observations of parent-child interactions-compliance task	126
Figure 39: Number of repeat commands for each participant on behavioural	

observations of parent-child interactions-compliance task	127
Figure 40: Percent child compliance for each participant on behavioural	
observations of parent-child interactions-compliance task	127
Figure 41: Percent child negative for each participant on behavioural observations	
of parent-child interactions-compliance task.....	127
Figure 42: Means for each group pre- and post-intervention on behavioural	
observations of parent-child interactions-attention task (1)	128
Figure 43: Means for each group pre- and post-intervention on behavioural	
observations of parent-child interactions-attention task (2)	129
Figure 44: Percent off-task behaviour for each participant on behavioural	
observations of parent-child interactions-attention task.....	130
Figure 45: Percent fidgeting behaviour for each participant on behavioural	
observations of parent-child interactions-attention task.....	130
Figure 46: Percent vocalising behaviour for each participant on behavioural	
observations of parent-child interactions-attention task.....	130
Figure 47: Percent playing with object for each participant on behavioural	
observations of parent-child interactions-attention task.....	131
Figure 48: Percent out of seat behaviour for each participant on behavioural	
observations of parent-child interactions-attention task.....	131
Figure 49: Total percent for all categories for each participant on behavioural	
observations of parent-child interactions-attention task.....	131

LIST OF APPENDICES

Appendix A: Information sheet (1).....	229
Appendix B: Information sheet (2).....	231
Appendix C: Family history/developmental questionnaire.....	233
Appendix D: Behavioural observations-coding sheets and behavioural categories .	237
Appendix E: Information sheets for parent/caregiver (1 & 2) Conners' K-CPT	243
Appendix F: Procedural reliability checklist.....	246
Appendix G: Programme evaluation form.....	249
Appendix H: Psychometric properties of tests and rating scales.....	252
Appendix I: Information presented in first session of parent training group	256
Appendix J: Handouts for parent group sessions	270
Appendix K: Correlation matrix for all dependent variables	301
Appendix L: ANCOVA results for intervention groups x dependent variables.....	305
Appendix M: MANCOVA results for treatment components x dependent variables.....	337
Appendix N: Difference in scores and degree of change on ADHD Rating Scale - Parent and Teacher versions.....	351

INTRODUCTION

A scan of title pages over the last five years of the ADHD Report, a bimonthly newsletter published by Guilford Press with research and commentary, leaves no doubt that Attention Deficit Hyperactivity Disorder (ADHD) is a broad and controversial topic. Titles include: *ADHD, hunting and evolution: "Just So" stories* (October, 1998), *ADHD and Conduct Disorder in adopted children* (August 1998), *Gene linked to ADHD verified* (June 1998), *ADHD and the military* (October, 1997), *ADHD on trial* (August 1997), *The prevalence of ADHD: Is it just a U.S. disorder?* (April 1998), *Is ADHD an excuse for antisocial actions?* (June 1997), *ADHD diagnosis in primary care pediatrics* (June 1996), *Must ADHD be an equal opportunity disorder?* (April 1996), *ADHD and life expectancy* (February 1996), *ADHD and IQ* (April 1995).

Even in the non-professional media, such as local newspapers and current affairs television programmes, or in popular science magazines, there appears to be plenty of interest in ADHD, variously called other names such as "Attention deficit disorder syndrome" or "dad deficit disorder". Many lay factions and professionals seem to want a stake in ADHD, its cause, outcomes, or treatment options. A central concern is the pathologising of children's behaviour. The mention of medication to treat behavioural problems in children is met with dismay by some parents: "I'm not interested in putting her on that (expletive deleted) junkie medication. Speed her up to slow her down, it doesn't make sense. I wouldn't take that stuff, so I'm not putting her on it." (Mother of 4-year-old girl). Similarly, the mention of behavioural

interventions for some parents is met with, "... but I came here to get help for my child..." (Mother of 3-year-old boy).

Clearly, there is an increasing need for public health services to evaluate the effectiveness of their intervention programmes, if only as a basis for reassuring the public that they are getting the best possible service. In some countries there has been widespread debate about the use of stimulant medication to treat young children with behavioural problems, this treatment approach being the most studied therapy in child psychiatry (Barkley, 1990). This debate has recently started in New Zealand (Matheson, 1996), however there is little research within our own (i.e., Aotearoa/New Zealand) culture about the use of this or any other type of treatment for these problems in young children. Although the behavioural pattern of high activity level, poor impulse control (difficulty inhibiting behaviour) and difficulty sustaining attention (staying on task) typically starts during the pre-school years (Barkley, 1990; Loeber, Keenan, Lahey, Green, & Thomas, 1993), most children are not clinically diagnosed until much later. Certainly the vast majority of research in this area has involved school-age children around 6 to 12 years, and by comparison very little research exists on younger children.

The present research looked at the effectiveness of some alternative interventions for young New Zealand children with problems of high activity levels, poor impulse control, and difficulty sustaining attention. There has been extensive research on these problems in the United States, particularly in school-aged children, and some of the literature is covered in this introduction along with relevant research with younger children. The first section includes basic information on the relevant diagnosis of ADHD. This is followed by a review of the two main interventions used

in this study, stimulant medication and parent training, and what is known about the use of these interventions, separately or combined, with young children. Research findings on factors that influence outcomes (e.g., coexisting problems, family factors, dose effects) are covered where relevant to this research. Methodological considerations in pharmacological studies and outcomes measures also are reviewed. The term “young children” is used to indicate a population of children aged less than six years to avoid confusion over the term “pre-schooler”. In New Zealand children generally start school when they are five years old, and therefore the term “pre-schooler” refers to children under that age, however in other countries such as the United States children often enter school at a later age.

What is ADHD?

The behavioural pattern of high activity level (hyperactivity), poor impulse control (impulsivity), and difficulty sustaining attention (inattention) has been referred to as ADHD. Current conceptualisations of what today is termed ADHD are based on a relatively long history. While descriptions of the associated behaviours have been generally consistent throughout this century (c.f., Still, 1902), views of the underlying cause and primary problems of ADHD have undergone various changes (see Barkley, 1998a, for review). ADHD has variously been viewed as due to problems in neurological dysfunction, brain damage and other organic problems, excessive motor activity or problems with attentional mechanisms. In the latest (fourth) edition of the *Diagnostic and Statistical Manual of Mental Disorders* (APA, 1994) problems with either attention alone or hyperactivity-impulsivity alone are sufficient for a clinical diagnosis of ADHD, assuming other criteria are met.

The diagnosis of ADHD is based on ratings of the extent to which activity level, ability to inhibit behaviour, and ability to sustain attention are considered to be maladaptive and inconsistent with developmental level. Based on *DSM-IV* criteria, problems in these areas must be present before 7 years of age, displayed in two or more setting (e.g., at school [or work] and at home) and significantly impair social, academic, or occupational functioning. In addition, they must not occur exclusively during the course of a Pervasive Developmental Disorder, Schizophrenia, or other Psychotic Disorder, and not be better accounted for by some other mental disorder (e.g., Mood Disorder, Anxiety Disorder, Dissociative Disorder, or a Personality Disorder).

“Whether or not ADHD actually exists is epiphenomenal” (Reid, 1996, p. 251). The perspective that there must be a proven medical cause to legitimise ADHD overlooks the very basis on which a diagnosis of ADHD is made, namely behaviour. Children are not given a diagnosis based on a biologic test, but receive it because their behaviour is perceived to be maladaptive (Reid, 1996, p.261). Nevertheless, differences in knowledge, attributions, and tolerance levels influence how a child’s behaviour will be construed and whether typical behaviour is seen by parents as problematic or problematic behaviour is seen as acceptable (Campbell, 1985). As indicated with ADHD and also with other “disorders”, judgements are made by establishing deviance in behaviour from social and cultural norms (Reid, Maag, & Vasa, 1993; Szasz, 1960).

Prevalence of ADHD. As would be expected, there are some cultural (as well as social and individual) differences in the practice of diagnosing ADHD, which presumably are reflected in differing estimates of prevalence. There are however

several countries such as Canada, Puerto Rico, The Netherlands, Germany, Japan, India, and China that have estimated prevalence rates of ADHD based on childhood samples that are relatively similar to the prevalence rate of approximately 3% to 5% in the United States (APA, 1994; Barkley, 1998b). A study of New Zealand children found a similar prevalence rate of 2.8% to 4.8% (Fergusson, Horwood, & Lynskey, 1993a). The estimated prevalence rate for children with only attentional problems, and not poor impulse control or high activity levels, is about 1% (Szatmari, Offord, & Boyle, 1989; Taylor, Sandberg, Thorley, & Giles, 1991).

Psychopharmacotherapy

The beginnings of psychopharmacology for children diagnosed with ADHD can be traced back at least 50 years. The late 1930s and early 1940s marked the beginning of medication therapy (Bradley, 1937; Bradley & Bowen, 1940), with reports on the efficacy of amphetamines in reducing disruptive behaviour and improving the academic performance of children hospitalised with behavioural problems. Later studies confirmed a positive drug response in more than half the samples of children hospitalised with “hyperactivity” (Laufer, Denhoff, & Solomons, 1957). As “minimal brain damage” was regarded as an indication for pharmacotherapy, it eventuated that many children with high activity levels or learning problems were so treated, particularly with stimulant medication (Werry, 1978). Consequently, by the 1970s stimulant medication had become a common treatment for ADHD.

Mechanism of action. Psychostimulant medications are so named because of their ability to increase arousal or alertness of central nervous system function. Studies of cerebral blood flow have shown that activity in the area of striatum, and

connections between orbital-frontal and limbic regions are enhanced during stimulant medication therapy (Lou, Henriksen, & Bruhn, 1984; Lou, Henriksen, Bruhn, Borner, & Nielsen, 1989). The actual site of action of stimulants within the central nervous system remains speculative (Barkley, Guevremont, Anastopoulos, DuPaul, & Shelton, 1993). Because of the structural similarity of psychostimulant medications to certain brain neurotransmitters, they are considered sympathomimetic compounds.

The three most commonly employed central nervous system stimulants are methylphenidate hydrochloride (Ritalin), dextroamphetamine (Dexedrine), and magnesium pemoline (Cylert). Methylphenidate increases dopamine release, blocks presynaptic uptake, inhibits monoamine oxidase activity, and has direct postsynaptic agonist activity. It is rapidly absorbed and peak behavioural effects occur within 1 to 3 hours and are dissipated within 3.5 to 5 hours after oral ingestion. It has a plasma half-life of between 2 to 6 hours and is entirely metabolised within 12 to 24 hours. The behavioural effects of the stimulants correlate with the period of maximum drug absorption (Dulcan, 1990) rather than with plasma levels (Patrick, Mueller, Gualtieri, & Breese, 1987). Current data suggest that there is high interindividual variation in dose requirement and it is suggested that doses need to be titrated on an individual basis to obtain maximum clinical utility (Rapport et al., 1987). Stimulants elicit a more variable response in young children with an increased potential for side effects and associated consideration for a lower dose (Botteron & Geller, 1993).

Prevalence of stimulant medication use. Until recently there has been a steady increase in the use of stimulant therapy for children's behaviour problems. Current estimates of the prevalence rate of stimulant medications for children and adolescents in the United States range from around 1% to 1.5% (Barkley, 1995),

varying with geographical location, information sources, and methodological differences. A cross-sectional survey of paediatricians indicated that the most common medication (97.6%) was methylphenidate (Kwasman, Tinsley, & Lepper, 1995). Safer, Zito, and Fine (1996) reported a 2.5-fold increase in the prevalence of methylphenidate from 1990 to 1995. By the middle of 1995, the prevalence was 2.8%, approximately equivalent to 1.5 million children aged 5 to 18 years.

Recent reviews of prescriptions of stimulants for New Zealand children indicate an increasing prevalence of this type of intervention (Matheson, 1996). Figures supplied by Pharmac (electronic mail, September 17, 1998) indicate that the estimated number of individuals who took stimulant medication for the year ended 31 December 1993 was 604, with 566 taking methylphenidate and 38 taking dextroamphetamine. For the year ended 31 December 1997, the total figure had risen to 8,601, with 8,312 taking methylphenidate and 288 taking dextroamphetamine. The figures for the Midland region (the region in which this research was conducted) for comparable periods were 59 (53, 6) and 767 (739, 28). The total costs for the two medications were \$140,760 at the end of 1993 compared to \$1,584, 221 at the end of 1997. No other data, such as age or dose levels, are available. Extrapolation from these figures indicates that approximately 1 in 1,000 people are taking either methylphenidate or dextroamphetamine.

In general, the use of stimulant medications has increased because of the reported efficacy of such medications (see Greenhill, 1998, for review; Wilens & Biederman, 1992), demonstrated safety in terms of relatively mild side effects, few atypical responses (DuPaul & Barkley, 1990), and because medical physicians are typically the first professionals to be consulted (Copeland, Wolraich, Lindgren, Milich,

& Woolson, 1987). Approximately 80% to 90% of children with presenting problems of high activity levels and difficulty sustaining attention are treated by paediatricians with stimulant medication at some point (Bosco & Robin, 1980; Pelham & Murphy, 1986). Parent and teacher ratings of the effectiveness of medication therapy for ADHD typically are quite favourable, probably because drug effects and the evaluation process are relatively quick and treatment requires minimum effort on the part of parents and teachers (Johnston & Fine, 1993; Liu, Robin, Brenner, & Eastman, 1991).

Methodological considerations for psychopharmacotherapy. Sprague and Werry (1971) are widely credited with establishing higher standards of research through their review of drug research up to 1971. They recommended that six criteria should be met for any drug study to be scientifically valid including: (a) random assignment of participants to different interventions, (b) appropriate inferential statistical analysis, (c) standardised evaluations of intervention effects, (d) inclusion of placebo condition, (e) double-blind evaluations, and (f) standardised doses within participants. Aman and Singh (1980) also recommended that participants be free of other “miscellaneous” pharmacological treatments that could interact with and/or confound the treatment under study. Sprague (cited in Sprague & Baxley, 1978) suggested that alternative intervention strategies, such as behaviour modification, be compared with the drug treatment under investigation to enable comparison of the relative efficacy of treatments.

Singh and Aman (1990) highlighted a number of ecological variables that they recommend be included in psychopharmacological research, including social validation, social comparison, and subjective evaluation. They also identified several ecobehavioural factors relevant to pharmacotherapy (i.e., coexisting problems or

disorders, behavioural interdependencies, reciprocal interaction, behavioural toxicity, drug-induced state dependency and stimulus control, concurrent treatments, situational specificity, nature of the environment, quality of care, and caregiver perceptions). Few studies, however, follow all these recommendations and the result is that findings often have limited generality and may appear to be in conflict with one another.

Pharmacological Interventions

Numerous treatment outcome studies have reported unequivocal improvements in the behavioural, academic and social functioning of school-age children (aged > 6 years) with ADHD through the use of stimulant medications (Barkley, 1990). Swanson et al. (1993) provided an extensive review of the effects of stimulant medication on children with ADHD. They found that stimulant medication generally produces immediate and dramatic positive changes in parent and teacher perceptions and improvements in performance on tests requiring concentration and attention in the majority of cases. They also found that placebo and expectancy effects, as well as direct pharmacological effects, contribute to the perceived positive effects. Swanson et al. (1993) concluded that short-term positive change cannot be predicted by previous physiological or psychological profiles, and that documented effects of stimulant medication on long-term adjustment (e.g., academic achievement or prosocial behaviour) are negligible.

Stimulant medication treatment has been associated with temporary management of diagnostic problems and temporary improvement of associated features, e.g., increased compliance and effort, decreased physical and verbal hostility, improved social interactions, increased amount and accuracy of work (Abikoff &

Gittelman, 1984; Barkley, 1988; Swanson et al., 1993; Whalen et al., 1989). However, the primary effect seems to be on attention span and impulsivity, although broadly defined (see Barkley, 1976 for review; Barkley, DuPaul, & Costello, 1993), and it is likely that reported improvements in cognitive functioning are due to decreased off-task behaviour and increased sustained attention (Sood, Wood, Ellis, Burns, & Singh, 1993). A good response to stimulants has been shown to be predicted by variables such as highly restless behaviour, severity of inattention, poor motor co-ordination, younger age, absence of coexisting psychiatric or emotional disorders, high IQ, and positive mother-child interaction (Aman & Turbott, 1991; Buitelaar, Van der Gaag, Swaab-Barnveld, & Kuiper, 1995; Taylor, 1986; Taylor et al., 1991; Voelker, Lachar, & Gdowski, 1983). For methylphenidate specifically, other factors such as oppositional defiant or conduct disorder have been shown not to affect the outcomes (Barkley, McMurray, Edelbrock, & Robbins, 1989; Pliska, 1989).

Other reviews, however, are less favourable and have found little evidence to support the view that stimulant medication treatment yields better academic outcomes, more positive relationships, or less antisocial behaviour than other treatments (e.g., Gadow, 1985; Jacobvitz, Sroufe, Stewart, & Leffert, 1990). A complicating factor is that response to methylphenidate is partly a function of dose (Rappport et al., 1987), and is dependent on the setting (e.g., home, laboratory, school), the informant (e.g., parent, teacher), the type of task presented to the child and type of behavioural measurements. Sprague and Sleator (1977) evaluated the effects of placebo and two doses of methylphenidate (0.3mg/kg and 1.0mg/kg) and found optimal cognitive performance occurred with the lower dose while improvement in ability to stay on task occurred at the higher dose. Cunningham, Siegel, and Offord (1985) compared the

effects of methylphenidate (placebo, 0.15mg/kg, and 0.5mg/kg) and peer interactions during free play and in a simulated school setting, between boys diagnosed with and without ADHD. They found that, in the 4- to 6-year-old age group, motor activity reduced at the higher dose while percentage of time on-task improved at the lower dose. In general, it has been shown that high activity levels, disruptive social behaviour and other cognitive and performance variables show a linear or systematic curvilinear dose-response curve (Barkley, DuPaul, & McMurray, 1991; Tannock, Schachar, Carr, & Logan, 1989).

Only a few studies have examined outcomes for stimulant medication treatment with young children (aged < 6 years). While stimulant medication can reduce oppositional and aggressive behaviour, increase on-task behaviour, improve mother-child interactions and compliance to parental commands, and improve attention and quality of play in young children with ADHD (Alessandri, 1992; Alessandri & Schramm, 1991; Barkley, 1988, Cohen, Sullivan, Minde, Kovak, & Helwig, 1981, Conners, 1975; Schleifer et al., 1975), there are nevertheless equivocal findings as detailed below. This is no doubt partly due to clinical issues and methodological differences, such as differences in diagnostic methods and absence of baseline or placebo conditions that make it difficult to determine whether or not there are overall patterns of treatment effectiveness. Most of the observations have been conducted in unnatural settings, without siblings or other family members. Studies also tended to use small samples consisting mostly of boys and their mothers. While many of the earlier studies employed best practices of the day, the differences in diagnostic criteria and clinical practice make it difficult to compare them with more recent studies.

Conners (1975) compared the effects of methylphenidate with the effects of a placebo condition in young children (59 children, aged < 6 years). Significant drug effects were not demonstrated on most measures, however there was some indication based on physician and parental report of increased attention and decreased activity level for children taking the active medication. The measures used in this study generally were inappropriate for the young sample and more than half of the children refused to co-operate on a number of tasks that they reportedly found difficult and tedious. There were many deviations from the standard protocol because of difficulty testing this age group, and it was suggested that the results were more variable and unpredictable than with older children given similar treatment. Schleifer et al. (1975) found that although children (mean age = 5.6 years) were rated as less “hyperactive” and “impulsive” while they were on active medication (mean dose = 5mg), their performance on psychological tests and observational measures did not show significant changes. They concluded that methylphenidate was less efficacious for young children than for school-aged children. Significant improvements occurred as much as a function of time as of drug treatment. This may have been due to confounds such as high quality nursery care for the children, weekly group meetings with other mothers and interviews with a psychiatrist. Schleifer et al. (1975) also suggested that mothers might have perceived their children to be less overactive and less aggressive just because they tended to have high expectations that the drug would help their child.

Barkley (1988) examined the effects of methylphenidate on interactions between mothers and their children (age range = 2.6 to 4.9 years). Few effects were found during free play at either dose (0.15mg/kg or 0.5mg/kg) except for a decrease in

the mothers' use of commands while children were taking the lower dose. Children on the higher dose had decreased off task and non-compliant behaviour and significantly increased rates of compliance as well as better sustained compliance with maternal commands. Although the overall group response to medication was positive, over a third of the sample did not remain on medication after the drug trial, as few if any effects were deemed beneficial to the child. Other research also suggests that methylphenidate increases the compliance of young "hyperactive" boys to their mothers' commands while decreasing their off-task and negative behaviour. Mothers decreased their commands and disapproval and increased their responsiveness and positive attention to the boys (Barkley & Cunningham, 1980; Humphries, Kinsbourne, & Swanson, 1978).

Barkley, Karlsson, Strzelecki, and Murphy (1984) examined the effects of age and dose of methylphenidate (placebo, 0.15mg/kg, 0.5mg/kg) on the mother-child interactions of children diagnosed as "hyperactive" during free play and structured tasks. They found a corresponding decrease in the mothers' instructions and an increase in child compliance and duration of compliance as a function of the child's age, the youngest age group (4 years to 5 years 11 months) showing the most improvement. Children in both the young and middle (6 years to 7 years 11 months) groups initiated interactions with mothers more often than the group with older children (8 years to 9 years 11 months). Only 1 of the 15 measures in free play (i.e., mothers' negative behaviour) showed improvement with both drug doses. In the structured task period, both doses led to improved compliance and on-task behaviour and the higher dose led to a decline in mothers' direction and negative behaviour. The higher dose produced significantly more side effects. Barkley et al. (1984) suggested

that while positive effects may be seen in free play situations, they are more obvious in task situations that tax the child's attention span and self control problems to a greater extent. These situations also are more structured and have greater task demands for the parent. Barkley et al. (1984) suggested that the higher dose of methylphenidate was needed to change parental reactions to the children, which presumably came about because the child's behaviour had changed at that dose. Sprague and Sleator (1976) also found that larger doses of methylphenidate were required to change teacher ratings than were required to improve attention span as measured by performance on laboratory tasks. It is likely that expectations about, or ratings of, a child's behaviour are difficult to change unless the behaviour changes to a clinically significant level.

In a recent study by Musten, Firestone, Pisterman, Bennett, and Mercer (1997) 31 children with ADHD, aged 4 to 6 years, participated in a double-blind, placebo-controlled study using twice-daily doses of placebo, 0.3mg/kg or 0.5mg/kg methylphenidate. Post-treatment assessment involved completion of rating scales (Conners' Parent Rating Scale, Side Effects Rating Scale), cognitive measures (Gordon Diagnostic System Delay and Vigilance Tasks) and parent-child interactive tasks. Methylphenidate at both doses resulted in increased ability to sustain attention during the cognitive task, as measured by the number of correct responses on a vigilance task. Parental ratings of the intensity of their child's negative behaviours, inattention and impulsivity decreased with medication, but dose related effects were variable. Musten et al. (1997) found that, in contrast to the previously mentioned research, child compliance to parents' requests did not improve with methylphenidate, however, the children stayed on task more after treatment with the higher dose. Although parents reported noticing positive changes in their children at home, similar

findings were not evident in the laboratory. It was suggested that the potentially beneficial effects of the medication might not have occurred because the doses were too low or because medication alone was not sufficient to affect the parent and/or child attributes that contribute to compliance. They did not suggest, however, that medication was not an appropriate intervention for these problems.

While it has been suggested that about 75% of all children treated with stimulant medication improve to some extent on various behaviour measures (Barkley et al., 1993; Greenhill, 1998), many also recognise that stimulant medication is no panacea for treating behaviour problems nor should it be the sole form of therapy. There are a significant number of individuals whose problems do not improve or are exacerbated by the use of stimulant medication. As Werry (1978) noted, stimulants allow children to show what they know but they are unlikely to alter the child's knowledge of what needs to be done. "Medication does not teach any new skills; it merely acts as a setting event for the occurrence of appropriate behaviour when maladaptive behaviours are reduced" (Ellis, Singh, & Singh, 1997, p.152). In a medical paradigm, medication is designed to alleviate symptoms and consequently alters behaviour and sets off a different chain of responses and interactions. Obviously a child with ADHD cannot learn mathematical operations, for example, merely by taking a pill, but the effects of medication may make it possible for that child to sit long enough to learn maths skills, or to stop and think about the consequences of their behaviour. The child needs to be taught skills (e.g., academic, social) whether or not he or she takes medication. The child also needs opportunities for learning skills and perhaps medication allows for that opportunity by predisposing the learner to be more responsive, less distracted or less active.

It is generally recommended for young children that other treatments should be tried before stimulant medication, given the limited probability of a positive response (<65% for this age group) and the higher incidence of side effects (Barkley et al., 1993). Dulcan (1990) suggested that a more elaborate multimodal plan be applied to young children, including parent programmes, training in behavioural modification strategies, and placement in a structured, well-staffed nursery programme. Young children may not be optimal candidates for methylphenidate because of the medication's short half-life, and the child's higher rate of metabolism may exacerbate the "rebound" withdrawal effects and other adverse treatment effects (Greenhill, 1991).

Behavioural Interventions

One major behavioural intervention used for children with ADHD and their families is parent training. The effectiveness of behavioural parent training on the behaviour of young children has been well supported (see Graziano & Diament, 1992, for review) and incorporated into some programmes for children with ADHD. Unfortunately, many of the studies focus on non-compliance as the main target of treatment. Conclusions about parent training also are often complicated because some children concurrently receive medication.

Pisterman, McGrath, Firestone, and Goodman (1989) used a programme adapted from Forehand and McMahon (1981) and Barkley (1981) for young children with ADHD. On each measure of compliance, the treatment group showed significant gains at follow up, but there was no evidence of generalisation of treatment effects to behaviour that was not targeted in the treatment. Pisterman et al. (1992) also used a parent-training programme based on the compliance model to increase on-task

behaviour of young children (aged from 3 to 6 years) with ADHD. Outcome measures were: (a) child compliance, i.e., child compliance relative to the total number of parental commands, (b) child attention skills, i.e., sustained attention to task (mean time spent on a 10-minute parent supervised attention task, mean time spent on an unsupervised attention task, mean time spent in free play), (c) parent skill variables, and (d) parental style of interaction. They found a significant increase in percentage of compliance and a significant decrease in time taken to complete a compliance task command list. Parents issued more appropriate commands and consistently reinforced compliance; they gave fewer directive statements and increased positive feedback to children. There was however no evidence of treatment effects on any of the attention measures. They suggested that pharmacotherapy was the preferred intervention for attentional problems. They concluded that behavioural parent training may be a powerful intervention for young children's misbehaviour and non-compliance but may be much less effective with types of behaviour that are more "biologically" based. This implies that parent training is helpful for the behaviour typically exhibited by young children, which many people would call "naughty", but less so for behaviour that is thought to have strong organic or genetic origins, such as ADHD. This is a problematic conclusion in the sense that it seems to classify different behaviours as more or less amenable to behavioural intervention according to whether there are major organic influences. It still remains that problem behaviour needs to be ameliorated no matter where it originates and regardless of the controlling variables.

Anastopoulos, Shelton, DuPaul, and Guevremont (1993) extended the study by Pisterman et al. (1992) to examine change in parent functioning and child variables resulting from parental participation in a behavioural parent-training programme

specifically designed for school-aged children with ADHD. Relative to wait-list controls, participants who received training showed significant post-treatment gains in both child and parent functioning and these improvements were maintained 2 months after treatment. There were reductions in parent stress and increases in measures of parenting self-esteem with overall improvements in the severity of ADHD problems.

Strayhorn and Weidman (1989) encouraged parents to use story reading, dramatic play, and conversation with their children in addition to more traditional behavioural parent training programmes. There was emphasis on teaching parents to have fun with and instruct their children, as contrasted with the more typical emphasis on child compliance. They recruited children (mean age = 3.9 years) at risk for behavioural problems; over half of the children were rated by their pre-school teachers as restless, squirmy, inattentive, and having poor concentration. Children who had high pre-test levels of attentional problems exhibited the biggest improvements. A follow up one year later found no difference between the two groups on parent ratings and child achievement test scores, but teachers rated children in the treatment group as improved with regard to attentional and activity problems (Strayhorn & Weidman, 1991).

Danforth (1998) used a multiple baseline across participants design to study the effects of parent training with eight mothers and their children who were diagnosed with ADHD and Oppositional Defiant Disorder. The children were aged from 4 years to 7 years 4 months (mean age = 5.7). Measures were direct observation of mother-child interactions, parental daily report, standardised rating scales and self-reported parenting behaviour and stress. The programme was accompanied by a reduction in children's oppositional behaviour, improved parenting behaviour and

reduced maternal stress. These changes were relatively stable at the 6-month follow up. All children in this study reached a criterion for clinical improvement in compliance established by Pisterman et al. (1989).

Erhardt and Baker (1990) examined a time-limited family-based behavioural intervention for two young children with ADHD. Families completed a 10-week child management training programme and attended a number of follow-up sessions. Improvements were found in the mothers' confidence in their child management ability and knowledge of behaviour modification principles and techniques. While Erhardt and Baker (1990) suggested that their parent-training programme was insufficient to normalise the behaviour of children with ADHD, there nevertheless were improvements in parental ratings of activity levels and in the parent-child relationship. One parent, who prior to the programme had viewed her son as a "little pest who was constantly frustrating me and ruining my life", had come to enjoy spending time with him and to feel proud of him. The home environment was reported to be considerably more pleasant because both parents liberally praised their son's desirable behaviour. The researchers noted that in contrast to improvements seen in more specific behaviour problems targeted by parents, chronic and pervasive problems, such as non-compliance, appear less likely to be ameliorated by the type of brief training programme used in their study. This conclusion however was based on the results from only two children and their families.

Long-term follow-up studies of parent training programmes suggest that 30% to 40% of parents involved in the programmes and 25% of teachers report children to have behaviour problems that are still in the clinical range. Parent and family characteristics such as marital distress, spouse abuse, lack of a supportive partner,

maternal depression, poor problem solving skills and high life stress are associated with fewer gains. Families with socio-economic disadvantages and a lack of social support for the mother outside the home are less likely to maintain treatment effects (see Webster-Stratton, 1991 for review). Dumas and Wahler (1985) found socio-economic disadvantage and insularity to be the most significant predictors of parent training outcomes. Elder, Eccles Ardel, and Lord (1995) found that parental sense of efficacy was directly related to socio-economic status so that low status was related to low efficacy.

Based on the outcomes of the studies mentioned above, parent training appears to be a useful short-term intervention for young children with ADHD and their parents. The studies showed a decrease in parenting stress and improvements in parenting style, skills and confidence. While most studies found improvements in child compliance, the most common target for change, there was little evidence of positive changes in attentional problems or generalisation to non-targeted behaviours. Given that the studies reviewed above involved children with ADHD, it is surprising and somewhat disconcerting to find that attention, activity levels or impulsivity generally were not intervention targets. A major limitation of the studies is that most compared only two conditions, i.e., behavioural treatment versus no treatment (wait-list controls), and, apart from the study by Strayhorn and Weidman (1989), did not compare parent training with other types of treatment, such as pharmacotherapy or variations of parent training.

Combined Interventions

Swanson et al. (1993) stated that one of the most important issues to be addressed is the effect of combined psychosocial and pharmacological interventions;

while many studies end with a recommendation that stimulants should always be used in combination with educational and behavioural interventions, they found very few references to support this recommendation. Even the manufacturer's instructions for using methylphenidate recommend combined or multimodal treatment (Physicians Desk Reference, 1994). No doubt the limited data on combined treatments are partly because of the expense, duration, and complexity of such studies, difficulty in sustaining child and family participation in multiple interventions over time, and the need for large samples to address all of the questions posed (Hechtman, 1993; Richters et al., 1995). Yet many researchers agree that the combination of treatments is superior to treatment in isolation (Kolko, Bukstein, & Barron, 1999; McBurnett, Lahey, & Pfiffner, 1993; Pelham & Hinshaw, 1992; Pelham & Murphy, 1986).

Given that both pharmacotherapy and behavioural interventions lead to improvements in performance or behaviour as assessed on various measures, it makes some sense that a therapeutic programme consisting of a combination of both treatment modalities would be superior to either used alone. This is however only one of several possible outcomes of a treatment interaction. Combined interventions could produce a therapeutic response on a single measure that is greater than (potentiation), equal to (addition) or less than (inhibition) the effect of the component treatments, or an effect equivalent to either alone (reciprocation) (Hollon & Beck, 1978). Two treatments could also complement one another by addressing different sets of problems (Pelham & Murphy, 1986).

A number of studies have evaluated the effects of behaviour therapy, either alone or in combination, with stimulants in children with ADHD (for reviews see Hinshaw & Erhardt, 1993; Klein & Abikoff, 1997; Hinshaw, Klein, & Abikoff, 1998),

however there are relatively few studies with young children. An early study comparing parent training, stimulant medication and their combination provided no evidence for the superiority of combined treatment (Firestone, Kelly, Goodman, & Davey, 1981). While most studies evaluating combined treatments, including the present study, involve medication for the child and some sort of behavioural intervention with the parent, Cohen et al. (1981) evaluated the relative effectiveness of methylphenidate and cognitive-behaviour modification in a sample of kindergarten-aged children. Cognitive-behaviour modification consisted of 20 1-hour individual treatment sessions for each child. Children were randomly assigned to one of four groups: (a) six children received cognitive-behaviour modification, (b) eight children received medication, (c) six children received cognitive-behaviour modification plus active medication, and (d) four children received no treatment for the four month study period. Following treatment, parents rated their children's problems as mild (12.5%) or moderate (71%) and most rated them to be improved (75%), irrespective of the type of treatment (or no treatment) that the child received. More parents of children receiving methylphenidate were satisfied with treatment (78%) compared to those receiving only the behavioural treatment (50%). Follow up one year later indicated that all but one child continued to have some behavioural or academic problems.

Pollard, Ward, and Barkley (1983) compared behavioural parent training with methylphenidate for three boys with a diagnosis of hyperactivity. Both treatments decreased the number of commands given by the mothers, whereas only the parent training significantly increased the amount of positive attention given to the children. They concluded however that there would be no significant advantage in combining

the treatments. It has been suggested that the short-term efficacy of methylphenidate in terms of enhancing mother-child interactions may increase the probability that parents will be successful in the use of behavioural techniques and this success might therefore minimise parent discouragement and subsequent failure to continue with behavioural interventions (Ialongo et al., 1993).

Two further studies with school-age children found that combined treatments were more effective than behaviour therapy interventions, but did not yield significant improvements beyond those found with methylphenidate treatment alone (Horn et al., 1991; Pelham, Carlson, Sams, Dixon, & Hoza, 1993). For example, Pelham et al. (1993) showed that there was little incremental benefit to their behaviour modification intervention or to a higher dose (0.6mg/kg) of methylphenidate beyond the effects of a lower dose (0.3mg/kg) of methylphenidate, however the effects of the behavioural intervention were improved with the addition of either dose of medication. Kolko et al. (1999) extended an evaluation of combined interventions by examining multiple domains of assessment (e.g., problem and positive behaviours) in different settings (e.g., classroom, enrichment activity). They found that the combination of methylphenidate and behaviour modification resulted in more positive effects, in terms both of number of behaviours and settings, than either treatment alone.

An early study by Gittelman et al. (1980), in which children were randomly assigned to methylphenidate-alone, behaviour therapy plus placebo or behaviour therapy plus methylphenidate, found that the combined intervention produced more overall favourable outcomes than the other interventions. Although parents' ratings indicated that all treatments were equally effective, teachers' ratings indicated that the combined intervention was more effective. Psychiatrist ratings indicated 100%

improvement in behaviour for children in the combined intervention group, whereas only 81% improved with medication alone and 58% with behaviour therapy plus placebo.

The equivocal results on outcomes of combined treatments must in part be due to ambiguous inclusion or diagnostic criteria, lack of known treatment integrity (especially with regard to behaviour therapy protocols) and the failure to incorporate multiple dependent measures (Rapport, 1987). Clearly there need to be more studies that address these particular problems, as well as some of the other methodological issues listed by Sprague and Werry (1971) and the ecobehavioural variables identified by Singh and Aman (1990).

Child, Parent and Family Characteristics

There is a range of psychosocial factors that might contribute to the variable outcomes of intervention. Behaviour does not exist in a vacuum and it is necessary to examine some of the factors associated with its development. Potential predictors of early emergence and persistence of ADHD in children include: (a) family history of ADHD, (b) maternal smoking and alcohol consumption, (c) poor maternal health during pregnancy, (d) single parenthood, (e) low academic attainment, (f) poor infant health, (g) developmental delays, (h) early emergence of high activity levels and demandingness in infancy, and (i) critical/directive maternal behaviour in early childhood (Barkley, 1990). These problems however also can lead to a multitude of other outcomes not necessarily associated with ADHD. Protective factors include higher maternal education, better infant health, higher cognitive ability and perhaps language skills and greater family stability (Campbell, 1987; Palfrey, Levine, Walker, & Sullivan, 1985).

Coexisting child behaviour problems. Hinshaw et al. (1998) stated that it is essential that treatment studies document coexisting behaviour problems in children, such as defiance and aggressiveness, because of their effect on the persistence and exacerbation of ADHD. Precise estimates of the overlap between antisocial behaviours and ADHD are difficult to make because of differences in diagnostic criteria and differences in sample characteristics across studies, although it is generally higher in clinical samples than in normative samples. Stewart, DeBlos, and Cummings (1979) found that about 60% of children with conduct problems seen in a clinic setting also had a diagnosis of hyperactivity. In New Zealand, Anderson, Williams, McGee, and Silva (1987) showed that 35% of those who had a diagnosis of Conduct Disorder or Oppositional Defiant Disorder also had a diagnosis of ADHD. Barkley (1990) indicated that up to 65% of children with ADHD also meet diagnostic criteria for Oppositional Defiant Disorder and that 20% to 30% of these children are likely to develop significant conduct problems and antisocial behaviours. It is possible that having one set of problems predisposes an individual to having another set of problems or a greater number of problems because of some organic bias. On the other hand, a chain of environmental events might occur that exacerbates certain behaviours. For example, impulsive behaviour, such as evidenced by a child rushing across the road because he or she had seen something of great interest, might be viewed as being non-compliant because he or she seemed to not pay attention to the parent's request to stay close. Children who are impulsive, who act before thinking about consequences, are more likely to engage in behaviour that provokes negative reactions from others which in turn might lead to an escalation of those behaviours or occurrence of related behaviours, such as defiance.

Fergusson, Horwood, and Lynskey (1993b) found that Conduct Disorder and ADHD behaviours can be distinguished on the basis of factor analytic study and that they have different long term outcomes, with Conduct Disorder being a precursor of later offending and ADHD being a precursor of later academic difficulties. While ADHD and Conduct Disorder may be distinct dimensions of child behaviour, certainly based on diagnostic criteria, they are also highly related (Fergusson, Horwood, & Lloyd, 1991). There are some indications that children with combined ADHD and conduct disorder problems exhibit the most problematic features of each “disorder” and appear to be at greater risk for concurrent and later disorders than individuals without this combination (Barkley, Fischer, Edelbrock, & Smallish, 1990; Farrington, Loeber, & van Kammen, 1990; Lynam, 1996; Schachar, Rutter, & Smith, 1981; Werry, Reeves, & Elkind, 1987). In addition, children with combined high activity levels and aggressive behaviours tend to have more adverse family environments (McGee, Williams, & Silva, 1984; Moffitt, 1990). A major follow up study of more than 900 Swedish youths indicated that high activity levels and aggressive behaviour in childhood was associated with adult psychopathy (Magnusson, 1988). Clearly, the stability of, and outcomes associated with, these problems highlight the need to intervene early and change the developmental trajectories of these children. It also is important to measure coexisting problems, such as oppositional defiant behaviour, as well as aspects of cognitive ability in intervention studies involving children with ADHD.

Child cognitive ability. It has been shown that there is a relationship between ADHD and lowered IQ, particularly verbal IQ (e.g., Halperin & Gittelman, 1982; Hinshaw, 1992; Mariani & Barkley, 1997; Werry, Elkind, & Reeves, 1987). Werry,

Elkind, and Reeves (1987) cautioned that, in research, group differences in verbal IQ should not be viewed as an artefact of group selection or as a source of error to be statistically removed. Barkley (1995) concluded that ADHD is associated with a small but significantly adverse effect in the development of intelligence, perhaps accounting for 6% to 10% of the variance in verbal IQ, however he suggested that it has an even larger negative impact on effective adaptive functioning, self-regulation, goal-directed and future-oriented behaviour. This could be accounted for within a behavioural framework such as Staats' (1996) "psychological behaviorism", which was derived from studying basic behavioural repertoires, such as language and emotion, and considers what they are, how they are learned and how they function in affecting the individual's experience, learning and behaviour. As suggested by Evans (in press), the interactionism that is central to "psychological behaviorism" theory provides a strong bridge between behavioural and ecological models of childhood needs. Using an example from Staats (1996), an intelligent child is one who has learned rich language repertoires. This child, in comparison to one who is not so intelligent, can follow directions better, or better guide his or her own behaviour by self-speech. One could predict that such a child would be less likely to engage in behaviours typically associated with ADHD.

McGee, Partridge, Williams, and Silva (1991) found that children identified as "pervasively hyperactive" at 3 years showed poor language skills on measures of vocabulary and verbal comprehension and expression. Love and Thompson (1988) also reported a significant relationship between language problems and hyperactivity in clinic-referred young children. These findings are suggestive of a link between brain

development in areas associated with language and motor activity or attentional processes.

It has been shown that children with ADHD and other children perform differently on the Continuous Performance Test (Corkum & Seigel, 1993; Gordon, 1983; Grodzinsky & Diamond, 1992; Losier, McGrath, & Klein, 1996). This test is the most frequently used test of cognitive function in paediatric psychopharmacology, especially in research on ADHD (Aman, 1993). Performance on this test has been found to be sensitive to moderate and high doses of stimulant medication (Barkley, Fischer, Newby & Breen, 1988; Barkley et al., 1991; Byrne, Bawden, DeWolfe, & Beattie, 1998; Rapport, DuPaul, Stoner, & Jones, 1986; Losier et al., 1996; O'Toole, Abramowitz, Morris, & Dulcan, 1997). Children with ADHD have been found to have generally slower reaction times than control children (Rapoport, 1983) and stimulant medication has been shown to normalise reaction times in children with ADHD, speeding up response times and improving accuracy (Coons, Klorman, & Borgstedt, 1987).

Numbers or letters are most commonly used in Continuous Performance Tests and therefore tend to be inappropriate for young children with limited knowledge or experience of such stimuli. The rapid rate of stimulus presentation and the long duration of the tasks also contribute to their inappropriateness for young children (Conners, 1975; Corkum, Byrne, Ellsworth, & Hospital, 1995). Harper and Ottinger (1992) found that the use of familiar pictures (e.g., bird on a tree branch) was more interesting for young children. They found that young children with hyperactivity performed poorly on both a standard version of the Continuous Performance Test and a pre-school vigilance task; on both tasks they made more errors of omission and

spent more time off-task than expected of typical children. They also made more errors of commission on the Continuous Performance Test. Mariani and Barkley (1997) however found individual measures of impulsiveness and commission errors did not significantly distinguish between young children with or without ADHD. They suggested that the pre-school version of the Continuous Performance Test that they used (Gordon, 1983) might have been too easy for the children to perform to be of much value in differentiating between these children.

Kerns and Rondeau (1998) investigated the performance of young children (187 control, 18 clinical sample) on three versions of a Continuous Performance Test (correctly paired pictures plus audio, audio only and incorrectly paired pictures and audio). They found significant age effects for the number of correct hits on all three tasks and for the number of commission errors on the first task, with improved performance as age increased. In spite of a strong age effect, there were a low number of hits anyway, especially in the performance of younger children. They found a significant difference between the percentage of hits compared with the percentage of commission errors indicating that children were trying to perform each of the tasks correctly and not simply responding at random. They found significant differences between clinical and control samples on commission errors, but no differences on correct hits or reaction time to hits or commissions, indicating (to them) problems with impulsive responding. This conclusion is consistent with other work by Byrne, DeWolfe, and Bawden (1998) who found that young children with ADHD made significantly more commission errors on a pre-school cancellation task than did matched controls, but did not exhibit more omission errors or differ in motor speed. They suggested that in earlier years children with ADHD might primarily have

difficulty inhibiting behaviour and therefore respond “impulsively”. Kerns and Rondeau (1998) reported that this also was consistent with observed behaviour where the clinically referred participants would tell the examiner that they were only supposed to “click for the sheep” (the target), while “clicking” to a non-target; it was as if the children “knew” what they were supposed to do but were unable to inhibit their inappropriate responding.

Influences on parenting. Parental antisocial behaviour and paternal substance abuse have been shown in some studies to be associated with conduct disorder but not hyperactivity (Lahey, Russo, Walker, & Piacentini, 1989; Stewart et al., 1979). Nigg and Hinshaw (1998) found that regardless of coexisting problems (e.g., Oppositional Defiant Disorder), boys with ADHD more often than comparison boys had mothers who had a major depressive episode and/or marked anxiety problems in the past year and more often had fathers with a childhood history of ADHD. Whereas low socio-economic status exacerbated the display of antisocial behaviour, especially among boys with ADHD, parent traits and child behavioural problems were observed over and above the effects of socio-economic status. Stormont-Spurgin and Zentall (1995) found that compared to young children diagnosed with hyperactivity, young children with hyperactivity plus aggression had families with more restrictive fathers, siblings who retaliated aggressively, and mothers who reported more physical aggression directed to their partners and more verbal aggression received. The children with both hyperactivity and aggression had mothers who reported being more restrictive and controlling than mothers of young children with only aggression and somewhat more restrictive than mothers of children with hyperactivity alone. But as they suggested,

restriction and control may be parental reactions to a challenging young child rather than the cause of the problem.

Woodward, Taylor, and Downey (1998) found that parents of children aged between 7 and 10 years with “pervasive hyperactivity” were more clinically disturbed and reported receiving less practical support from family and friends than did parents of control children. After adjusting for the presence of child conduct problems, they found that parental coping, disciplinary aggression, negative affect and authoritative parenting style were significantly associated with hyperactivity (i.e., ADHD predominantly hyperactive-impulsive type). After adjusting for the effect of parent mental health, they found that parental coping, disciplinary aggression, authoritative parenting, and sensitivity were significantly associated with hyperactivity. Woodward et al. (1998) suggested that parenting is influential for hyperactivity in that children are exposed to parenting behaviours that are aggressive and less proactive.

Parental rejection and/or lack of involvement have been linked consistently to the development of child behaviour problems in general (Miller, 1995; Shaw & Vondra, 1995). Uninvolved parents do not contingently reinforce their child’s behaviours and this unresponsiveness creates an environment in which disruptive child behaviour is likely to develop. “Acting out” becomes a means through which the child has some control over the environment because the behaviour generates consistent, if aversive, parental response. Some children learn to generate synchrony through co-operative transactions and others do so in a coercive or disruptive manner (Wahler, 1994). Rothbaum and Weisz (1994) conducted a meta-analysis of 47 studies and found that parental control techniques were related significantly to externalised behaviour. Control techniques loaded on a broad acceptance-rejection factor rather

than an orthogonal permissive-restrictive factor and were part of a larger pattern of affectionate-responsive (or at the negative pole rejecting and coercive parenting).

In a 10-year follow up study, Hechtman (1981) compared families of children with “hyperactivity” with normal control families. Of several child-rearing practices assessed, a punitive-authoritative style tended to be more marked in families with children who had high activity levels (hyperactivity). Mothers of boys with these problems tended to be less responsive to positive or neutral child communications and to more frequently reprimand and punish their sons compared to mothers of control boys (Barkley, Fischer, Edelbrock, & Smallish, 1991).

Buss (1981) observed highly active young children with their parents during a laboratory teaching task. Parents of these children tended to intrude physically; he described these parents as engaging in power struggles and competition with their children. Mothers of more active children were less responsive to their needs and less clear in conveying their expectations about the task than mothers of comparison children. Impatience or hostility toward active children was noted in all child-parent pairings, except for father-son combinations. Campbell, Breaux, Ewing, Szumowski, and Pierce (1986) also found that mothers of “hard-to-manage” young children were more negative and controlling during unstructured mother-child play in the laboratory. Campbell, March, Pierce, Ewing, and Szumowski (1991) reported that boys identified as a problem by mothers and/or teachers at pre-school age came from families experiencing more stressful life events.

When families of children with ADHD display interaction difficulties the direction of effects is an open question, however it is likely that there is reciprocal determinism whereby both parent- and child-effects operate together with escalating

cycles of discordant interactions (Hinshaw, 1997). For example, when children are treated with stimulant medication, maternal negativity diminishes (Barkley & Cunningham, 1979, 1980). Conversely, poor parenting can foster “acting-out” behaviour. Schachar, Taylor, Wieselberg, Thorley, and Rutter (1987) found significant short-term improvements in levels of affective tone of parent-child relationship (older children) and expressed maternal warmth, and decreased levels of maternal criticism and negative encounters with siblings in children who responded positively to medication. It has been suggested that rather than negative parent-child interaction being caused by poor maternal management skills, mothers of children with ADHD appear to possess effective behavioural monitoring abilities but resort to more coercive, directive strategies when children are not medicated because a positive management style seems less successful (Cunningham & Barkley, 1978). It therefore seems important to include some measure of parenting style or efficacy in intervention studies for children with ADHD, especially if intervention directly involves input from parents.

According to a transactional model, changes in behaviour are the result of a series of interchanges between individuals within a shared system and following specifiable regulatory principles; there is an emphasis on multidirectionality of change while specifying regulatory sources that mediate change (Sameroff, 1995; Sameroff & Fiese, 1990). It may be that small changes in child behaviour (remediation) are all that are necessary to re-establish a well-regulated developmental system, or changes in the parents’ perceptions of the child (redefinition) may be the most strategic intervention or improvements in the parents’ ability to take care of the child (re-education).

Contribution of other family variables. Kazdin, Holland, and Crowley (1997) found that among families who begin treatment in mental health services 40% to 60% terminate prematurely. Socio-economic status disadvantage, minority group status, high levels of stress, family dysfunction and difficult living circumstances were among the salient features. Poverty, bad housing and low socio-economic status have been investigated several times as possible factors in ADHD but their role is still uncertain. In some surveys there has been no association at all (Campbell & Redfering, 1979; Goyette, Conners, & Ulrich, 1978; Szatmari et al., 1989; Taylor et al., 1991), however children with ADHD-type behaviours generally have been found to be more common in families characterised by marital discord, hostile parent-child relationships and discordant family life. These associations have emerged from studies in which the cases are determined on the basis of the child's behavioural problems and this allows for the possibility that changes or effects in family life are secondary to these problems. Family adversity and adverse peer relationships have been found to predict later outcomes independently of the extent to which they are initially associated with hyperactivity (Crouch, 1992). Taylor (1995) suggested that treatments might fail to be maximally effective if they are confined to interventions such as stimulant medication, where impact is on the behaviour of the child; however, as discussed earlier, there are positive reciprocal effects on maternal behaviour.

Biederman et al. (1995) found strong evidence for the importance of adversity factors on children's adaptive functioning and emotional health, but they also showed that this impact appears to be independent of ADHD. Children with ADHD and those without ADHD showed a similar positive association between the number of adversity factors and measures of psychopathology and impaired psychosocial functioning.

Further analyses showed that with each increase in the number of adversity factors intellectual ability decreased in children with ADHD but not in control children.

Children identified as showing problems when they are young come from families coping with more adverse circumstances that go beyond parenting and may contribute to less optimal patterns of mother-child interaction (e.g., McGee et al., 1991; Richman, Stevenson, & Graham, 1982). Earlier family adversity may not necessarily predict continuing problems, but problems are more likely to persist in the context of ongoing and concurrent family adversity (Campbell, 1995). Fergusson, Horwood, and Lynskey (1994) examined a small group of adolescents identified as displaying multiple problem behaviours during the course of their longitudinal study of a birth cohort of New Zealand children. Many of these children came from seriously disadvantaged, dysfunctional and disorganised home environments. Multiple problem home environments were characterised by a history of long-standing and often unremitting problems and difficulties including social disadvantage, parental criminality, substance abuse and other problems of adjustment, impaired parenting and lowered standards of child care, family instability, change and marital conflict. While the strength of this association was high, there also were effects of a generally advantaged home environment in protecting children from developing multiple problems.

Present Study

Even though there is extensive research in the area of ADHD, there are many gaps in our knowledge regarding interventions and the factors that influence their effectiveness. In particular, there is very little research involving young children or combined treatments. In addition, there has been a proliferation of treatment studies

in the United States and much of our clinical practice in New Zealand is based on this work. There may be sufficient cultural differences to warrant research in this area in New Zealand to explore the generality of overseas findings.

The present study was designed to compare the effectiveness of pharmacotherapy (methylphenidate) and behavioural intervention (parent training) both separately and in combination and was focussed primarily on the following questions for young children diagnosed with ADHD:

1. Is the combination of parent training and stimulant medication better than either treatment alone?
2. Is comprehensive behavioural intervention or pharmacotherapy more effective than the other?
3. To what extent is behaviour normalised by treatment?
4. What factors may influence the outcomes, e.g., coexisting problems, IQ, socio-economic status, parenting behaviour, family environment?

Rationale for design of study. The research design (see Method) was chosen for its appropriateness for casting light on the first three research questions while minimising possible threats to internal validity. It was especially designed to rule out ambiguity in the interpretation of treatment effects and therefore the ability to control for placebo effects was considered important. These considerations are based on the following recommendations. Hollon and Beck (1978) argued that designs that equate placebo plus psychotherapy with psychotherapy alone are often inappropriate. They stated that studies using a classic factorial design (four-cell design) can establish the presence of a pharmacologically mediated interaction but not the absence of a psychologically mediated one (p.471). The determination of the relative efficacy of

medication and behavioural intervention therefore requires a minimum of four groups, i.e., medication, pharmacological placebo, behavioural intervention and behavioural placebo. The inclusion of placebo conditions allows for determination of the efficacy of each treatment component (Hollon & Beck, 1978).

To be able to address the fourth question, it also was considered important to measure a range of factors given significance by previous research, bearing in mind that only large effects would be readily detectable given the limited number of children who could be included in the study.

Measures used in the study. The measures used in the present study were judged to have adequate reliability and validity. Some measures, such as the ADHD Rating Scale, are not standardised for young children but were used because of their applicability to the area of ADHD. Full details on reliability and validity are provided in Appendix H. It has been recommended that a wide range of dependent measures be included in studies involving combined treatments because of the possible discrepancy between treatment effects on different domains (e.g., Kendall & Lipman, 1991). Clearly not everything could be measured and some measures were chosen because they were relatively short to administer or complete. A range of measures was used for assessing ADHD, coexisting behaviour problems, and cognitive ability, as well as several parent and family factors such as parental acceptance, socio-economic status, quality of family relationships and family composition. Outcome measures for behavioural interventions usually do not include performance on cognitive tasks such as the Continuous Performance Test, however it was included here as it is frequently used in studies comparing ADHD children with non-ADHD children and for evaluating the effectiveness of medication (Bergman, Winters, & Cornblatt, 1991).

Medication level. Schleifer et al. (1975) found that 89% of the participants in their study opted not to continue with medication after treatment because of medication side effects. Barkley et al. (1984) suggested that a moderate dose between the levels used in their study, such as 0.3mg/kg, would be preferable as the higher dose produced significantly more side effects. Musten et al. (1997) support the practice of using 0.5mg/kg of methylphenidate as the preliminary dose because of overall positive effects at this dose, even though parents reported significantly more and more severe side effects at the higher dose compared with the other conditions. Werry (personal communication, August 10, 1996) suggested a conservative dose of 0.3mg/kg as most appropriate for young children. Methylphenidate was chosen as it is the most frequently prescribed stimulant medication in this country and has been used most often in clinical research in other countries. Based on the above considerations, the dose was set at 0.3mg/kg.

Parent training programme. The parenting programme used in my study was based primarily on four other programmes: (a) Anastopoulos and Barkley's (1990) programme which is specifically tailored to meet the special needs of children with ADHD and their families; (b) Barkley's (1987) programme in which parents receive training in the management of children with problem behaviour; (c) Eyberg and Bogg's (1989) parent-training programme for young children with oppositional-defiant behaviour; and, (d) the work by Campbell (1990) on developmental and clinical issues regarding behaviour problems in young children. The programme also used information handouts and record charts from Braswell and Bloomquist (1991).

Anastopoulos and Barkley's (1990) training programme is an amalgamation of several theoretical and empirical influences. The first of these is based on Hanf's

(1969) two-stage behaviourally oriented programme for childhood non-compliance, that works with the parent and child together and provides direct coaching of parenting skills. Parents first learn how to attend to their child's independent play positively, how to reinforce compliance and other appropriate behaviours, and how to ignore inappropriate behaviours and then learn to use time-out from reinforcement for target behaviours such as non-compliance. This particular combination of positive attending and punishment strategies has been well researched with children of a variety of ages and found to be effective in significantly reducing non-compliant and defiant behaviour as well as increasing child compliance and co-operation (e.g., Eyberg & Robinson, 1982; Forehand & McMahon, 1981; Pisterman et al., 1989). The second major influence is Bell's theoretical notion of bi-directional parent-child interactions (Bell & Harper, 1977). Bell's work highlighted the reciprocal contribution of intrinsic child characteristics with child behaviour and the shaping of parental reactions and management style. This notion of reciprocity also is consistent with Patterson's (1976) theoretical views on coercive parent-child interactions.

Eyberg and Boggs' (1989) programme is based on parent-child interaction therapy that retains features of Hanf's model while also emphasising play therapy techniques and problem-solving skills training, consistent with social-learning theory. According to Eyberg (1988, p.35), play is the primary medium through which children develop problem solving skills and work through developmental problems. Parent-child interaction therapy assumes that oppositional behaviour is established and/or maintained by the child's interaction with the parent. Creating or strengthening a trusting, warm relationship between parent and child is assumed to have a positive effect on the child's behaviour. The overall programme is conducted within the

context of natural play situations. The two basic phases of treatment are child-directed interactions in which the parent is taught non-directive interaction skills and parent-directed interactions in which methods of incorporating clearly communicated and age-appropriate instructions are taught so as to provide consistent and positive or negative consequences. Specific goals of the programme are to teach parents to build a warm and mutually rewarding relationship with the child, to teach the child desirable prosocial behaviours and to decrease the child's inappropriate behaviours.

Campbell's (1990) work incorporates both a transactional model of development as outlined by Sameroff (1975) and an ecological model that involves the broader social context. Several basic premises underlie the transactional view of development that incorporates organismic and environmental determinants in continual and mutually interactive flux over time. Development is assumed to be discontinuous and characterised by qualitative change and reorganisation. The child is seen as an active organiser of experience, participating in his or her own development. Interactions between the child and caretakers are viewed as bi-directional and neither child characteristics nor environment are considered static. There is a strong biologically based self-righting tendency in which children move toward "normal" development (see Campbell, 1995 for review of research).

Non-compliance or oppositional behaviour is most often the focus of intervention in the programmes discussed previously. As outlined by Barkley (1987), this occurs for a variety of reasons: (a) it is often the most frequent complaint as parents are concerned about the child's inability to comply with directions, commands, rules or codes of social conduct; (b) it underlies a majority of negative interactions between family members and the referred child; (c) it is more pervasive than other

behavioural problems; (d) it may have indirect effects on family functioning that subsequently lead to further detrimental effects on adjustment of the child; (e) it is a significant predictor of other problems; and (f) unless the child can comply with requests, training or intervention in other areas may not be successful.

Although the use of spanking (smacking) has been advocated as part of the punishment procedure in some of the programmes outlined above, usually as a backup contingency for inclusionary time-out strategies, (e.g., Barkley, 1987; Eyberg & Boggs, 1989), it has been specifically excluded from the parent training programme used in the present study. In their study of New Zealand families, Ritchie and Ritchie (1981) found that both parents and young adolescents (i.e., 12- and 13-year-olds) agreed that physical punishment was an ineffective method of changing behaviour, nevertheless, parents continued to smack their children and children continued to expect to be smacked. Ritchie and Ritchie described physical punishment as “crude as well as cruel; it is a blunt and ineffective instrument of control” (p. 26). Straus (1994) contended that children who are spanked quickly learn that love and violence can go hand in hand. In reviewing studies concerned with corporal punishment conducted over the past two decades, Straus found that children who were spanked were two to six times more likely to be physically aggressive, to become juvenile delinquents and later as adults to use physical violence against their spouses, to have sadomasochistic tendencies and to suffer from depression.

While the use of aversive techniques such as smacking have been specifically excluded from the present study, time-out procedures (using a time-out chair and then removal from room, if required) were presented in this study (see Method for full details). The procedures follow Guidelines for Psychologists on applying punishment,

aversion therapy and time-out procedures (approved by Council of the NZPsS, July 1979). The recent draft Code of Ethics (NZPsS, 1997) makes a general requirement that practitioners select the most effective intervention under the particular circumstances and with full regard to all known undesirable side effects. Practitioners are responsible for fully informing clients of all aspects of the services offered and obtain their consent to participate and remain in interventions. With regard to this ethical implication for using placebo conditions, it is not necessarily known if the placebo is less effective than the active intervention. Although receiving a placebo may not have a harmful effect, it also might not have a positive one. Participants are fully informed of the implications of participating in the research and that they are free to withdraw their participation at any time.

The overall approach promoted in the parent training programme was a positive one, focussing on education, provision of information and ways to help parents generate positive interactions and feelings about their children and acceptance of their children. This is in keeping with the view that positive programmes can always make it unnecessary to resort to using aversive interventions other than things like withdrawal of positive attention, verbal reprimand, or restricted access to preferred activities and materials (e.g., Donnellan, LaVigna, Negri-Shoultz, & Fassinbender, 1988; Lutzker, 1996; Meyer & Evans, 1989). Furthermore, the general approach tried to go beyond standard behaviour management procedures and incorporate interactive and co-operative strategies. Malins (1997), for example, found that a standard behaviour management programme and one that gave mothers interactive strategies sensitive to their child's needs and abilities were both quite effective in reducing targeted behaviour problems. But it was the latter programme

that had a positive impact on the mothers' feelings about and relationship with their children (Malins & Evans, 1998).

In devising this parent-training programme, it was important to include information on normal development to provide parents with some objective point of reference with which to gauge their child's behaviour and development, as well as their expectations of the child and themselves as parents. From a clinical standpoint, the focus on a "problem" often overshadows what is typical in child (and parenting) development. For young children, the focus of parental expectations of the child shifts to demands for greater self-control and the ability to play co-operatively with other children together with advances in cognitive abilities (Campbell, 1990). Developmental processes also are presented with reference to the work by MacDonald (1990) including partnership between parent and child, matching, responding to the child's developmental level, child-based direction, and emotional attachment.

METHOD

Setting

All parts of this study were conducted at the Child Development Centre at Waikato Hospital. The Centre is located in the city of Hamilton in the North Island of New Zealand. It is the largest inland city with a population of about 150,000 people. The Centre provides a multidisciplinary service for children (and their families) aged from 0 to 16 years with developmental and/or severe behavioural problems and who live in the Midland/Waikato Region (total population base of approximately 700,000). Children are seen on the basis of referral which can be made by any health or education specialists such as medical specialists, general practitioners, teachers (pre-school and school teachers), Plunket and public health nurses. All referrals are presented at a weekly team meeting; the key problems are identified and, based on the nature of the problems, the client is assigned to a key worker (e.g., paediatrician, speech language therapist), to a clinic (e.g., encopresis clinic, enuresis programme) or for an individual developmental assessment. Typically, there is a 2 to 6 month wait before the client is seen, except in urgent situations. Referrals that do not meet the Centre's entry criteria are either returned to the referrer or referred on to an appropriate agency.

Participants

All participants were drawn from consecutive referrals to the Centre. Twenty children and their parents participated in the present study, however four were subsequently excluded because of treatment integrity problems. The remaining 16 children, 3 girls and 13 boys, were aged between 3 and 6 years (mean age = 4.78). Full details about the participants are provided in the following sections.

Participant Selection

Figure 1 shows the protocol I established to obtain participants from within the general referral process already established at the Centre. Children aged between 3 and 6 years who had been referred to the Centre with attentional and/or hyperactivity problems were assigned to be seen by a paediatrician and placed on the waiting list (as is usual), and were then invited to participate in the study. If they declined or could not be contacted, they still remained on the list for services from the Centre. If the referring agent had indicated that there were developmental issues (e.g., developmental delay, speech problems) or complex family/social circumstances, the child may have been seen first for a developmental assessment or assigned to another staff member, such as the social worker. Occasionally, children had already been seen by a paediatrician or social worker and if they presented with the key problems being addressed in this study they were then referred to me, via the team meeting, for possible inclusion in the study.

The parent/caregiver of the child was sent an information sheet with details of the research (Appendix A). Several days later, the parent was contacted by phone and invited to meet to discuss the study. If the parent did not have a contact phone number, he or she was asked in the letter to contact me. An initial appointment was arranged to meet with the parent and to discuss the research in more detail. Parents were provided with written information on compensation for injury during the study (they would be participating in what was defined as a clinical trial), general conditions of participation and a consent form (Appendix B). If the parent consented to participate, another appointment was arranged for an assessment with the child. The parent was given several forms to fill in as well as forms to be completed by the child's

teacher (kindergarten or school) or daycare/crèche worker. If the child was not attending a pre-school/school facility, another family member, who did not live in the same house as the child but who was familiar with the child, completed the forms. This was usually a grandparent or aunt.

Inclusion criteria. Children and their parents who participated in the study had to meet several inclusion criteria. The children had to be aged between 3.0 and 5.9 years and residing with a primary caregiver for at least 6 months. They had to meet diagnostic criteria for ADHD as defined in the *DSM-IV*. This was primarily determined on the basis of rating scales completed both by parent and teacher (or other family member, not living with child). The child had to have features of ADHD for at least 12 months and to a degree that was considered to be developmentally inappropriate. Six of the nine items had to be endorsed from either the Inattention list or Hyperactivity-impulsivity list. The type of ADHD depended on whether criteria were met for either or both lists (i.e., Predominantly Hyperactive-Impulsive Type, Predominantly Inattentive Type or Combined Type). In addition, children had to be rated by either the parent or the teacher at or above the 93rd percentile on the Global Index subscale of the Conners' Rating Scales (see "measures" section).

Exclusion criteria. Exclusion criteria followed the general rationale provided by Hinshaw et al. (1997) as part of the National Institute of Mental Health, Multimodal Treatment Study of Children with ADHD. Their criteria were formulated on a functional basis, i.e., based primarily on a child's or family's inability to participate in intensive and extensive assessments and treatments. The exclusion criteria used in the present study are listed below:

1. Currently in hospital.

2. Currently in another treatment study.
3. Currently receiving treatment (e.g., stimulant medication or parenting group).
4. Below 80 on the Full Scale IQ of the Wechsler Preschool and Primary Scales of Intelligence-Revised.
5. Pervasive developmental disorder or psychosis.
6. Major neurological or medical illness that would interfere with participation or require medications incompatible with methylphenidate.
7. Chronic, serious tics or Tourette's Disorder.
8. History of child abuse.
9. Inability of parent to understand English.

Participant selection and assessment process. Figure 1 illustrates the overall procedure and sequence for participant selection and assessment method and Figure 2 shows the number of referrals, people contacted and assessments conducted to obtain the sample used in the study. The assessment process followed part of the general outline of practice parameters for the assessment and treatment of children, adolescents and adults with ADHD. It includes an interview with parents to obtain child and family history, the use of standardised rating scales, school information, physical evaluation, referral for additional evaluations if required, and observation of child and family interactions and behaviour (AACAP, 1997, pp.109-111). Figure 3 presents the protocol for administration of measures throughout the course of the study. Details of all measures are provided in the next section. Psychometric properties of the tests and scales are provided in Appendix H.

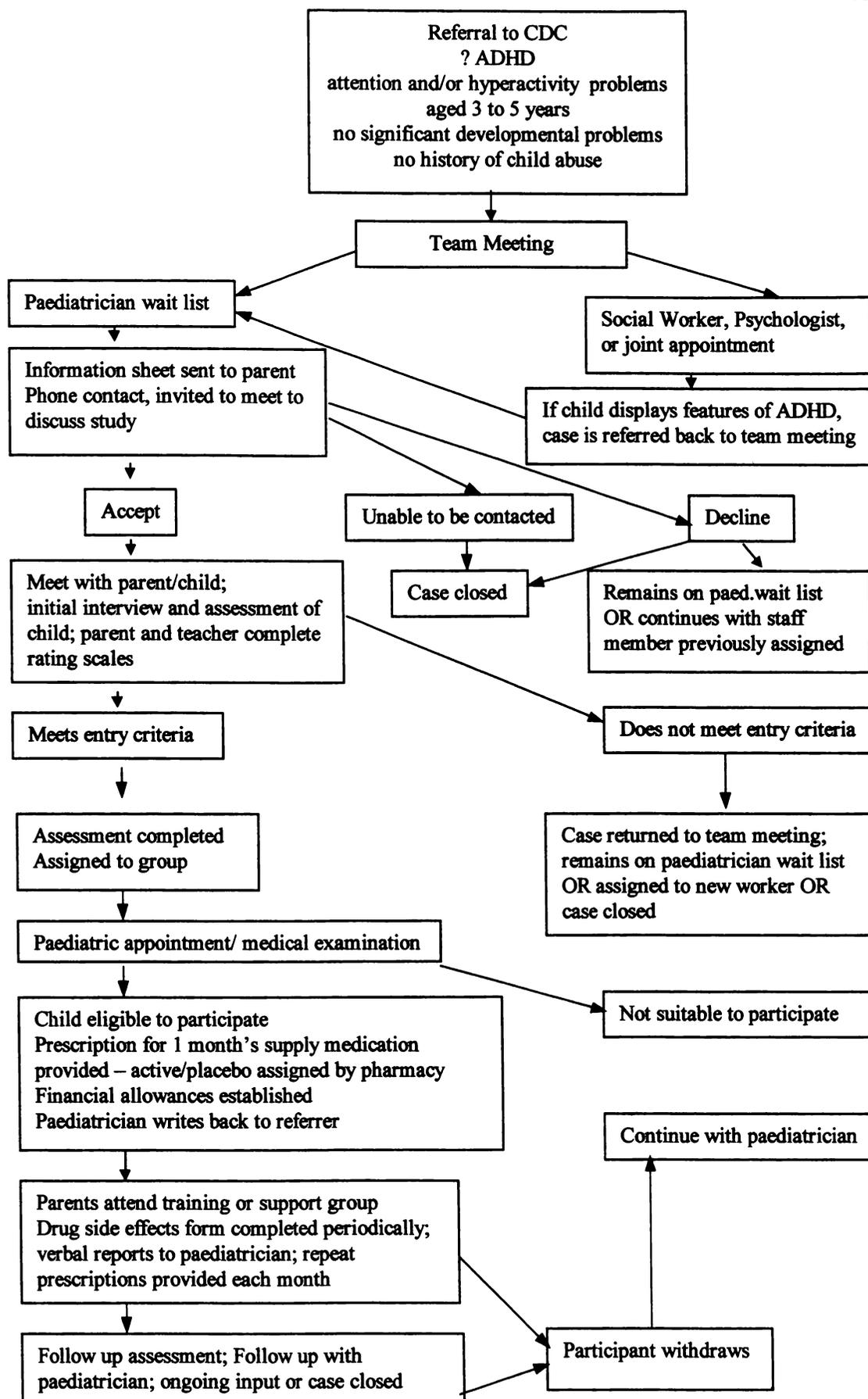


Figure 1. Flow chart of participant selection and assessment procedures.

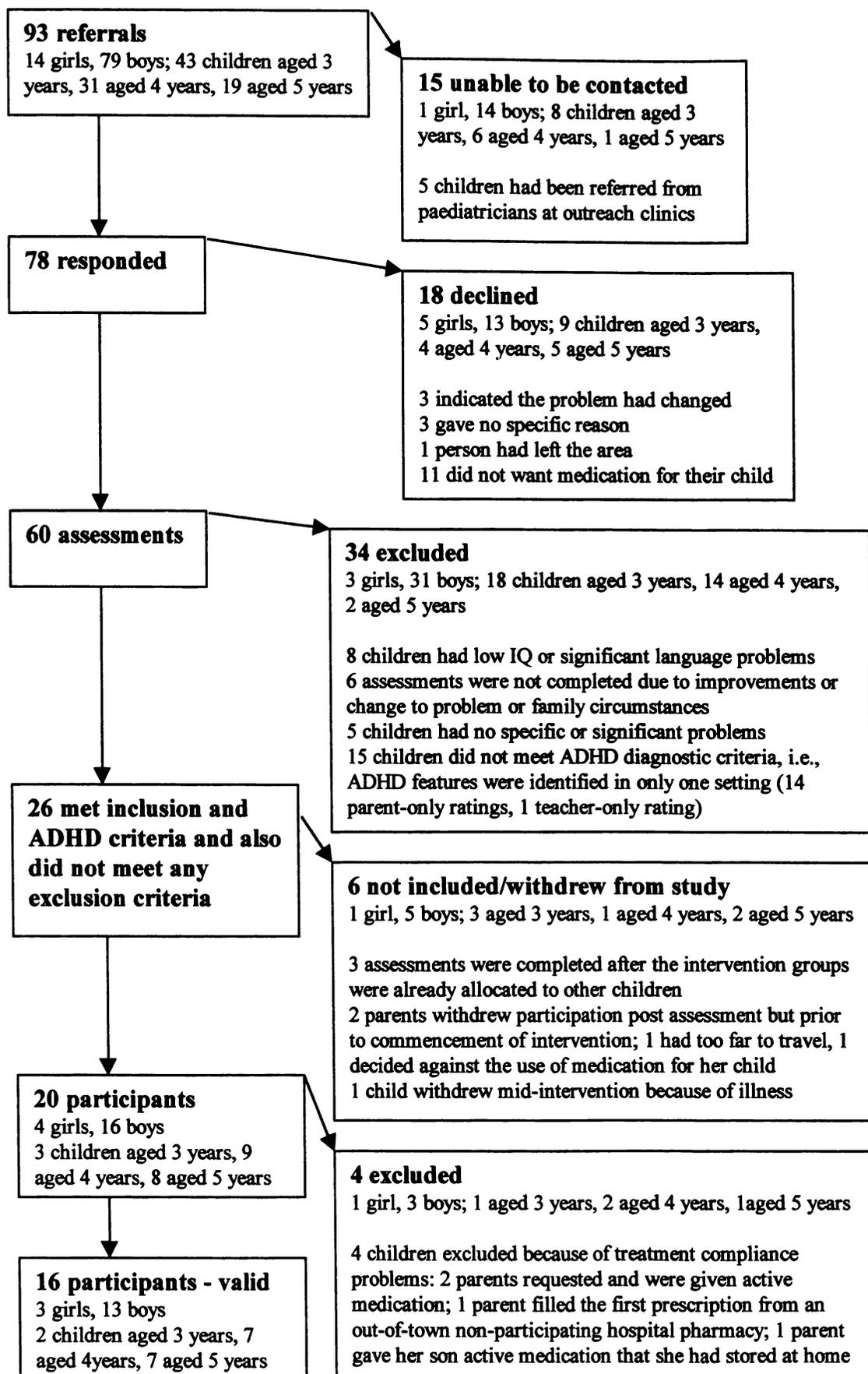
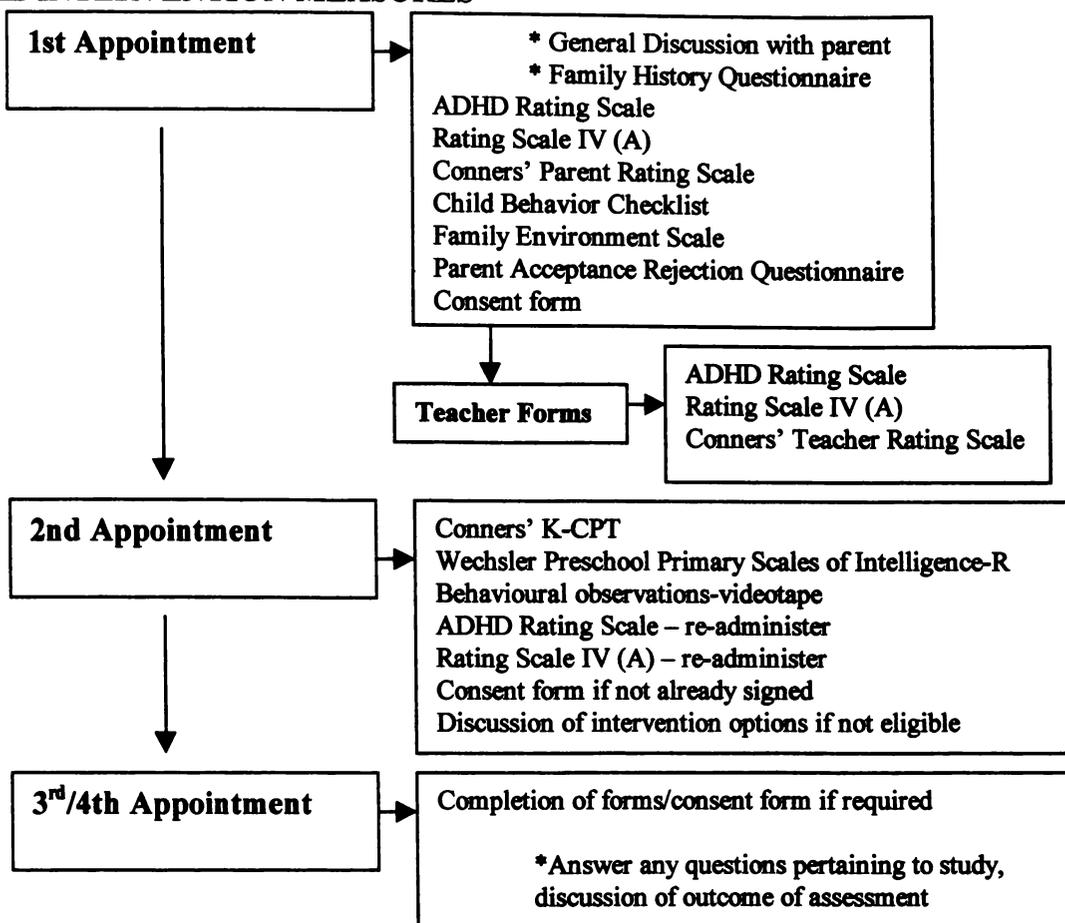


Figure 2. Flow chart of participant selection process.

PRE-INTERVENTION MEASURES**DURING-INTERVENTION MEASURES**

Side Effects Form
 ADHD Rating Scale – fifth session
 Rating Scale IV (A) – fifth session

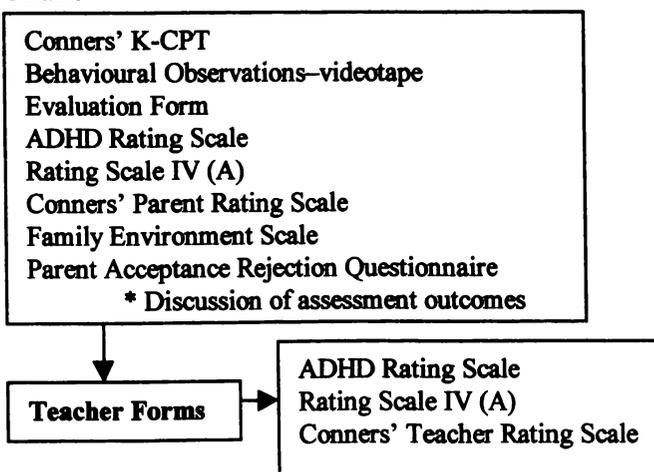
POST-INTERVENTION MEASURES

Figure 3. Administration of measures throughout the course of the study.

Measures

1. Family history/Developmental questionnaire (Appendix C).

This questionnaire provided the basis for the initial interview with the parent and was devised from similar interview schedules such as the ADHD Clinic Parent Interview (Barkley, 1990) and the University of Irvine Child Development Center Medical Schedule. The following information was obtained from the parent:

- (a) General details about the child and parents, including address, phone number, ethnicity, and child's date of birth, name of referrer and reason for referral.
- (b) General information about the parents and family including the names and ages of parents with whom the child was living, highest educational level of parents, usual occupation used for rating socio-economic status (see below), marital status of parents, names and dates-of-birth of siblings, people living with the child, and details of any major medical, learning or emotional problems in other members of family.
- (c) Developmental factors including information on prenatal, perinatal, postnatal and infancy periods and achievement of developmental milestones.
- (d) Medical history.
- (e) Social/educational factors.
- (f) Current concerns about the child's behaviour.

Socio-economic status was derived from The New Zealand Socio-economic Index of Occupational Status (NZSEI) (Davis, McLeod, Ransom, & Ongley, 1997). The NZSEI was transformed into six discrete occupational classes and split in such a way as to ensure that each class consisted of a reasonable proportion of the population. Class 1 is the highest socio-economic group and class 6 is the lowest group. In the present study, the rating for socio-economic status was derived from the

occupation with the highest rating if both parents in a two-parent family were working. If the parent in a single-parent family was not currently working, the rating was based on their last or usual occupation, and if the parent had never worked since leaving school the lowest rating was given.

2. ADHD Rating Scale-IV; Parent and teacher versions.

These rating scales were devised by DuPaul, Power, Anastopoulos, and Reid (1998) and are based on the *DSM-IV* diagnostic criteria for ADHD. Eighteen scale items were written to reflect *DSM-IV* criteria with the primary change of omitting the word “often” from the description. Parents and teachers were instructed on the form to indicate the frequency of the listed behaviours for the child over the past 6 months (or since starting at pre-school/school if the teacher had known the child for less than 6 months), and they were asked to verify that the behaviours had been problematic for at least 12 months in keeping with the recommended practice for younger children (Barkley, 1998a). Parents were instructed to rate the behaviours from 0 (never or rarely) to 3 (very often). All odd-numbered items relate to behaviours associated with inattention and all even-numbered items relate to hyperactive-impulsive behaviours. Examples of odd-numbered items included: “Does not seem to listen to when spoken to directly” (Item 5); “Avoids tasks that require mental effort” (Item 11); “Is easily distracted” (Item 15). Examples of even-numbered items include: “Fidgets with hands or feet or squirms in seat” (Item 2); “Is on the go or acts as if driven by a motor” (Item 10); “Has difficulty awaiting turn” (Item 16). As previously discussed in the “inclusion criteria” section, rating 6 out of 9 items as problems on either (or both) the odd- or even-numbered items is indicative of ADHD, assuming other criteria are met (the number of these items is used to identify the type of ADHD).

Items scored as 2 (often) or 3 (very often) are included as “symptoms”, i.e., problematic. The scale yielded six measures: (a) total score, (b) total number of problems, (c) inattention score, (d) number of inattention problems, (e) hyperactive-impulsive score, and (f) number of hyperactive-impulsive problems. As recommended when using rating scales in drug trials, the second administration was used as the baseline measure (Aman, 1993; Barkley, 1990). This recommendation was carried out for the parent versions on this measure and on the Rating Scale IV (A) (see below). The scale was re-administered to parents after the fifth session and to parents and teachers at post-intervention. Standard errors of difference for both versions of the scale for the 5- to 7-year-old grouping for boys and girls were used in calculating a Reliable Change Index (Jacobsen & Truax, 1991).

3. Rating Scale IV (A); Parent and Teacher versions.

These scales were arranged in a similar way to the ADHD Rating Scales and are based on *DSM-IV* diagnostic criteria for Oppositional Defiant Disorder. Examples of items are: loses temper, argues with adults, deliberately annoys people, angry and resentful. There are no normative data for these scales. Parents and teachers were asked to indicate the frequency of the child’s behaviour over the past 6 months, rating from 0 (never or rarely) to 3 (very often). Items scored as 2 (often) or 3 (very often) are included as “symptoms”. Based on *DSM-IV* diagnostic criteria, four or more problems (i.e., four items scored as 2 or 3) are indicative of Oppositional Defiant Disorder. The scale yielded two measures: (a) total score, and (b) number of problems. If the parents and the teacher rated four or more items as problematic on this scale and either the parents or the teacher scored above the 93rd percentile on the

Oppositional subscale of the Conners' Rating Scale (see below), the child was classified as also having Oppositional Defiant Disorder.

4. Conners' Parent Rating Scale-Revised: Long Version, CPRS-R:L, Conners' Teacher Rating Scale-Revised: Long Version, CTRS-R:L (Conners, 1997).

These scales are often used in the assessment of child behaviour problems and contain information that corresponds to the ADHD diagnostic criteria in the *DSM-IV*. The long versions were administered to provide more extensive information that might be of benefit in the clinical situation. The subscales (l), (m) and (n) relate directly to *DSM-IV* criteria for ADHD and were used to match with ratings derived from the ADHD Rating Scale. The long versions take approximately 15 to 20 minutes to complete. Parents and teachers were instructed to rate each item according to how much of a problem each behaviour had been in the last month, rating from 0 = not true at all (never, seldom) to 3 = very much true (very often, very frequent). A raw score was obtained for each subscale and was then converted to a *T*-score ($M = 50$, $SD = 10$). Both versions were administered pre- and post-intervention. Scores from two subscales were used in this study: (a) Oppositional, and (b) Conners' Global Index Total. The items in the Oppositional subscale relate to the child being likely to break rules, having problems with authority and being easily annoyed. As explained previously, the score on either the parent or the teacher version of this subscale was used in conjunction with the number of items scored as problematic in the Rating Scale IV (A) to indicate Oppositional Defiant Disorder. In addition, pre- and post-intervention *T*-scores were used in the analyses. The *T*-scores for the Conners' Global Index Total also were used in the analyses. This subscale relates to general problematic behaviour, including "hyperactivity", and has previously been known as

the “Hyperactivity Index”. It has been used extensively in research on ADHD. To be included in this study all children had to have a rating from either the parent or teacher at the 93rd percentile or greater on this measure.

5. Child Behavior Checklist/2-3; CBCL/2-3 (Achenbach, 1992), and Child Behavior Checklist/4-18; CBCL/4-18 (Achenbach, 1991).

The Child Behavior Checklist (CBCL) is a standardised form for assessing children’s behavioural and emotional problems. Two versions of the CBCL were administered in this study: (a) the CBCL/2-3 is a 100-item form used for children aged less than 4 years; and, (b) the CBCL/4-18 is a 118-problem-item form used for children aged 4 years and over. Administration of the forms takes approximately 10 to 15 minutes to complete. Parents were instructed to rate the child on each item that described the child now or within the previous 2 months for the CBCL/2-3 or over the previous 6 months on the CBCL/4-18. Items are rated from 0 (not true) to 2 (very true or often true) of the child. Scores were derived following the instructions provided in the manuals for the CBCL/2-3 (Achenbach, 1992, pp.185-186) and the CBCL/4-18 (Achenbach, 1991, pp.249-251). All raw scores were converted to *T*-scores. *T*-scores between 67 and 70 are classified as borderline; *T*-scores above 70 are classified as in the clinical range; and, *T*-scores less than 67 are classified as within the normal range. Three *T*-scores were yielded for each child: (a) Internalizing *T*-score, (b) Externalizing *T*-score, and (c) Total Problem *T*-score. These *T*-scores were not used in the analyses, however a severity score was obtained for each child on the basis of the Total Problem *T*-score ≥ 70 . In addition to the ratings, parents were asked to respond to “What concerns you most about your child?” and “Please describe the best things about your child.” This provided additional qualitative information.

6. Family Environment Scale-Real and Ideal Forms (Moos & Moos, 1994).

The Family Environment Scale is 1 of 10 Social Climate Scales. It consists of 90 items that yield 10 subscales that measure the actual (Real), preferred (Ideal) and expected (Expectations) social environment of families. Each subscale consists of nine items. The first two forms were used in this study. Both forms use a two-point answer format, i.e., true-false. While every effort was made to get parents to respond in this way, some of them scored items at the halfway point. These items therefore were scored as 0.5. Raw scores were obtained for each subscale and then converted to standard scores ($M = 50$, $SD = 10$). Both forms of the Family Environment Scale use the same answer sheet, scoring template, and profile form. The Real form was administered pre- and post-intervention and the Ideal form was administered only at pre-intervention. The Family Relationships Index score was used in the analyses. This is a composite score, based on raw scores, measuring the quality of relationships within the family. A high score indicates high cohesion, high expressiveness and low conflict and a low score reflects the opposite.

7. Parent Acceptance Rejection Questionnaire - Parent version (Rohner, 1980).

The Mother Parental Acceptance-Rejection Questionnaire form was used in this study and administered pre- and post-intervention. Mothers were asked to rate 60 items from 1 (almost never true) to 4 (almost always true). Seven items in the neglect/indifference scale are reverse scored and in the total (composite) score, all items in the warmth/affection scale are reverse scored so that a high score indicates minimum perceived warmth/affection (i.e., maximum perceived rejection). Examples of items include: "I say nice things about my child" (Item 1, warmth/affection scale); "I wonder if I love my child" (Item 4, undifferentiated rejection scale); "I am irritable

with my child” (Item 27, hostility/aggression scale); “ I pay a lot of attention to my child” (Item 35, indifferent/neglect scale).

Although Rohner (1980) recommended that each of the four scale scores be converted to a z-score before summing the scores to form a total (composite) test score and before performing any subsequent statistical operations, this was not possible for the “Mother form”; the raw score from the total score was used in the analyses.

8. Behavioural observations of parent/child interaction-compliance task.

The coding system used for recording parent-child interactions in my study was adapted from Barkley (1987). All observations were carried out in the playroom at the Child Development Centre. The room has a one-way mirror and hidden microphone with an adjoining observation room in which the videoing of the interactions was conducted. The parent and child could not see or hear through to this room while they were being videotaped, however they had been shown and/or had been in the observation room prior to the play session (e.g., during the initial interview, completing forms, observing the child’s assessment). The playroom contains a variety of toys such as dolls, blocks, pram, doll’s bed and tea set, as well as a small table and chairs, a blackboard, a mirror, a sink and a set of three stairs leading to the windows. The parent (usually the mother) and child were taken to the playroom and told to play as they might do at home. This interval lasted for a few minutes and served as a habituation period to the playroom. Interactions during this period were not coded. The parent was provided with a written list of 10 age-appropriate tasks that they were to ask the child to perform after the habituation period. Behaviour in this situation was videotaped for 10 minutes. The tasks used for

these observations of parent-child interactions and compliance/non-compliance were adapted from Barkley (1987, p.37): (a) Stand up please; (b) Open the door; (c) Give me one of those toys; (d) Put all the toys in the box; (e) Put the toys and the box on the bookshelf; (f) Put the small chairs under the table; (g) Take off your shoes; (h) Wipe the table with this cloth; (i) Put these pegs into the holes; and (j) Put your shoes on. The number of commands varied between parents, as some of the parents did not give the child all of the tasks on the list. Although parents were told to spread the tasks over the 10-minute session, some parents just read the items on the list, one after the other, and the child finished all the tasks in a few minutes.

All videotapes were viewed and coded at a later stage. The observer recorded what the parent did, what the child did in response to the parent's commands and the parent's reaction to the child's behaviour. Details of the coding procedure and behavioural categories are provided in Appendix D. The behavioural categories were: (a) original command, (b) repeat command, (c) child compliance, (d) child non-compliance, (e) child negative, (f) parent approval, and (g) parent negative. The coding yielded six measures: (a) number of parent commands per minute, (b) number of repeat commands per original command, (c) percentage of child compliance (i.e., number of compliance divided by the number of commands), (d) percentage of child negative per command (i.e., number of child negatives divided by the number of commands), (e) number of parent approvals per minute, and (f) number of parent negatives per minute. At the end of this section, videotaping continued for the attentional behaviour task.

9. Behavioural observation of parent/child interactions-attention task.

The coding system used for direct observation of attentional behaviour in the present study is based on a modified version of Barkley's ADHD Behavior Coding System, Restricted Academic Situation (see Barkley, 1990). The parent asked the child to either sit on the floor and read a book together or sit at the table and draw a picture. This task followed the 10-minute compliance task and was videotaped as described above. The task lasted for 5 minutes and was coded in 10-second intervals (Appendix D). Behaviour was coded using five behavioural categories: (a) off-task, (b) fidgeting, (c) vocalising, (d) playing with object, and (e) out of seat. Details of the behavioural categories are provided in Appendix D. Six measures were scored: (a) percentage of occurrence for each behaviour category (i.e., total number of intervals scored for each category/total intervals $[30] \times 100$), and (b) total percentage of occurrence for all behaviour categories combined (i.e., total number of intervals scored/total intervals $[150] \times 100$).

10. Interobserver reliability.

An independent observer (Observer 1) who was skilled in behavioural observations and who was unaware of the intervention status of each participant was trained over two sessions. Definitions of coding categories and coding sheets were discussed and the observer received training on two sample tapes until there was at least 80% agreement on scores. Coding categories, particularly the definition of repeat commands, were revised after the first four recordings had been coded. A random sample of tapes was coded independently to obtain an indication of reliability; I (Observer 2) coded 25% (8/32) of the compliance task recordings and 25% (8/32) of the attentional behaviour recordings. Agreement on one of the recordings was well

below 50% and was recoded. Interobserver reliability results for both behavioural observation tasks are presented in the Results.

11. Wechsler Preschool and Primary Scale of Intelligence-Revised.

This an individually administered clinical instrument for assessing the general intellectual abilities of children aged from 3 years through to 7 years 3 months (Wechsler, 1989). The general rules for administering, recording and scoring the Wechsler Preschool and Primary Scale of Intelligence-Revised were followed as indicated in the test manual. While the standard and preferred order for administration of subtests involves alternating between performance and verbal subtests, it was not always possible to keep to the standard order with the children who participated in the study. Administration of the subtests (and sometimes items in and between subtests) was varied to maximise the chance of keeping the children on task for the period of testing, i.e., whatever subtest seemed most appealing to the child and would keep them in their seat was used at the time. I tried to make the assessment as much fun as possible so that children would view it as a play activity rather than a test. All raw scores were converted to standard scores. Occasionally, less than five Performance subtests or five Verbal subtests were administered and the scores were prorated to obtain final scores. This test yielded three measures: (a) Performance Scale IQ, (b) Verbal Scale IQ, and (c) Full Scale IQ.

12. Conners' Kiddy-Continuous Performance Test - Multi-Health Systems (1996).

The Conners' Kiddy Continuous Performance Test is a computerised vigilance or attention test designed specifically for 3- to 5-year-old children. This test is similar to standard versions of the Continuous Performance Test (e.g., Gordon, 1983), however it is shortened to seven minutes (about half the time of standard versions) and

pictures rather than letters are used to ensure that children are able to discriminate among the stimuli. Children have to press the spacebar on the keyboard or click the left mouse button for all pictures (hand, bicycle, boat, car, fish, horse, house, telephone, scissors, train) that appear on the screen, except for the picture of the ball. The test yields several measures: (a) percentage Hits, (b), percentage Omissions, (c) percentage Commissions, (d) Overall Reaction Time, (e) Hit Reaction Time, (f) Commission Reaction Time, and (g) Hit Reaction Time Standard Error. Only percentage omissions and percentage commissions were used in the analyses.

At the time of my study, normative data were being collected for the Conners' Kiddy-Continuous Performance Test. The publishers (Multi-Health Systems Inc.) provided me with a free copy of the test and questionnaires in return for assisting them with normative data collection. Permission to test children on the Conners' Kiddy-Continuous Performance Test was obtained from the University of Waikato Department of Psychology Ethical Review Committee and the General Manager for the Central North Island Free Kindergarten Association (Appendix E). Forty-seven children aged 3 and 4 years, from three kindergartens in the region participated in this project. Parents were provided with an information sheet and invited (i.e., their child) to participate; some parents also were asked to complete the Conners' Parent Rating Scale-Revised: Long Version (Appendix E). These data were sent to Multi-Health Systems Inc. as part of the total normative data for the test (which is still being finalised). In addition, the data collected here provided some indication of the expected performance by New Zealand children. They are presented in Appendix Table H1, along with additional information on the outcomes from the data collection.

Administration of the Conners' Kiddy-Continuous Performance Test, in both the present study and the normative data collection, followed the recommended procedure. The task was introduced to child by saying "Now we are going to play a game on the computer. Some pictures are going to come up on the screen. Every time you see a picture, I want you to press the button/spacebar like this (demonstrated). Do this for all of the pictures, except for the ball. When you see a ball, don't press anything. Okay? First we are going to practice for a few minutes and then we are going to play the real game." All children were given a short practice session in which they were praised for responding appropriately or reminded of the instructions if they performed the task incorrectly, such as "Remember, press the bar for all the pictures, except for the ball". Once the practice session was completed, demographic information was entered and the instructions were repeated to the child before beginning the 7-minute test. The test in the present study was administered in the playroom on a portable computer. The test was administered to the child pre- and post-intervention. Post-intervention testing occurred when the parent group programme was completed and approximately one to two hours after the child had taken either the morning or lunchtime medication/placebo dose.

13. Stimulant drug side effects rating scale.

This scale was devised by Barkley (1990) and is used to assess the quantity and severity of possible side effects. It lists the most common side effects associated with stimulant medication. The parent is instructed to rate various behaviours and problems from 0 (absent) to 9 (serious), over the past week. There are 17 items in total and include problems such as trouble sleeping, nightmares, and decreased appetite. The scale was administered to monitor possible side effects as part of the

requirement for management of medication use and dosage; ratings were not used in the analyses. The child was referred back to the paediatrician or advice was sought from the paediatrician if a child developed significant side effects. This happened once during the study and occurred when the child contracted varicella zoster virus (Chicken Pox). The medication was stopped for 10 days and then resumed with no subsequent problems.

14. Procedural reliability checklist (Appendix F).

To monitor treatment integrity, a checklist was designed for each of the main areas covered in each step of the parenting programme. Several Psychology graduate students, enrolled in the Post-Graduate Diploma of Clinical Psychology at the University of Waikato, attended some of the group sessions and checked whether the area had been covered, moderately covered or not covered. If an area was not covered or only moderately covered in the parent training programme, we went over it in the next session; this ensured that all steps in the programme were carried out adequately and that the training groups received the same information and generally in the same order.

The same checklist was used for the support groups to ensure that only minimal information was presented to the parents in these groups and that key training areas were not covered or presented. I completed the forms when there was no student attending the group session. All components (i.e., 100%) were covered in each of the parent training groups. Twenty-five percent of the components were covered in the support groups; these primarily included components in Step 1 (information on normal child development, specific issues pertaining to ADHD and

handouts) as well as review of issues since the last meeting in several sessions and the video in Step 5.

15. Programme evaluation form (Appendix G).

The evaluation form is a modified version of the Parent's Consumer Satisfaction Questionnaire used by Forehand and McMahon (1981) as part of the evaluation of their treatment programme. Parents were asked to indicate on a 7-point rating scale their evaluation of the overall programme, the usefulness and difficulty of the teaching format and specific parenting techniques, and the performance of the therapists. There also is a section asking what the parent liked and disliked about the programme, what they found most and least helpful and any other general comments. The form used in my study was designed with a similar format to that used by Forehand and McMahon (1981), however the questions were tailored to the areas and themes covered in the programme. The form yielded measures on evaluation of the total programme and the sessions for both types of parenting group and information on session format and parenting techniques for the groups receiving the behaviour management programme. Parents also were invited to write about anything else that they liked or disliked about the programme or their group and this also was examined.

Dependent Variables

In summary, there were 35 dependent variables: 6 from ADHD Rating Scale-Parent version; 6 from ADHD Rating Scale-Teacher version; 2 from Rating Scale IV (A)-parent version; 2 from Rating Scale IV (A)-teacher version; 2 from Conners' Rating Scale-Parent version; 2 from Conner's Rating Scales-Teacher version; 2 from Conner's Kiddy-Continuous Performance Test; 1 from Parent Acceptance Rejection Questionnaire (total score); 1 from Family Environment Scale (Relationship Index); 5

from behavioural observations of parent-child interactions during compliance task; and, 6 from behavioural observations of parent-child interactions during attentional behaviour task.

Design

The present study used a randomised between-groups, multiple-blind design to compare four conditions. There were four compound treatments made up from two active components (0.3mg/kg methylphenidate and parent training programme), and two related placebo components (identical sugar tablets and supportive non-training parent group). This yielded a 2 x 2 factorial design, with two levels of each factor, as shown below in Table 1.

Table 1

2 x 2 Factorial Design

		Behavioural factor	
		Parent training programme A:	Support group-placebo B:
Pharmacotherapy factor	1:	Group 1	Group 2
	2:	Group 3	Group 4

Treatment Group Assignment

Once the consent form had been signed and if the child met inclusion criteria, the child and parent were randomly assigned to one of four groups: A1 (Group 1), A2

(Group 3), B1 (Group 2), B2 (Group 4). A and B referred to the type of parenting group: A = parent training group, and B = parent support group. 1 and 2 referred to the medication status: 1 = active medication (methylphenidate), and 2 = placebo medication. Medication was prescribed at 0.3mg/kg taken in two doses, morning and lunchtime. To minimise the possibility of adverse side effects, the dose was built up over the first week so that by the end of the week children were receiving the full dose. Throughout the period of data collection, the participants and I did not know the code for the medication status; this was revealed at the end of the study. Details of how the blind procedure was handled are given in the general procedure below.

Random assignment of the sequence in which groups would be run was established at the beginning of the study; A1, A2, B1, B1, A2, B2, A1, B2. The first five children/parents were assigned to group A1, the second set of five children/parents were assigned to A2 and so on until the last (eighth) group of five who were assigned to B2. The aim was that the children, whose parents were in the same training or support group, would receive the same type of medication and there would be no need to fill more than one group concurrently. The order of group assignment was changed mid-way through the study because of low participant numbers and several participants withdrawing from the study (e.g., due to illness, deciding against using medication). The final sequence of groups was A1, A2, B1, B2, A2, B2.

General Procedure

As staff and clients of the Child Development Centre were involved directly in the present study, the paediatricians and Manager at the Centre were approached initially for their support of the research and comments and criticisms of the proposed

procedure. Written support was obtained and presented in the ethics applications. Staff at the hospital pharmacy also were contacted and sent an outline of the general procedure to obtain their support. Permission to conduct the study was obtained from the University of Waikato Department of Psychology Ethical Review Committee and the Waikato Ethics Committee for Waikato Hospital. General approval also was sought and obtained from an advisor in the Psychology Department on Maori issues to ensure the general protocol and parenting programme met cultural safety standards. A 45-minute presentation on the rationale for the study and proposed plan was given to the staff at the Centre during one of their half-day planning sessions. The staff were presented with a flowchart similar to that in Figure 1, as well as a list and explanation of the measures used in the study. Discussion was then held on the general procedure for referring children, setting up paediatric appointments, prescription details, letters to the referrers about the research project (written by the paediatrician) and follow up with Centre staff for children not eligible to participate in the study or those not wanting to participate. Ongoing discussions were held with key staff members during the course of the project to ensure they knew what to do and to keep them involved in the process. A brief written progress report was presented to the team halfway through the data collection as well as a one-hour presentation of findings when data collection and data analysis were completed.

The hospital pharmacy was responsible for assigning the medication status and informing the paediatricians whether the child was on active or placebo medication. In addition, the pharmacy was responsible for obtaining the placebo tablets and placing the medication, active or placebo, in the same type of containers. Placebo tablets come in loose packs whereas methylphenidate is supplied in a foil pack; staff had to

remove the methylphenidate tablets from the foil and place them in containers. Staff at the pharmacy were contacted regularly to ensure that there were no problems and to express gratitude for their participation, especially as they had to do tasks outside of their usual work requirements.

The initial part of the procedure (i.e., participant selection) has been discussed briefly earlier in this section; Figures 1 and 3 present details of selection and assessment procedures. Parents were first contacted by telephone and invited to come in for an initial interview and to discuss the study. Generally, the parent consented to participate at the first appointment and was given several forms to complete as well as forms for the child's teacher (kindergarten or school), daycare/crèche worker or another family member if the child was not attending a pre-school/school facility. The parent filled in the Family History/ Developmental Questionnaire, ADHD Rating Scale (Parent version), Rating Scale IV (A) (Parent version), Conner's Parent Rating Scale, Child Behavior Checklist, Family Environment Scale (Real and Ideal forms) and the Parent Acceptance-Rejection Questionnaire. The teacher completed the appropriate versions of the ADHD Rating Scale, Rating Scale IV (A) and Conners' Rating Scale. The parent versions of the ADHD Rating Scale and the Rating Scale IV (A) were re-administered prior to starting the parent groups and these data were entered as baseline data. These scales also were administered during the intervention (around session five) as repeated measures. It was not practical to re-administer the other rating scales.

The Family History/Developmental Questionnaire usually was completed during the initial interview and this gave me an opportunity to talk with the parent and for us to get to know about one another. Often the parent would bring their child

along to the first appointment. Although the children usually did not sit in during the entire interview, most of them were aware why they had come to the Centre and they were able to join in on some of the interview and to find out what was going to happen. A couple of children appeared to be upset that their parent was talking about them and their “naughty” behaviour. Meeting the child at the first appointment gave us an opportunity to talk about why they were there and to prepare them for the assessment activities that were going to occur at the next appointment.

A second appointment was arranged for the formal assessment tasks and behavioural observations with the parent and child. The Conners’ Kiddy-Continuous Performance Test was administered to the child, followed by administration of the Wechsler Preschool and Primary Scales of Intelligence-Revised. I administered both tests in the playroom at the Child Development Centre, while the parent observed through the one-way screen (in the observation room). As mentioned previously, I tried to make these activities as much fun as possible and referred to the tests as games. Children were allowed to wander around the room and play with other toys at any time. Most children seemed excited that their parent would have to go out to another room and that they would have an adult all to themselves. When the assessment was finished, the child had a short break (they usually had some refreshments) and then the parent joined the child in the playroom. By this time, the child was very happy to see their parent again. They were videotaped during compliance and attention tasks.

The initial appointment to discuss the study in more detail with the parent lasted approximately 1.5 to 2 hours. The assessment appointment usually lasted approximately 2 to 3 hours. A graduate Psychology student from the University of

Waikato assisted in some of the sessions to occupy the child (and siblings, extended family and/or friends) while the parent was being interviewed and to ensure that the tests were administered in the same order and in the standardised way. I scored and double-checked all ratings scales and tests. Twenty-five percent of these were randomly selected and checked by an independent scorer; any discrepancies in scoring were amended before data entry. A copy of all relevant information obtained from the questionnaires, rating scales and tests were placed in the child's hospital (CDC) file. Occasionally a third appointment was required to complete the assessment or to discuss the study further with the parent. Some parents were quite apprehensive about the use of medication as part of the research protocol or wanted more information on ADHD and diagnostic procedures. Some parents just wanted more time to talk about their children, families and concerns.

If the child did not meet inclusion criteria for the study (e.g., did not meet diagnostic criteria for ADHD, had a significant learning problem), general conclusions and recommendations were discussed with the parent at the end of the assessment session or often during an additional appointment. These key findings then were presented at the next Child Development Centre team meeting and the child either remained on the paediatrician wait list or was referred to another staff member (e.g., to myself in my position as one of the Clinical Psychologists at the Centre) or to another agency (e.g., Specialist Education Services). If the child did not require further specialist input, their file at the Centre was closed. The outcome of the team meeting was relayed to the parent by way of a phone call and officially in a letter to both the parent and the referrer.

If the child met inclusion criteria, he or she and the parent were assigned to a group according to the order outlined in the “treatment group assignment” section; this information was entered in the Child Development Centre file. A half-hour paediatric appointment was arranged so that it would occur within either two weeks before or one week after the start of the parent group. The child and parent were seen by one of the four paediatricians at the Child Development Centre, or their registrar. The paediatrician reviewed the information on file, interviewed the parent and examined the child. The study was discussed again with the parent to ensure that he or she understood the key aspects of the study. The paediatrician discussed the prescribing of active or placebo medication, as well as common stimulant drug side effects and the build up regimen for taking the medication. The paediatrician wrote out a one-month’s supply prescription for methylphenidate/placebo, 0.3mg/kg, to be taken twice a day, with the medication group assignment (1 research group or 2 research group) also written on the prescription. The prescription was filled at the Waikato Hospital Pharmacy, based on the child’s assignment regarding medication status. Repeat prescriptions were provided after a month for the next 2 months and coded in the same manner. The hospital pharmacy informed the paediatrician of a child’s medication status when he or she was seen for their paediatric follow up appointment, approximately 3 months later.

Occasionally when first seen by the paediatrician, children had other medical complaints (e.g., sinusitis, otitis media) that did not exclude them from participating in the study but which were dealt with by the paediatrician (e.g., prescribed medication, referred to audiology department). The paediatrician also completed and provided parents with entitlement forms for them to claim on financial allowances set by the

Health Funding Authority (previously known as Regional Health Authority) such as the Child Disability Allowance (previously known as Handicapped Child's Allowance) or through Disability Support Services (Income Support Services) such as travel benefits or respite care. The paediatrician wrote a letter to the referrer (copy to the parent) advising them of the outcome of their referral to the Centre.

Each parent attended either the training programme group or the support group. For both types of group, this consisted of attending weekly or twice-weekly sessions for a period of 2 months; each session lasted between 1.5 to 3 hours. The number of sessions varied from 9 to 16. The percentage of sessions attended by parents in the parent training groups ranged from 53.9% to 100% ($M = 89.4\%$, $SD = 19.7$) and the percentage of sessions attended by parents in the support groups ranged from 33.3% to 100% ($M = 68.1\%$, $SD = 28.8$). The difference between the means of the two groups was nonsignificant, $t(14) = 1.73$, $p > .05$. The sessions were conducted in a team meeting room at the Child Development Centre at a time and day suitable to the parents in the group (usually mid-morning or early afternoon). Due to office changes at the Centre, the team meeting room was moved from what was a relatively comfortable, pleasant and private room to one that was somewhat stark and cold. Every attempt was made to make the room feel more appealing. Tea and coffee-making facilities and favourite biscuits were supplied and freely available for parents and children. Child minding was provided informally from front-line staff at the Centre and when possible University of Waikato psychology graduates supervised children as well. The children, and sometimes their siblings and/or friends, were able to play in the Centre's waiting room or the playroom if they were brought along by the parents. There was a wide range of toys to play with (e.g., push-along and ride-on

trucks, train tracks), as well as drawing activities and books. Occasionally parents brought along more children than could be supervised appropriately and some sessions were interrupted by children coming in to the meeting room or parents having to leave the meeting to attend to their child.

A name was given to the parent programme to convey positive notions about parenting practices and children and to help parents identify with the programme. The parent programme was titled “PACT - Parent And Children Together: Positive Parenting for Active Happy Children”. In the first session for both the training group and the support group, parents were provided with individual folders containing a variety of information: (a) booklet from ACC on Clinical Trials - Your guide to ACC cover, (b) pamphlet from the Health Consumer Service at Midland Health outlining their service on complaints or concerns about the quality of service providers, (c) copy of a New Zealand published magazine (Parents Centres NZ) called KiwiParent, and (d) several pamphlets on services provided by local support agencies including Parentline, Barnados, Parents Centres, ADHD Association and The Salvation Army. Parents also were provided with a programme outline, and information on child development and ADHD (Appendix I). The programmes are detailed below.

Parent Training Programme

The parent training programme used in my study was based on four programmes: Anastopoulos and Barkley’s programme (1990) specifically tailored to meet the special needs of children with ADHD and their families; Barkley’s (1987) parent training programme for the management of children with problem behaviour; Eyberg and Boggs’ (1989) parent training programme for pre-schoolers with oppositional-defiant behaviour; and, the work by Campbell (1990) on developmental

and clinical issues regarding behaviour problems in pre-schoolers. The programme also utilised information handouts and record charts from Braswell and Bloomquist (1991). The historical and theoretical backgrounds of these approaches have been covered in the Introduction. The handouts provided to parents throughout the sessions are presented in Appendix J.

Step 1: Programme orientation and review of ADHD.

Aims: (a) to acquaint parents with the mechanics (i.e., rationale and purpose) of conducting the programme, (b) to increase their knowledge of 'normal' development, as well as issues pertaining to ADHD, and (c) to begin addressing any 'faulty perceptions' that they may have about themselves or the child.

Topics covered:

1. Brief update on status of child and family since initial assessment.
2. Rationale and purpose of programme and brief description of sequence of training steps explained to parents (handout provided).
3. Information provided on normal child development, stages and skills achieved at various ages.
4. Discussion of specific issues and/or queries pertaining to ADHD including history, primary problems, clinical criteria used to formulate diagnosis, prevalence rates, additional problems (e.g., aggression, academic underachievement, social skills problems, etc.), adolescent and adult outcomes, consideration of causes of disorder, description of various assessment devices, and review of treatment approaches.
5. Time for questions, chance for parents to express their reactions and brief discussion on expectations of programme and intervention outcomes.

6. Handouts on availability of appropriate texts on child development and behaviour management, as well as general information on ADHD and local community/support agencies.

Step 2: Parent-child relations and principles of behaviour management.

Aim: to understand parent-child relationships and principles of behaviour.

Topics covered:

1. Review of carry-over concerns or issues from previous session.
2. Discussion of conceptual framework (i.e., four-factor model) for understanding development of parent-child interactions and their therapeutic management. The four major factors that in various combinations can contribute to the emergence and/or maintenance of children's behavioural difficulties are:
 - (a) child characteristics such as physical characteristics and developmental abilities, inborn temperamental style which encompasses general activity level, attention span, sociability, responsiveness to stimulation, habit regularity, etc.; any early signs of temperamental difficulties of the child are identified and discussion on how these difficulties can bring the child into conflict with his or her environment.
 - (b) parent characteristics such as those similar to those listed for the child; attention is given to how parent and child characteristics mesh, i.e., goodness of fit between various child and parent characteristics; the use of the child and parent profiles to make parents more aware of the fit between their own and their child's characteristics and to note where conflicts between them may arise, placing children at risk for behavioural difficulties; discussion of role/job of parent.
 - (c) stresses impinging on the family and how changing these can alter interactions; potential stress events may relate to personal problems, marital relationship, financial

problems, occupational problems, problems with relatives and/or friends, and problems created by siblings; stress may affect the parents' emotional well-being which in turn will affect their ability to effectively and consistently deal with inappropriate or difficult child behaviour; it may alter parents' perceptions of the child and may also affect the child's emotional well-being.

(d) situational consequences such as the way parents respond to the child's behaviour when it occurs and the way in which this is much more under the control of parents and other adults; more detail is provided on situational consequences (e.g., escalation model) and how they affect the emergence, maintenance and/or exacerbation of the child's behavioural difficulties; it is important to recognise the parents' own risk factors and to change or minimise them where possible, the child's risk factors and to change them or at least learn to accept and cope with them better, and situational consequences that may be creating, maintaining or exacerbating the child's difficulties.

3. Overview of general behaviour management principles:

(a) how antecedent events, as well as consequences, can be altered to modify the child's behaviours.

(b) acceptance of the child's behaviour by parents.

(c) discussion on different types of reward and penalty strategies, using them in combination and the need to administer them in a specific, immediate and consistent fashion, e.g., some children can become bored easily and quickly so the parent must use salient and meaningful consequences as well as changing the consequences periodically to keep them interesting and motivating.

4. Discussion and information on functional analysis which provides more specific information on the above principles and strategies.

5. Activities for home (for parents) include (a) writing up a profile of the child's characteristics, (b) profile of parents' characteristics, (c) inventory of family stresses. The parents also are asked to less formally begin observing their parenting efforts in the context of the above behaviour principles. Parents are provided with inventories to fill in for the next session, as well as information on behaviour management principles.

Step 3: Enhancing parental attending skills.

Aim: to learn positive attending and ignoring skills in the context of special play time exercise.

Topics covered:

1. Review of home activities and issues arising from previous session.
2. Discussion of the importance of attending positively to children and adults, e.g., some children generally engage in few behaviours that elicit any type of positive parental response therefore parents tend to interact less with them and when they do interact they tend to be corrective, directive, coercive and unpleasant. Therefore, some children are less likely to behave in compliant and motivated ways.
3. The use of special playtime is introduced:
 - (a) 15 to 20 minutes per day (or as much as is possible) is set aside for interacting with the child in the absence of major time or other pressures or interference.
 - (b) the child decides what to do (within broad limits) and is encouraged to choose activities using building, fantasy and/or activity toys versus highly structured games.
 - (c) the parent is encouraged to remain as "nondirective" and "noncorrective" as possible and to narrate ongoing play activities in positive terms. The parent establishes as few rules as possible with the child prior to the beginning of the play

session. If problems arise during the play session, the parent states the rule, states it again if necessary and then ends the session with a positive statement such as “But we can come back again tomorrow.”

4. Handouts are provided on special time procedures and suggestions for giving positive feedback and approval to the child, as well as information on child-directed interaction. The handout on positive parenting through special playtime is to be filled in and brought back to the next session.

Step 4: Paying positive attention to appropriate independent play and compliance and giving commands more effectively.

Aims: (a) to extend positive attending skills to appropriate independent play, (b) to extend positive attending skills to child compliance with simple requests, and (c) to teach more effective methods of communicating commands.

Topics covered:

1. Review of special time and home activities.
2. Adaptive attributions and beliefs about ADHD and adaptive behavioural interchanges are discussed; handouts are completed in session.
3. Discussion of expanding positive attending to other situations, e.g., many children become disruptive when parents are engaged in home activities such as talking on the telephone, dinnertime, visiting company, etc. Parents generally do not hesitate to interrupt ongoing activity to address disruptions; the question is posed, “Should parents stop what they are doing to positively attend to children when they are engaged in independent play that is not disruptive?” Most people have the attitude of ‘let sleeping dogs lie’, however this may be an inaccurate perception (perhaps jumping to conclusions and not 100% sure). When appropriate play is ignored it may lead to a

decreased probability of it occurring, thereby increasing the likelihood that various disruptive behaviours will develop inadvertently. Parents are instructed:

- (a) Pay more positive attention to their child whenever they catch him or her being compliant.
- (b) Practice the use of positive attending skills by issuing brief sequences of simple household commands that have a high probability of eliciting compliance
- (c) Praise the child when she or he is playing independently and not bothering the parent while he or she is performing tasks such as talking on the telephone or preparing meals.

4. All commands are not equal, e.g., “Set the table” may have a low probability of eliciting child compliance whereas “Please turn on the t.v.” is likely to have a much higher probability. The manner in which commands are given is discussed and recommendations include:

- (a) Issue instructions that the parent intends to follow through on
- (b) Commands should be relatively simple and clear and take the form of direct statements (e.g., “Put the blocks on the table”, “Hand me the crayon”), rather than indirect commands (e.g., “Be good”), non-specific statements (e.g., “Let’s do this together”), questions (e.g., “Would you like to sit down?”) or rationale-type commands (e.g., “You need to get dressed now because we have a doctor’s appointment at 1.00pm and if you don’t get dressed now, we will be late.”).
- (c) Commands should be stated positively (i.e., what to do versus what not to do), e.g., “Draw on the paper” versus “Stop drawing on the table”. They should be issued without ‘negative’ affect (e.g., with anger).
- (d) Instructions and commands should be developmentally appropriate.

(e) Commands should require only one behaviour for the child to perform; parents are taught not to string commands together, such as “Sit down and find the red car and put it in the garage.”, and not to give global commands that encompass many specific behaviours, such as “Clean up the table.”

(f) Commands should be given in the absence of outside distractions and while making eye contact with the child to increase the likelihood of the child attending to such instructions.

(g) Have the child repeat the instruction.

5. Handouts are provided on the above details as well as recording charts for practising positive attention and reinforcement charts.

Step 5: Establishing home token system.

Aims: (a) to provide children with external motivation that they need to complete parent-requested activities that may be of little intrinsic interest to them, and (b) to frame parental control as a constructive responsibility in the child’s best interest.

Topics covered:

1. Parents are asked to generate two lists: (a) daily, weekly and long-range privileges that are likely to be interesting and motivating to the child, and (b) daily and weekly chores and/or household rules. Later at home, the parent can get input from the child about other items that can be included in the list. As nearly all children included in this programme are unable to read, the lists need to be written up in basic language with accompanying pictures of the task and reward.

2. Point values are assigned to items in the list. The child collects items such as tokens, buttons, stickers or stamps (depending on what is feasible for the parent and child), and ‘stores’ them in a home ‘bank’. The child earns tokens for complying with

initial parent requests and completing tasks. Tokens are exchanged for backup rewards as indicated in the list of privileges. Tokens also can be given for completing tasks or performing activities not specifically listed and bonus tokens can be given (at the parent's discretion) for the attitude shown by the child during the performance of tasks and behaviours. Long term use of this procedure is explained to the parents, e.g., reviewing the list of tasks and rewards every few weeks.

Several alternatives are discussed, e.g., the parent can record smiley faces on a chart instead of the child collecting tokens, the child can receive stamps up his or her arm and if necessary the total number of stamps can be exchanged for a backup reward.

3. At home, the parent needs to clearly explain the programme to the child.
4. Videotape titled "ADHD-What do we know?" (Barkley, 1992) is presented in session. This is a 37-minute video that provides an overview of ADHD and information on primary characteristics, prevalence, developmental features and course, situational factors, causes of and problems associated with ADHD and adult outcomes.
5. Handouts are provided to parents on token economy strategy/recording chart as well as additional ideas for rewards.

Step 6: Review of home token system and response cost.

Aim: refinement of token system (with the addition of response cost strategies for minor problem areas, if appropriate to group).

Topics covered:

1. General review.

2. Response cost system explained to parents: (a) deduct tokens for non-compliance of one or two particularly troublesome requests or violations of household rules, (b) the tokens are equivalent to the amount the child would have earned for compliance of that task [this provides the child with the added incentive of not losing what they have already earned], (c) avoid punishment spiral, (d) don't deduct tokens more than two times in a row for the same non-compliant act, (e) ensure token reserves don't approach zero; if this happens, use bonus tokens for compliance.

3. Prior to starting the parent groups it was considered that this aspect of the programme might not be appropriate for the young age group or be difficult for some parents to carry out, especially if they have had difficulty carrying out previous aspects of the programme or there are too many stresses (including limited family time) or other children in the home. This appeared to be the case for all groups and therefore this step was omitted in the programme.

Step 7: Using time-out from reinforcement.

Topics covered:

1. One or two problem areas (or especially resistant types of non-compliance) are identified to become targets for time-out, if necessary. Parents are provided with Home Situations Questionnaire-Revised (Barkley, 1987) to help identify these situations or problems.

2. Time-out is explained and modelled for the parents. After the parent's request is made and the child fails to comply within approximately five seconds, the parent adopts a firm facial expression and body posture and issues a firmly stated warning, "If you don't do as I asked, then you are going to sit in that chair". If after five more seconds the child does not comply, the parent announces firmly, "You didn't do as I

asked, so now you must sit in the chair”, i.e., the parent labels the rule-violation which in this example is ‘not doing what was asked’. All child attempts to avoid the chair are ignored. The child is escorted to the chair and the parent says, “You are to stay in that chair and remain quiet until I tell you when you can come out”. The amount of time (minutes) is roughly equivalent to the child’s age (e.g., 4 years of age = 4 minutes). After this time and when the child is quiet, the parent approaches the chair and reissues the command or request. If the child is non-compliant, the parent reissues the command or request and uses the above procedure until compliance is achieved. When compliance is achieved the parent thanks the child in a neutral tone; no other rewards are given). A few moments later, the parent tries to find an opportunity to praise and reward the child for some other compliant behaviour.

If the child leaves the chair the parent may need to use some other backup strategy, e.g., response cost, privilege removal, grounding, time-out in another place. Backup contingencies are used only for getting off the chair and not for the original non-compliance; in this way, the chair becomes a highly effective negative consequence. Leaving the chair is generally defined as when the child lifts his or her bottom off the chair, rocks the chair so that it moves about the floor or tips the chair over. The child is allowed to swivel in the seat, turn about, look around, fidget, etc.

3. Handout on time-out procedures is provided.

Step 8: Extending time-out to other behaviours and managing the child’s behaviour in public places.

Aims: (a) to review previous strategies, (b) to identify other areas of non-compliance, and (c) to extend time-out to them.

Topics covered:

1. Discussion on problem areas outside the home (e.g., visiting the supermarket) and previously employed strategies.
2. Such problems in public are anticipated and the parent establishes a clear plan for dealing with them prior to going there:
 - (a) Parents review with the child their expectations for behaviour in this setting.
 - (b) Parents establish some incentive for compliance with these rules.
 - (c) Parents specify what types of outcomes or consequences will be applied should non-compliance occur. These might include modified versions of strategies used successfully at home such as dispensing tokens for ongoing parental requests (e.g., “Stay close”, “Don’t touch”), removal of tokens for non-compliance, or modified versions of time-out such as using quiet, out of the way public areas or returning to the car. If this is not possible, parents can note down instances of problem behaviours and use time-out strategies when the parent and child have returned home.
3. Brief discussion on parental perceptions about what other people will think in these situations.
4. Handout provided on above strategies.

Step 9: Handling future behaviour problems.

Topics covered:

1. Review all previously covered aspects of training programme.
2. Parent feedback (verbal).
3. Explore what may be problematic in the future and contemplate how this will be handled.
4. Follow up issues, e.g., relating to other settings such as kindergarten.

Step 10: Individual booster session (within 1 month later).

Topics covered:

1. Re-administer rating scales and questionnaires.
2. Further review and refinement of intervention strategies.
3. Parent feedback (written).

In this session, the parent completed several rating scales including the parent versions of the ADHD Rating Scale and Rating Scale IV (A), Conners' Rating Scale, Family Environment Scale (Real form), Parental Acceptance-Rejection Questionnaire and the evaluation form. The parent also was given forms (teacher versions of ADHD Rating Scale and Rating Scale IV (A) and Conners' Rating Scale) for the teacher to complete and post back. The child was retested on the Conners' Kiddy-Continuous Performance Test, followed by videotaping of the behavioural observation tasks with the parent and child. These were conducted in the morning or after lunch when the child is on medication/placebo.

Parent Support Group

The main aim of the support group was to act as a "placebo" relating to parent training and was designed to replicate the features of the parent group *without* incorporating any of the training aspects and activities covered in the parent training group. It was explained to the group that the aim was for parents of young children with ADHD to meet and offer one another support. Parents were provided with information on ADHD and normal child development in the first session and watched the video on ADHD in the fifth session. Parents met for at least nine sessions at the Centre and were free to talk and discuss any topic of their choice among themselves. While I sat in on these sessions, no specific feedback or advice on child management was given to parents. My role was to facilitate or direct conversation and discussion

among the parents. The last session (within 1 month of the last group session) was identical to Step 10 of the training group, i.e., readministration of rating scales, questionnaires, Conners' Kiddy-Continuous Performance Test and videotaping of behavioural observations. Once the follow up data had been collected, several additional sessions were organised with the parents to go over behaviour management strategies, as covered in the training group. One group came in during the evening so that their partners could attend the sessions.

Final Design/Treatment Integrity

While every attempt was made to conduct the study as outlined in the "general procedure" section and illustrated in Figure 1, there were some variations in protocol. As discussed previously, low participant numbers led to a change in the sequence of group assignment. In total I ran six groups, the final sequence being A1, A2, B1, B2, A2, B2. There were 26 people in the groups, however data from 10 of them were ineligible for analysis.

Checks on inclusion criteria were tightened after several children were admitted into the study who subsequently did not meet eligibility criteria for the study. These included two children who had been erroneously diagnosed as meeting criteria by the paediatricians and were referred by them for inclusion into the study, and another child who was admitted on the basis of parental report. These children had general behavioural problems, however teacher reports and rating scale results did not support diagnostic criteria for ADHD. Although these children and their parents participated in the medication trial and the parent groups, their data were not analysed in the final participant sample. One of these children had been in the first group, A1, leaving a total of four in that group. Two children had been in the second group, A2,

leaving a total of three in that group, however data from the remaining three children also were inadmissible. One child became ill during the intervention and did not continue to participate. Although the child had met diagnostic criteria for ADHD, there had been concerns about his family environment and maternal care. After the child had been admitted to hospital with suspected seizures (not confirmed), medication was stopped. The family was referred for care and protection services and the mother received assistance for mental health concerns. Another child had been given active medication inadvertently after the paediatrician had not written the appropriate code on the prescription; the mother of this child had received the medication in its identifiable pack so was not “blind” to the treatment condition. The other child in this A2 group also received active medication after the first prescription had been filled at another hospital pharmacy that was not aware of the study, but then received placebo medication when the repeat prescription was filled at the participating hospital pharmacy.

In the next group, B1, one mother knew her child was receiving active medication after she had asked for this and knowingly received it from the paediatrician; she and her son continued to attend sessions. This left only four participants in that group whose data were eligible for analysis. There were three and four participants in the next two groups, B2 and A2, respectively. Two of the mothers in this B2 Group brought their children and a sibling along to the sessions and all mothers in this A2 Group brought their four children as well as two siblings and a friend to most of the sessions. There was limited supervision of children at times and this led to a number of interruptions to the sessions. Even when there was a student supervising the children, they often came into the room to check on what was

happening or sometimes did not want to separate from their parent. There were several notable incidents due to the lack of supervision and the nature of the child's problems. One child left the building and had gone some distance before being found by his older sibling. Many of the children spent time getting in and out of and going up and down the elevator or running around the corridors and leaping over the reception desk and file area. Another child pulled down curtains in the playroom and smashed a light switch. There also were instances of physical fighting between some children.

One more participant was required to have equal numbers in each of the four intervention groupings, however it clearly was not appropriate to run a group with only one person. Four parents therefore attended the final B2 group. All children in this group met diagnostic criteria for ADHD. Two children were on the medication trial however one was not formally included because the mother did not fill the prescription at the hospital pharmacy and instead gave her son active medication which she had stored at home from several years before.

In subsequent data analysis and descriptions, the above six groups were classified on the basis of what they received and referred to as follows: Group 1 = 0.3mg/kg methylphenidate and parent training; Group 2 = 0.3mg/kg methylphenidate and parent support; Group 3 = placebo medication and parent training; and, Group 4 = placebo medication and parent support.

RESULTS

Sample Demographic Information

Demographic information obtained during the participant selection process for all 41 children who completed the full initial assessment is presented in Tables 2 and 3 (Figure 2 gives full details of the selection and assessment process). Table 2 presents the children's ages and their IQ scores and their mothers' ages, and Table 3 gives details of family structure.

Of the 41 children, 16 completed the study, 10 met diagnostic criteria for ADHD and other inclusion criteria but did not participate fully, and 15 were regarded as having "situational" ADHD, i.e., they met criteria for ADHD in only one setting (14 rated by parents as meeting criteria and 1 rated by teacher). These details were not available for the remaining 52 referrals (see Figure 2). These referrals included those who I could not contact (15), those who declined to participate (18), and those who were excluded from the study because they had significant intellectual or language problems, or there had been an improvement in the problem since referral, or they did not have a specific diagnosable problem (19).

A one-way ANOVA showed a significant difference between the mean ages of the children in the three groups, $F(2,38) = 3.76$, $p < .05$. Post hoc comparisons indicate that on average the participating children were significantly older than those with situational-ADHD, $p < .05$. There were no significant differences on the other demographic variables and so the groups could be regarded as equivalent on these variables, except age. Ratings by parents and teachers about behaviours associated with ADHD, as well as oppositional defiant behaviours, were relatively similar for children who participated in the study and those with ADHD but who did not fully

participate. For the non-participating group described above, however, there was a large difference between parent and teacher ratings, not only on measures of ADHD, but also on those assessing oppositional and defiant behaviours. The behaviour of these children clearly was problematic for their parents, but not so for their teachers.

Table 2

Details of Children's Age and IQ and Age of Mothers

Variable	<i>M</i>	min	max	<i>SD</i>
Children's age (yrs)				
participants (n=16)	4.78	3.33	5.91	0.80
non-participants ^a (n=10)	4.45	3.25	5.60	0.93
non-participants ^b (n=15)	3.99	3.00	5.25	0.70
Mothers' age (yrs)				
participants (n=16)	29.94	23.00	43.00	6.40
non-participants ^a (n=10)	28.60	21.00	41.00	7.38
non-participants ^b (n=15)	28.40	20.00	40.00	5.85
Children's Full Scale IQ				
participants (n=16)	97.19	80.00	123.00	11.81
non-participants ^a (n=10)	92.56	79.00	118.00	12.62
non-participants ^b (n=15)	88.40	76.00	103.00	7.92
Verbal IQ				
participants (n=16)	92.88	82.00	110.00	8.85
non-participants ^a (n=7)	98.00	82.00	110.00	9.27
non-participants ^b (n=7)	89.00	77.00	113.00	12.97
Performance IQ				
participants (n=16)	102.75	74.00	134.00	16.85
non-participants ^a (n=7)	99.71	81.00	124.00	14.33
non-participants ^b (n=7)	90.57	84.00	105.00	8.06

Note. ^a refers to children who met criteria for ADHD but who did not participate.
^b refers to children who met criteria for "situational" ADHD.

Table 3
Demographic Data

Variable	Participants(n)	Non-participants ^a (n)	Non-participants ^b (n)
Marital status			
no partner	5	6	5
with partner	11	4	10
Ethnicity			
Maori	2	2	3
Pakeha	13	8	12
Asian	1	0	0
Socio-economic status			
low	8	7	9
middle	7	3	4
high	1	0	2
Siblings			
0	4	5	3
1	5	1	4
2	4	3	4
3+	3	1	4
Household size			
2	2	4	0
3	4	0	1
4	3	3	5
5+	7	3	9
Birth position			
first	11	6	10
second	0	3	1
third	3	1	2
fourth+	2	0	2

Note. ^a refers to children who met criteria for ADHD but who did not participate.
^b refers to children who met criteria for “situational” ADHD.

Participant Characteristics

Three girls and 13 boys and their mothers participated in the study. In general, there was little involvement from fathers; a few fathers attended some of the assessment and intervention sessions and completed questionnaires and rating forms. A one-way ANOVA on the verbal and performance IQ scores (Table 2) showed that on average the children's Verbal IQ ($M=92.88$) was significantly lower than their Performance IQ ($M=102.75$), $F(1, 15) = 6.53$, $p < .05$. According to Sattler (1992, p. 1025) however, this level of difference in scores is not significant ($p > .05$) based on criteria outlined in the test manual recommendations.

Four of the children met diagnostic criteria for ADHD, combined-type, 9 met criteria for predominantly hyperactive-impulsive type and 3 met criteria for predominantly inattentive type. In addition, 5 of the children met diagnostic criteria for Oppositional Defiant Disorder. Five children lived with only their mothers; three of these mothers were single, one was separated and one was divorced. Only one of these mothers had ongoing contact with her ex-partner. The remaining 11 children lived with their married parents, 10 parents were in their first marriages and 1 was in their second marriage (this person had no contact with her previous partner).

Comparison with kindergarten children on Conners' Kiddy Continuous Performance Test. As discussed in the Method and shown in Appendix H, the Conners' Kiddy Continuous Performance Test was administered to 47 children attending kindergartens in the Waikato area. There was a significant difference between the ages of the kindergarten children ($M=4.21$) and children participating in the present study ($M=4.78$), $t(61) = 3.36$, $p < .05$. A one-way between-groups MANCOVA was carried out on two dependent variables, percentage omission and percentage commission, with age as the covariate. Rao's R for the model was

significant, $F(2,59) = 8.25, p < .05$. Subsequent analyses (ANCOVA) demonstrated a significant difference between means on the percentage omissions, $F(1,60) = 10.28, p < .05$, but a nonsignificant difference between means on the percentage commissions, $F(1,60) = 0.80, p > .05$. For percentage omissions, the participants scored significantly higher, i.e., missed more targets, ($M=34.94, SD=22.20$) than the kindergarten children ($M=24.94, SD=18.72$) whereas for percentage commissions, the participants' scores ($M=46.25, SD=22.35$) were similar to those of the kindergarten children ($M=42.51, SD=22.98$).

Preliminary Data Analysis

Composition of intervention groups. As reported in the Method, children were randomly assigned to one of four intervention groups. A one-way ANOVA showed a significant difference between intervention group means for Full Scale IQ, $F(3,12) = 3.63, p < .05$, however all post hoc comparisons between pairs of means were not significant. In subsequent analyses reported below Full Scale IQ has been used as a covariate, however the variance attributed to it was not significant.

Missing data. Where there were missing data, they were estimated using the procedure of inserting mean values as recommended by Tabachnick and Fidell (1989). Missing pre-intervention data points were substituted with the total sample mean. This occurred for the second administration of Rating Scale IV (A)-Parent version for the four participants in Group 1, as well as for the second administration of the ADHD Rating Scale-Parent version for Participant 4d (i.e., Group 4, participant #4). Data from the behavioural observations also were substituted in this way for Participant 3b (i.e., Group 3, participant #2) after the videotape on which the observations had been recorded was wiped inadvertently. Missing data points during- or post-intervention were substituted with the mean value for the participant's

intervention group (i.e., Group 1, Group 2, etc.). This occurred for the teacher versions of the ADHD Rating Scale, Rating Scale IV (A) and CTRS:R-L for Participant 1a (i.e., Group 1, participant #1). Pre- and post-intervention data from the Parent Acceptance-Rejection and Family Environment Scale questionnaires also were not provided by Participant 4d and data for these measures were substituted as outlined above.

Interobserver reliability of behavioural observations. Interobserver agreement was calculated using procedures outlined by Cooper, Heron, and Heward (1987) on the two behavioural observation tasks. On the compliance task, percentage of agreement was calculated for each category by dividing the smaller total of observations for the total period by the larger number of observations for the total period and multiplying by 100. When both observers coded no observations in a category, agreement was calculated as 100% and when one observer coded no observations in a category, agreement was calculated as 0%. Observer 1 coded all recordings and I (Observer 2) subsequently coded 25% of the compliance task recordings and 25% of the attentional behaviour recordings. Percentages of agreements for each category on the compliance task are presented in Table 4.

In general, there were adequate levels of agreement in all categories. When there were low levels of agreement these generally occurred when there was a low occurrence of the particular behaviour, e.g., the agreement of 33% on parent approval for participant coding session #7 represented Observer 1 recording one observation and Observer 2 recording three observations; the agreement of 50% for participant coding session #3 represented Observer 1 recording one observation and Observer 2 recording two observations.

Table 4

Interobserver Agreement (%) for Each Category on Compliance Task

Participant coding session	Category					
	Commands	Repeat commands	Child compliance	Child negative	Parental approval	Parent negative
1	91	80	56	100*	100	100*
2	100	87	100	100	100	100*
3	92	100*	92	100*	50	100*
4	100	67	100	100	100*	100*
5	100	83	100	100	100	100*
6	75	100*	75	100*	100	100*
7	67	100*	80	100*	33	100*
8	92	88	100	67	100	0**

Note. * indicates no occurrence of behaviour recorded by both observers.

** indicates no occurrence of behaviour recorded by one observer.

On the attention task, percentage of agreement was calculated for each category by using both scored-interval and unscored-interval methods. Percentages of agreements for each method and for each category are presented in Table 5. In the scored-interval method, all intervals in which both observers record the non-occurrence of the behaviour were ignored in calculating the agreement score. Interobserver agreement was calculated by dividing the total number of agreements of occurrence by the sum of agreements plus disagreements and multiplying by 100. If both observers scored no occurrence of behaviour in a category, percentage of agreement in the scored-interval was recorded as 100%. In the unscored-interval method, all intervals in which both observers recorded occurrence of the behaviour

were ignored. An agreement was counted when both observers recorded the non-occurrence of the behaviour and a disagreement was counted when one observer recorded occurrence of a behaviour and the other observer recorded it as not having occurred in that interval. Interobserver agreement was calculated by dividing the total number of agreements of non-occurrence by the sum of agreements plus disagreements and multiplying by 100.

Table 5

Interobserver Agreement (%) on Scored-Intervals (S-I) and Unscored-Intervals (U-I) for Each Category on Attentional Behaviour Task

Participant coding session	Category									
	Off-task		Fidgeting		Vocalising		Playing with object		Out of seat	
	S-I	U-I	S-I	U-I	S-I	U-I	S-I	U-I	S-I	U-I
1	75	96	67	82	100*	100	38	36	95	91
2	100*	100	86	94	100*	100	100*	100	100*	100
3	100*	100	100*	100	100*	100	100*	100	100*	100
4	100*	100	100*	100	100*	100	100*	100	100*	100
5	100	100	33	86	67	96	90	95	72	82
6	0**	95	0**	95	100*	100	0**	95	0**	95
7	100*	100	54	74	100*	100	100*	100	100*	100
8	100*	100	72	65	100*	100	100	100	50	93

Note. * indicates no occurrence of behaviour recorded in that category.

**indicates one observer recorded occurrence of behaviour and the other observer recorded no occurrence.

In general, there were adequate levels of agreement in most categories, although there was more variation in reliability measures for the fidgeting category. When there were low levels of agreement on the scored-intervals these mainly occurred when there was low level of occurrence of behaviour, e.g., the four 0% ratings on the scored-intervals occurred when Observer 1 recorded one occurrence and Observer 2 recorded no occurrence.

Data analysis of baseline rating scales. Results from one-way MANOVAs indicated that there were no significant differences between the first and second baseline administrations of the Parent Versions of the ADHD Rating Scale, $F(6,10) = 0.88, p > .05$, and Rating Scale IV (A), $F(2,14) = 0.32, p > .05$. Data from the second administration were used in all analyses. Means are presented below in Table 6.

Table 6

Means for Baseline Administrations of ADHD Rating Scale and Rating Scale IV (A)

Factor	First administration		Second administration	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
ADHD Rating Scale				
total score	35.69	8.65	36.80	7.49
total problems	12.56	3.37	13.47	3.24
inattention total	16.41	5.87	15.93	5.50
inattention problems	5.56	2.50	5.80	2.32
hyperactivity total	19.41	4.74	20.87	3.67
hyperactivity problems	7.06	2.05	7.53	1.71
Rating Scale IV (A)				
total score	16.19	5.83	16.68	5.35
total problems	5.56	2.45	5.82	2.33

Test-retest reliability coefficients for the six variables measured by the parent version of the ADHD Rating Scale range from .42 to .87. All correlations were significant except for the number of hyperactivity-impulsivity problems ($r=.42$). Test-retest reliability coefficients for the two measures on the parent version of the Rating Scale IV (A) are .85 to .86.

Clinical observations. Although statistical procedures were carried out to address the first two research questions on the effectiveness of intervention, it should be noted that irrespective of the group parents were allocated to, many of them expressed a strong desire for their child to have the active medication rather than the placebo medication. Two parents were adamant that they wanted the active medication, even though their child was supposed to have received placebo medication, and subsequently this was prescribed by the paediatrician. Their data therefore were excluded from the final analysis. During the intervention phase, all parents tried to guess what their child was receiving (active versus placebo) and when their child's behaviour was relatively settled, they tended to attribute the positive results to the child having active medication, regardless of what their child was actually receiving. Conversely, when the child's behaviour was poor or worsened, most parents tended to attribute this change to their child taking the placebo medication. On the other hand, the parents did not express any consideration of what type of parent programme they were receiving (training versus support). One parent felt that her child was receiving placebo medication and this was having no positive effect for him. She reported that "...there is no point in trying the strategies recommended in the programme until he is receiving the active medication...the things I'm learning (i.e., strategies) just won't work until he has slowed down and can concentrate better..."

Effect size. Effect size refers to the magnitude of the effect under the alternate hypothesis. This was calculated first by obtaining eta-squared (η^2) by taking the relevant sum of squares and dividing by the total sum of squares, i.e., the magnitude for variable A is SS_A/SS_{total} and for variable B is SS_B/SS_{total} while the magnitude for the interaction is SS_{AB}/SS_{total} (Howell, 1987, p.386). This was followed by calculating Cohen's f (partial η^2) using the equation $f = [\eta^2/(1-\eta^2)]^{1/2}$ (Cohen, 1988). η^2 is a descriptive statistic in that it only describes the effect size of the sample data whereas Cohen's f provides an estimate of the proportion of variance accounted for in the population. Using Cohen's conventions, a small effect size = .10, medium = .25 and large = .40 for main effects and interactions. Effect size is reported for all significant findings in ANCOVA and MANCOVA analyses.

ANCOVA Results

To address the first research question (Is the combination of parent training and stimulant medication better than either treatment alone?), separate repeated-measures ANCOVA were performed on the 35 dependent variables. Intervention Group was the between-groups factor (4 levels) and Intervention Phase was the repeated measures factor (either 2 levels [pre/post] or 3 levels [pre/during/post]). As indicated earlier, Full Scale IQ was used as the covariate. The small number of participants in each intervention group violated the assumptions of MANOVA and therefore multiple ANCOVAs had to be performed (Tabachnick & Fidell, 1989). The Newman-Keuls test was used for all post hoc comparisons as recommended by Howell (1987) as the best choice of tests when comparing fewer than eight groups. Caution is required in interpreting some of the results because of significant non-homogeneity of variance as indicated in the Levene's Tests of Homogeneity of

Variance. All analyses are presented in Appendix L. Figures are presented below to illustrate all interactions (i.e., Intervention Group x Intervention Phase) for each dependent variable. Even though many of the ANCOVAs were not significant, the figures help to illustrate a general trend for participants receiving the combined active treatment components (i.e., Group 1) to improve relative to the other groups. In addition, the results from each dependent variable for each participant are graphically illustrated and discussed where relevant. Effect size is reported for significant effects.

1. ADHD Rating Scale-Parent version

Figures 4 and 5 illustrate the means for each group pre-, during- and post-intervention for each measure on the ADHD Rating Scale-Parent Version. While there is a general trend for the ratings in Group 1 (active medication/parent training) and Group 2 (active medication/support group) to decrease from pre- to during-intervention, this trend does not continue through to post-intervention for Group 2. Rating scores for Group 1 continue to decrease, although modestly in this phase. In general, there is little change for Group 3 (placebo medication/parent training) and Group 4 (placebo medication/support group). As illustrated in Figures 6 to 11, there is more variability in the ratings for individual participants in Groups 1 and 2 than for those in Groups 3 and 4.

Appendix Tables L1 to L20 show that there is a significant main effect only for Intervention Phase on the dependent variable “hyperactivity-impulsivity score”, $F(2,24) = 3.90, p < .05 (f = .33)$. Post hoc comparisons show that the level of hyperactivity-impulsivity for all groups was significantly lower during-intervention and at post-intervention compared to pre-intervention. However there is significant non-homogeneity of variance as indicated on the Levene’s Test of Homogeneity.

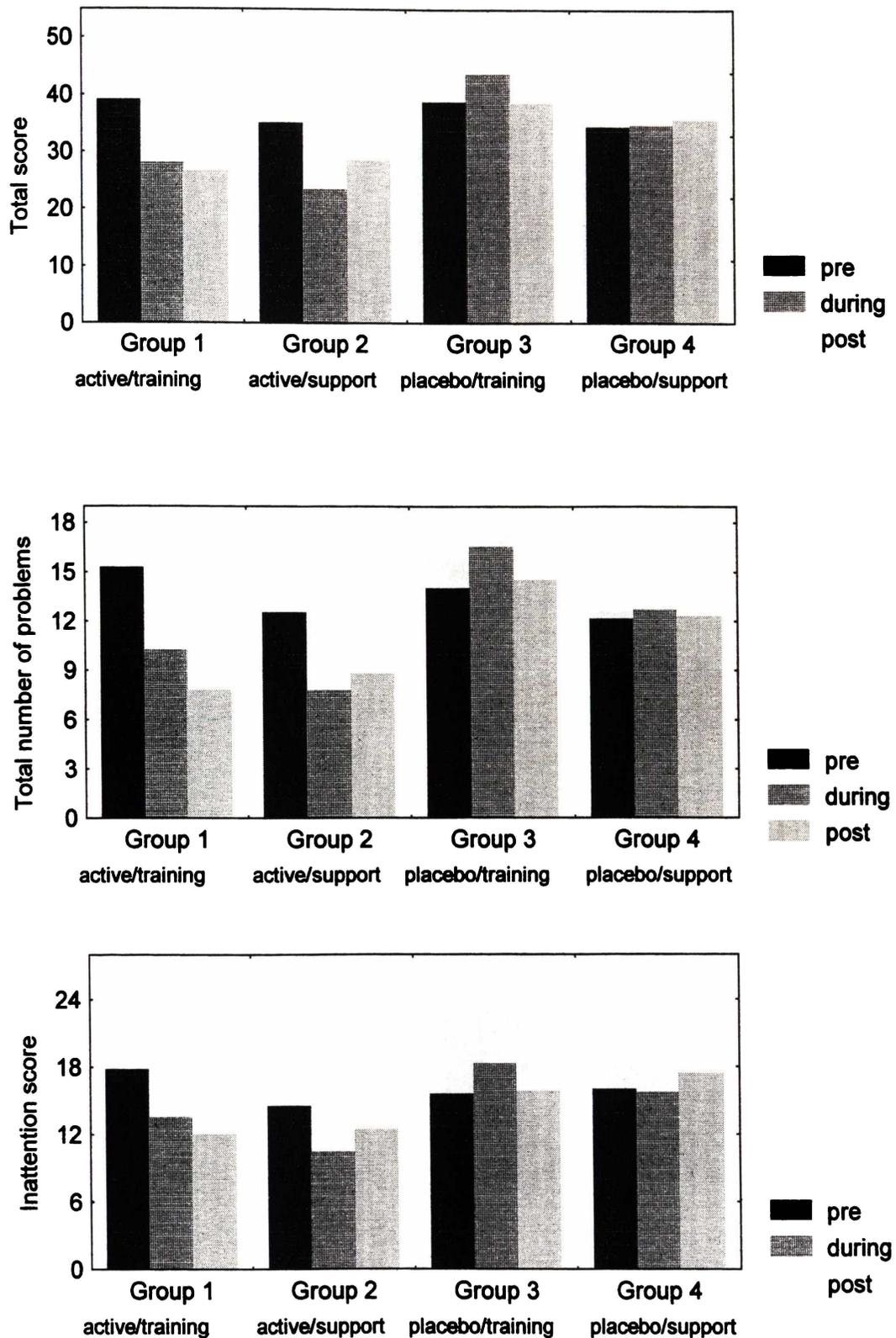


Figure 4. Means for each group pre, during and post intervention for first three measures on ADHD Rating Scale-Parent Version.

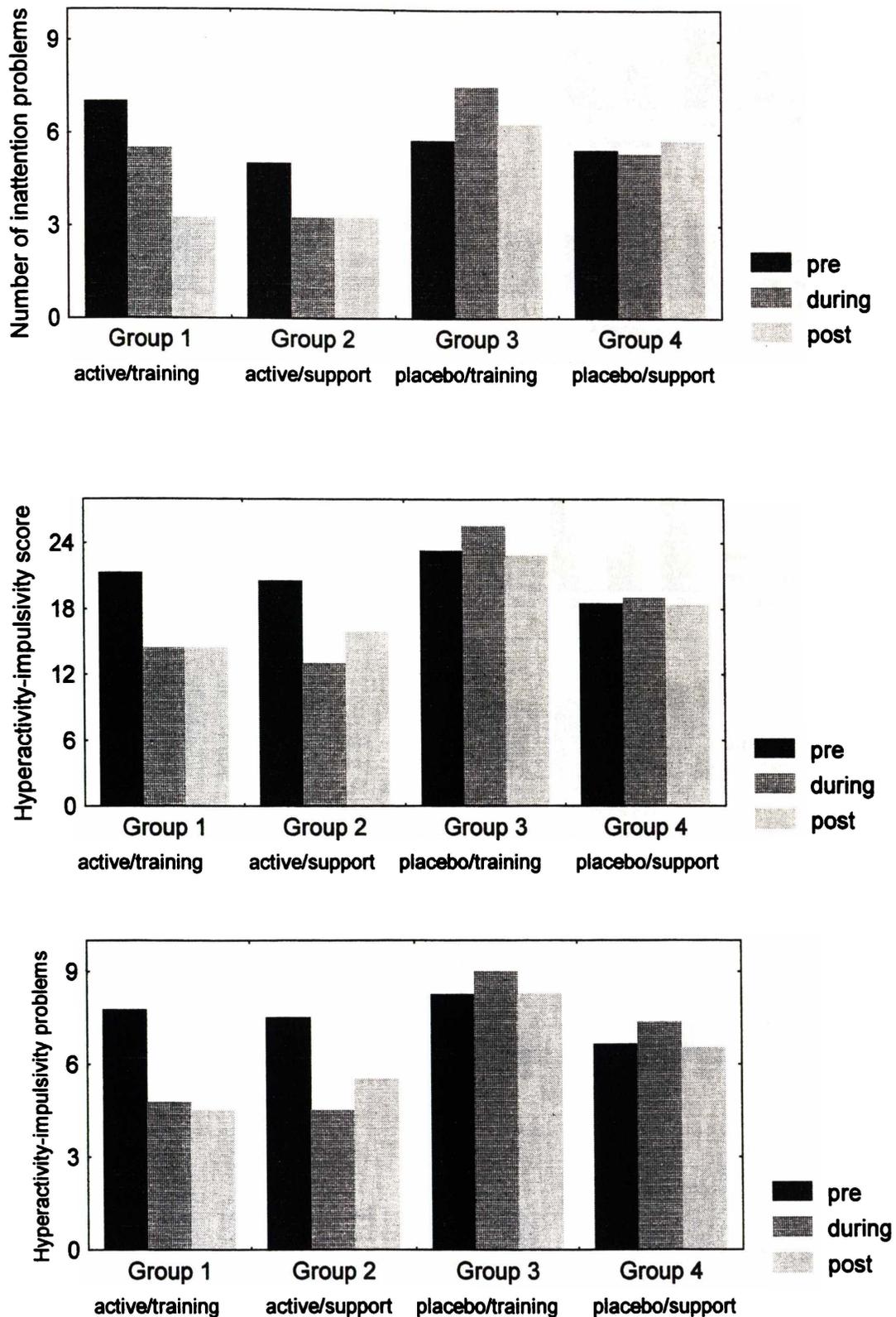


Figure 5. Means for each group pre, during and post intervention for remaining three measures on ADHD Rating Scale-Parent Version.

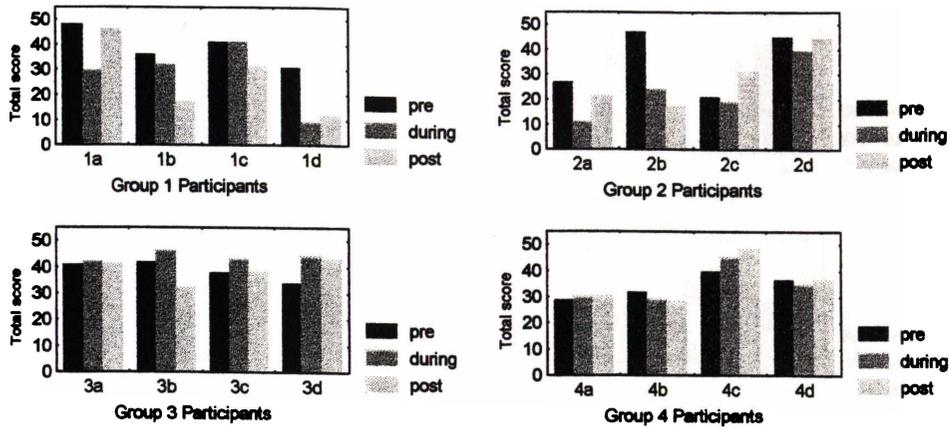


Figure 6. Total score for each participant on ADHD Rating Scale-Parent Version.

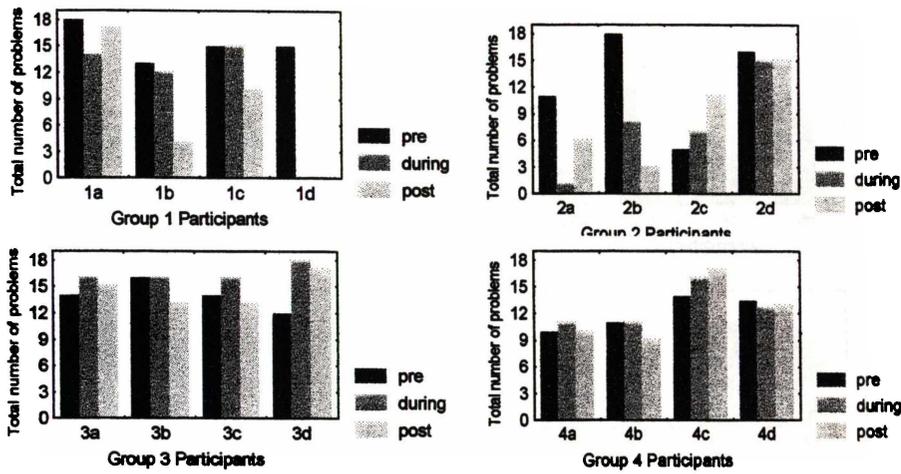


Figure 7. Total number of problems for each participant on ADHD Rating Scale-Parent Version.

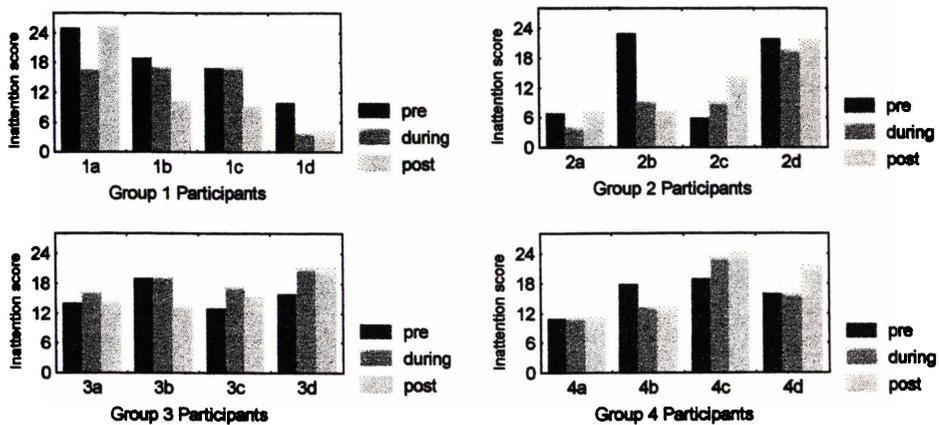


Figure 8. Inattention score for each participant on ADHD Rating Scale-Parent Version.

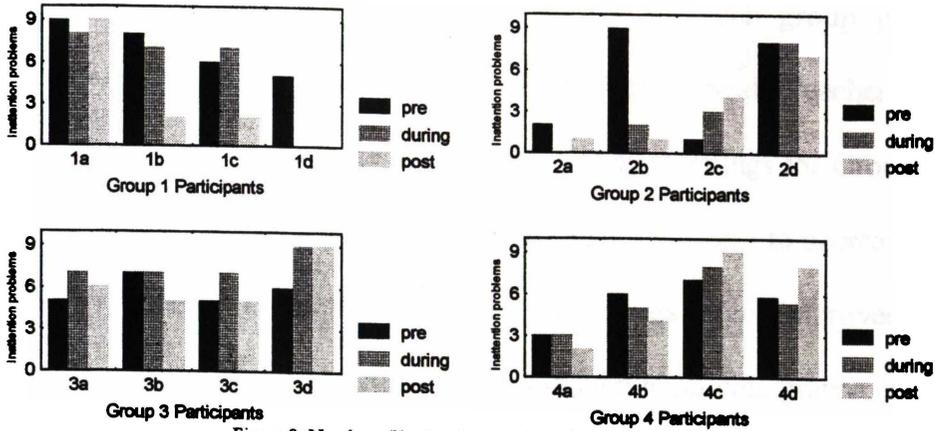


Figure 9. Number of inattention problems for each participant on ADHD Rating Scale-Parent Version.

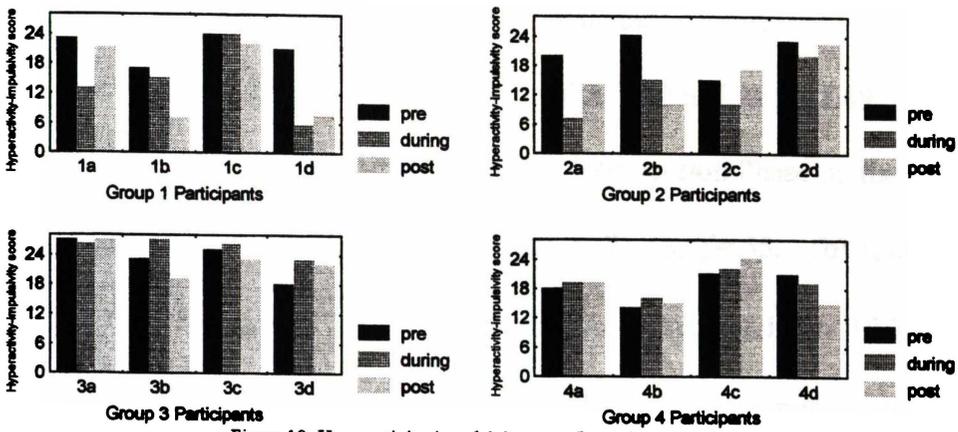


Figure 10. Hyperactivity-impulsivity score for each participant on ADHD Rating Scale-Parent Version.

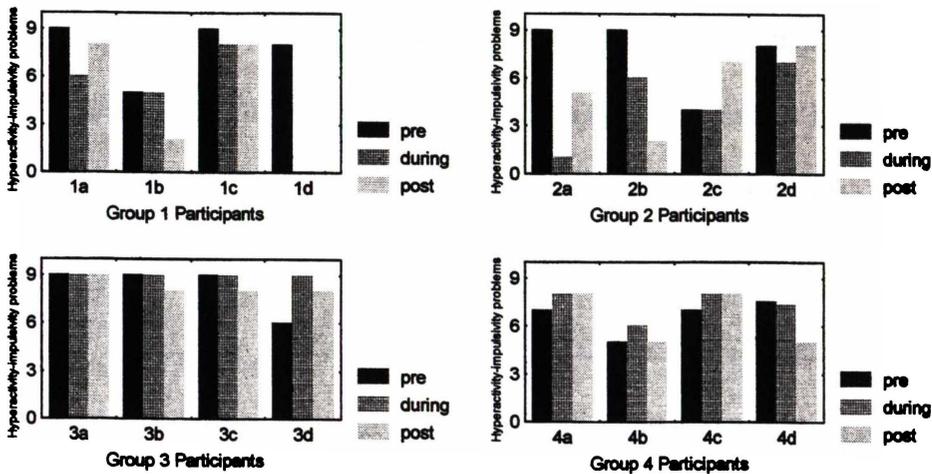


Figure 11. Number of hyperactivity-impulsivity problems for each participant on ADHD Rating Scale-Parent Version.

2. ADHD Rating Scale-Teacher version

Figures 12 and 13 illustrate the means for each group pre- and post-intervention for each measure on the ADHD Rating Scale-Teacher version. On nearly all of the measures there is a modest decline in ratings for Groups 2, 3 and 4, however there is a very clear trend for the ratings for Group 1 to decrease from pre- to post-intervention on all measures; a decrease in ratings means improved behaviour or fewer problems. This also is illustrated in the individual data graphs (see Figures 14 to 19). The ratings on all measures decrease for all participants in Group 1 whereas there is variability in the ratings for participants in the three other groups, with ratings increasing or decreasing depending on participant and measure.

The analyses are presented in Appendix Tables L21 to L49. These tables show that there are significant main effects for Intervention Phase on the six measures in this scale, $p < .05$: (a) total score, $F(1,12) = 21.68$, $f = .55$, (b) total number of problems, $F(1,12) = 16.23$, $f = .53$, (c) inattention score, $F(1,12) = 19.32$, $f = .35$, (d) number of inattention problems, $F(1,12) = 11.21$, $f = .35$, (e) hyperactivity-impulsivity score, $F(1,12) = 15.15$, $f = .44$, and (f) number of hyperactivity-impulsivity problems, $F(1,12) = 15.71$, $f = .44$. Furthermore, the tables show significant interactions between Group and Intervention Phase on five of the measures in this scale, $p < .05$: (a) total score, $F(3,12) = 6.76$, $f = .52$, (b) total number of problems, $F(3,12) = 4.51$, $f = .47$, (c) inattention score, $F(3,12) = 10.90$, $f = .48$, (d) number of inattention problems, $F(3,12) = 4.64$, $f = .40$, and (e) number of hyperactivity-impulsivity problems, $F(3,12) = 3.77$, $f = .35$ (however this model failed the Levene's Test of Homogeneity at pre-intervention $F(3,12) = 5.38$, $p < .05$).

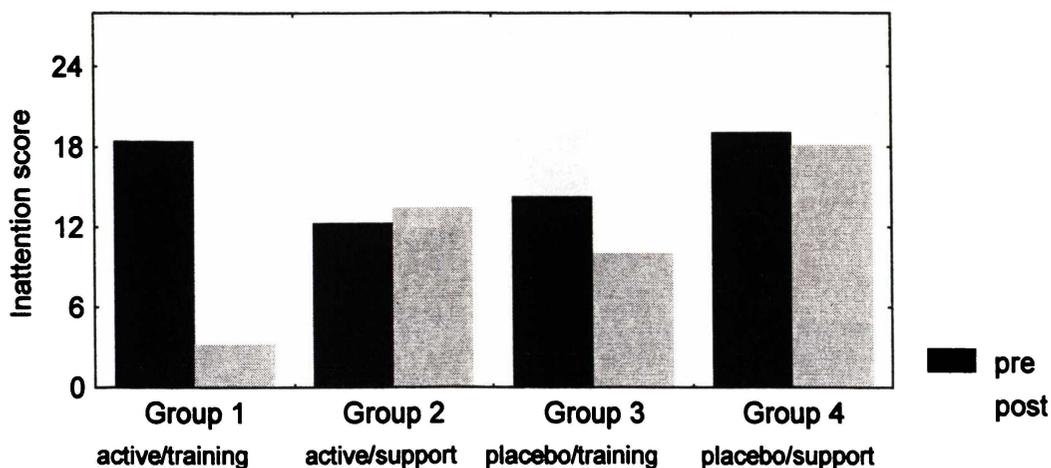
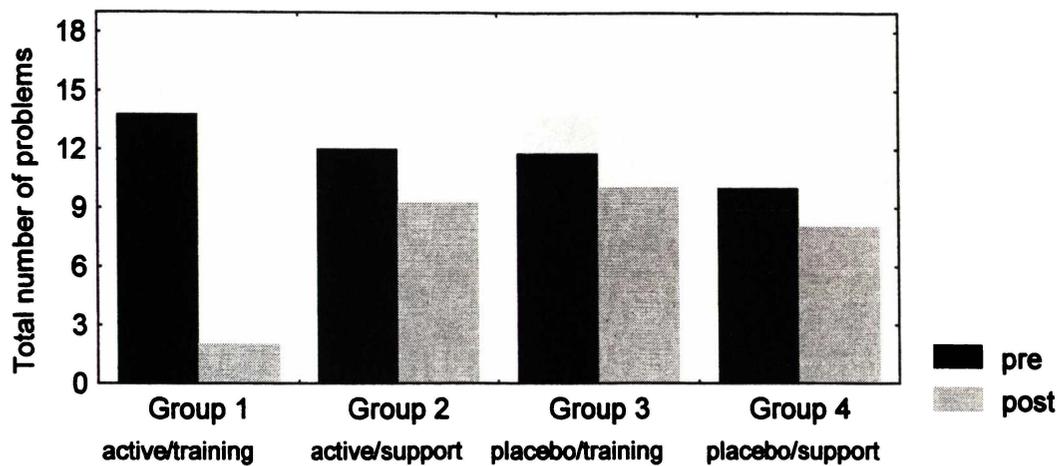
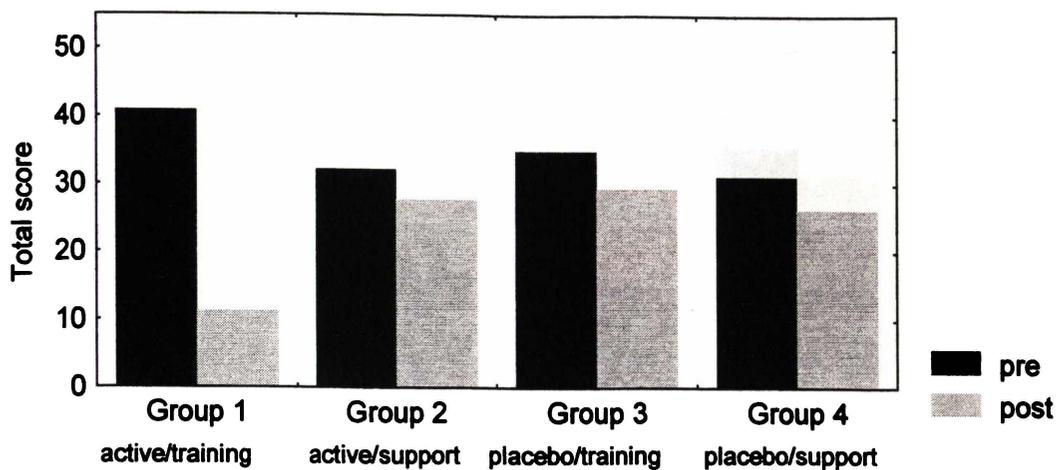


Figure 12. Means for each group pre and post intervention for first three measures on ADHD Rating Scale-Teacher Version.

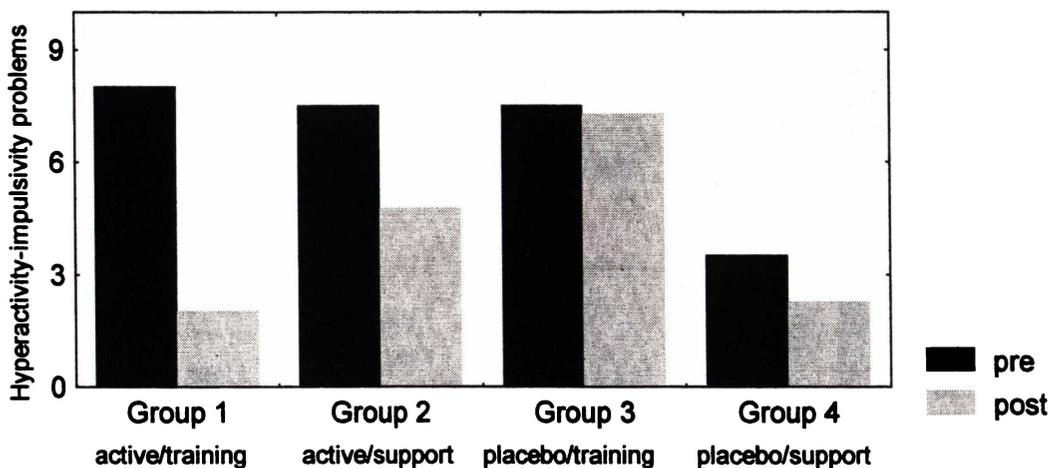
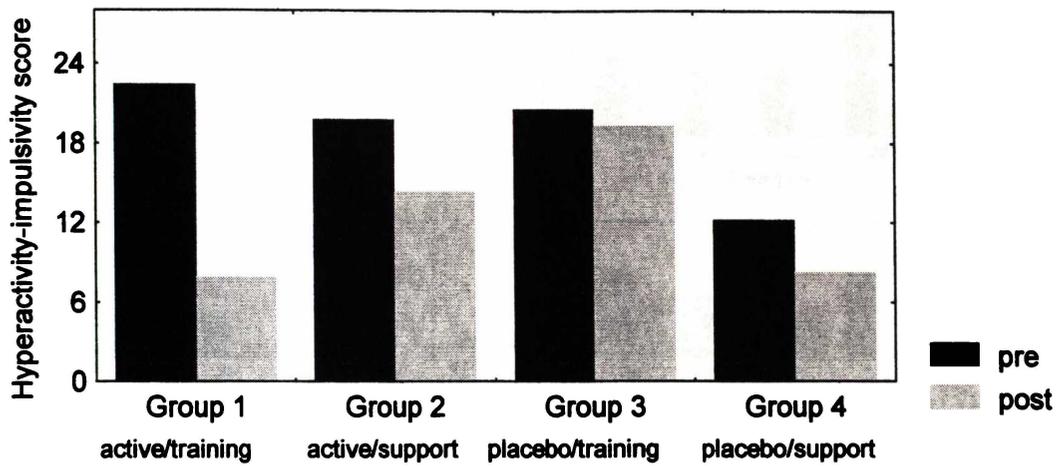
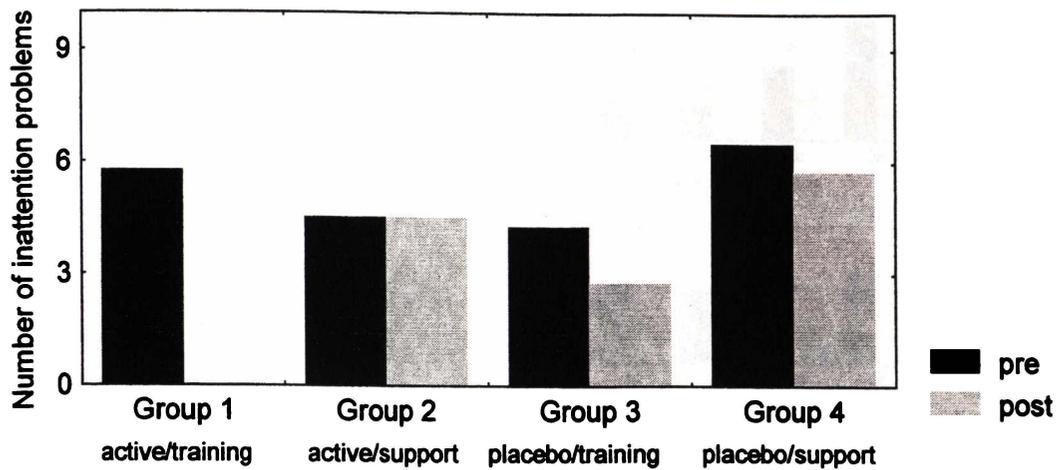


Figure 13. Means for each group pre and post intervention for remaining three measures on ADHD Rating Scale-Teacher Version.

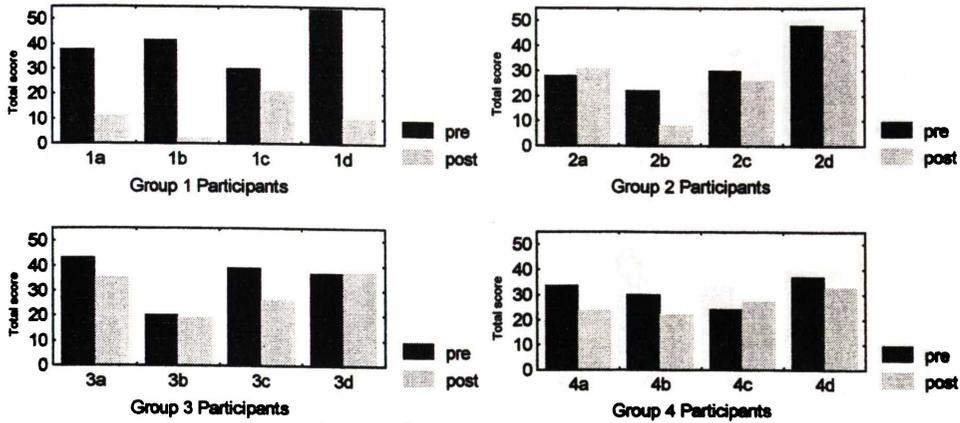


Figure 14. Total score for each participant on ADHD Rating Scale-Teacher Version.

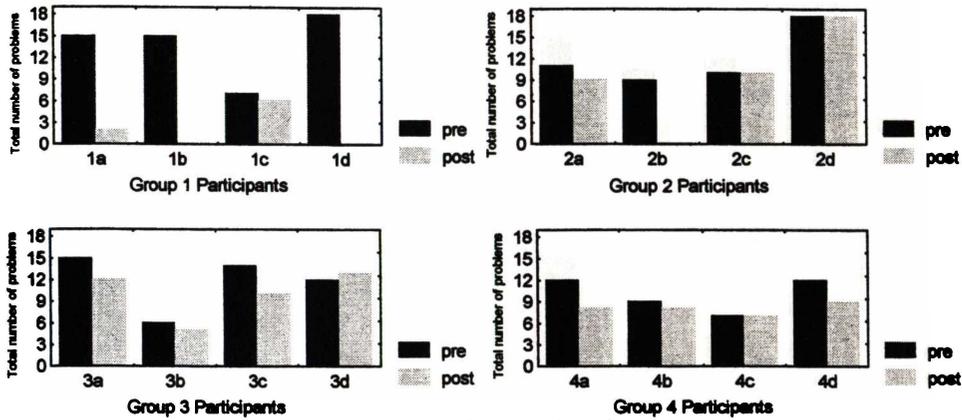


Figure 15. Total number of problems for each participant on ADHD Rating Scale-Teacher Version.

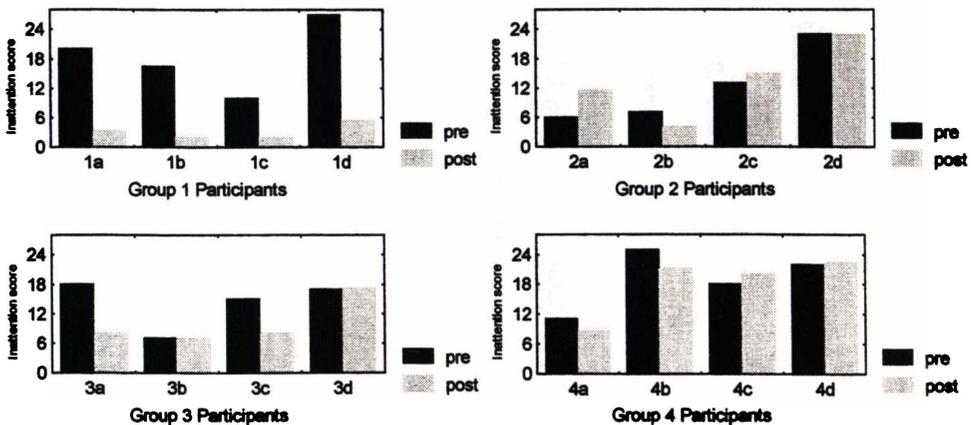


Figure 16. Inattention score for each participant on ADHD Rating Scale-Teacher Version.

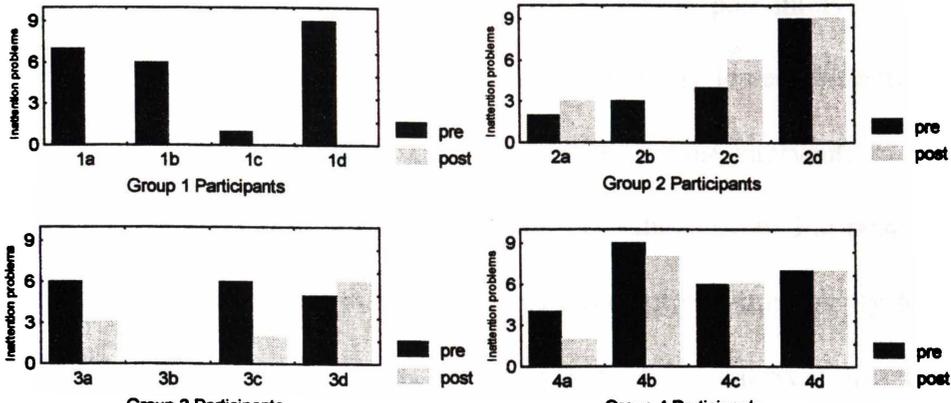


Figure 17. Number of inattention problems for each participant on ADHD Rating Scale-Teacher Version.

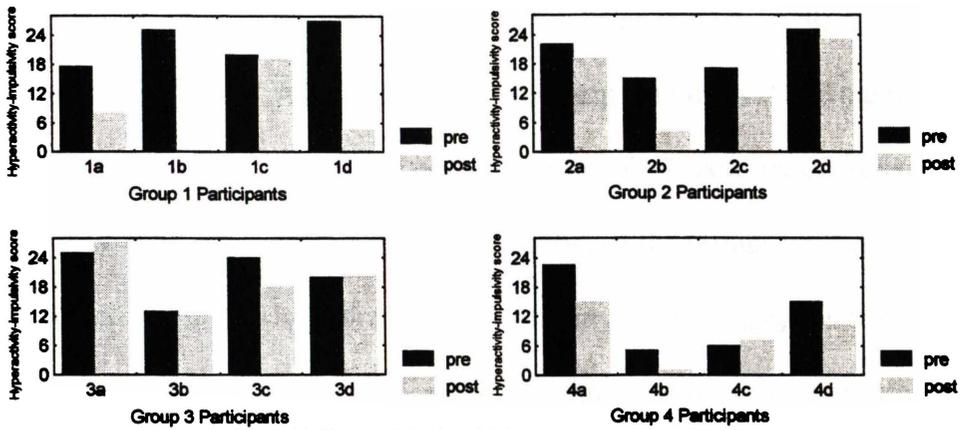


Figure 18. Hyperactivity-impulsivity score for each participant on ADHD Rating Scale-Teacher Version.

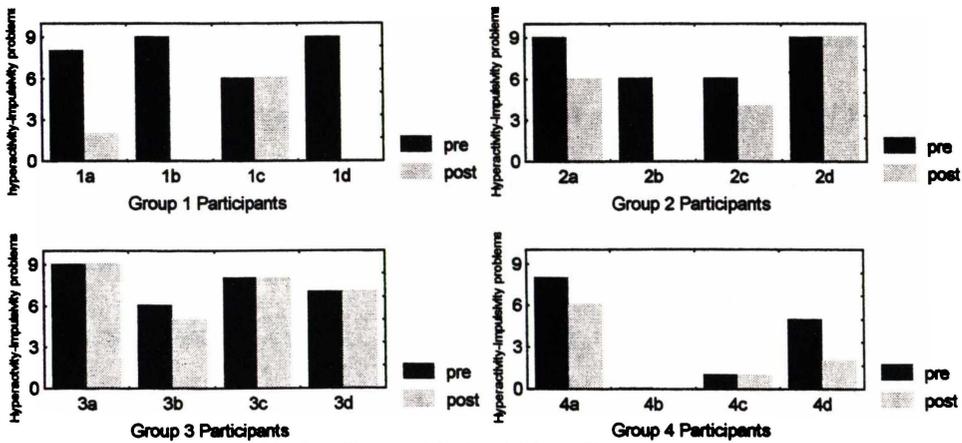


Figure 19. Number of hyperactivity-impulsivity problems for each participant on ADHD Rating Scale-Teacher Version.

Post hoc comparisons show that Group 1 had a significantly lower total score and fewer total problems than the three other groups at post-intervention. Post hoc comparisons also show that Group 1 had a significantly lower inattention score and fewer inattention problems than the other groups at post-intervention. In addition, Group 4 had a significantly lower inattention score than Group 3 at post-intervention. Post hoc comparisons show that the level of hyperactivity-impulsivity for all groups was significantly lower at post-intervention than at pre-intervention. Group 1 had significantly fewer hyperactivity-impulsivity problems at post-intervention compared to pre-intervention. Similarly, Group 1 had significantly fewer problems at post-intervention compared to Group 3, however there were no significant differences between Group 1 and Groups 2 and 4. Participants in Group 3 had significantly more problems at post-intervention compared to Group 4. It is to be expected that there is some variability in pre-intervention scores between the groups on levels of inattention or hyperactivity-impulsivity because children met different diagnostic criteria for type of ADHD. In some groups there are more children with inattention problems and in other groups there are more children with hyperactivity-impulsivity problems.

3. Rating Scale IV (A)-Parent and Teacher versions

Figures 20 and 21 illustrate the means for each group during the course of intervention for each measure on both versions of this scale. On the Parent version, the number of problems for Groups 1 and 2 decreased to within the non-problematic range, however the initial number of problems for those in Group 2 was relatively low. On the Teacher version, there is a clear trend for the ratings in all groups to decrease particularly for Group 1, however the initial level for Groups 1, 2 and 4 was in the non-problematic range. Individual data are presented in Figures 24 to 27, which illustrate considerable variability between participants, and between parent and

teacher ratings. Most parents rated their children's behaviour as more oppositional and defiant than did the teachers. There were marked decreases in parent ratings for Participants 1d and 2b and also teacher ratings for Participant 1d.

Appendix Tables L50 to L61 show that there are no significant effects for either dependent variable ("total score", "number of problems") on the Parent version of this scale. However on the Teacher version, there is a significant main effect for Intervention Phase both for total score, $F(1,12) = 6.54, p < .05, f = .40$, and for number of problems, $F(1,12) = 7.08, p < .05, f = .39$. Post hoc comparisons show that the total level of child oppositional and defiant behaviour for all groups was significantly lower at post-intervention compared to pre-intervention.

4. Conners' Rating Scale-Parent and Teacher versions

Figures 22 and 23 illustrate the means for each group pre- and post-intervention for the two variables on both versions of this scale. On the Global Index variable (a general measure of hyperactivity and behavioural problems) of the Parent version there is no change for Group 3 and an increase in the score, i.e., worsening level, for Group 4. This is well illustrated in the individual data graphs (see Figures 28 to 31). There is a trend for the scores for Groups 1 and 2 to decrease, with scores for Group 2 moving into the average range on this measure. Group 2 scores also decrease to a similar level on the Oppositional subscale. Most of the change in Group 2 however can be attributed to Participant 2b. On the Global Index of the Teacher version however, there is a clear trend for scores in all groups to decrease, with the score for Group 1 moving to well within the average range. On the Oppositional subscale, there is a clear trend for scores in both Groups 1 and 4 to decrease to within

the average range at post-intervention. There is relatively little change in scores for Groups 2 and 3 on this measure.

The Appendix Tables L72 to L73 show that there is a significant main effect for Intervention Phase for the Global Index variable on the Teacher version, $F(1,12) = 18.78, p < .05, f = .45$. Post hoc comparisons show that the mean *T*-score for all groups was significantly lower at post-intervention compared to pre-intervention, decreasing to within the average to borderline range. The tables show that there are no significant effects for either dependent variable on the Parent version of this scale or for the Oppositional subscale on the Teacher version.

5. Conners' Kiddy Continuous Performance Test

Figure 32 illustrates the means for each group on both variables at pre- and post-intervention. While there is a clear improvement (i.e., decrease in score) in performance for Group 1 on both percentage Omissions and percentage Commissions and there is a similar change for Group 4 on percentage Commission, there is a degree of variability in initial performance level across all groups.

Appendix Table L74 shows that there is a significant main effect for Intervention Group on the percentage Omission dependent variable, $F(3,12) = 4.54, p < .05, f = .80$. The mean for Group 1 was significantly lower than the means for the other groups, however, the Levene's Test is significant for both pre- and post-intervention, $p < .05$, indicating significant variation in means. There are no significant effects for percentage Commission (see Appendix Tables L75 to L80). Examination of individual data in Figures 33 and 34 indicates that the scores for all participants in Group 1 decreased from pre- to post-intervention on both dependent variables.

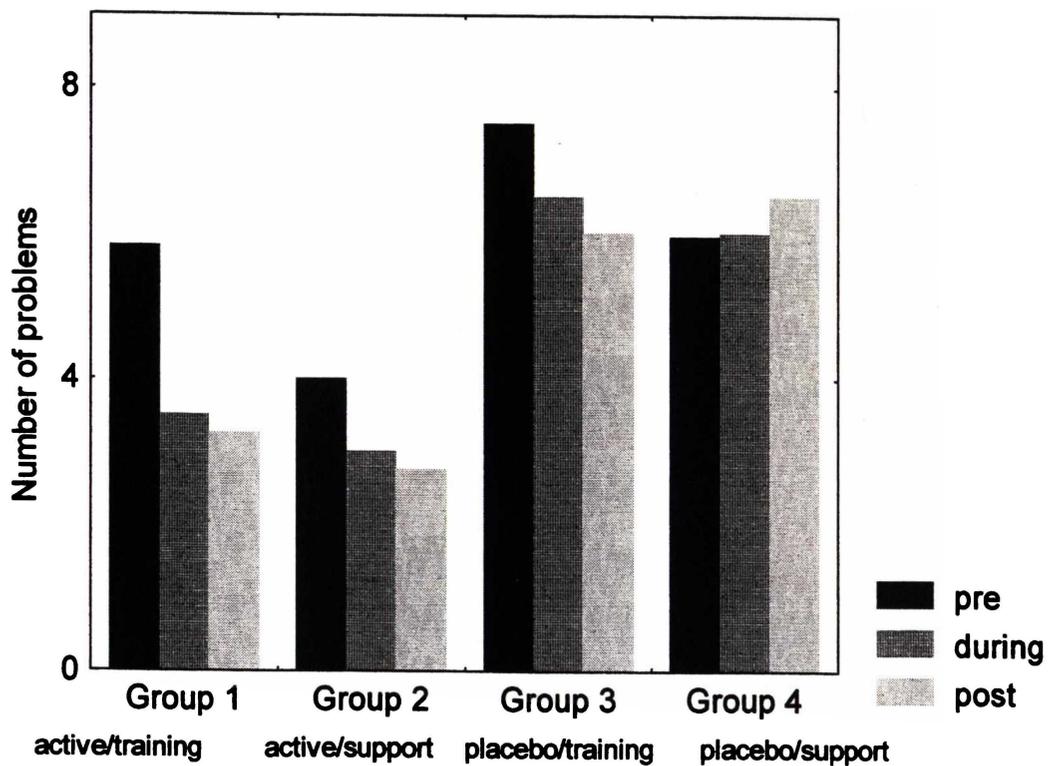
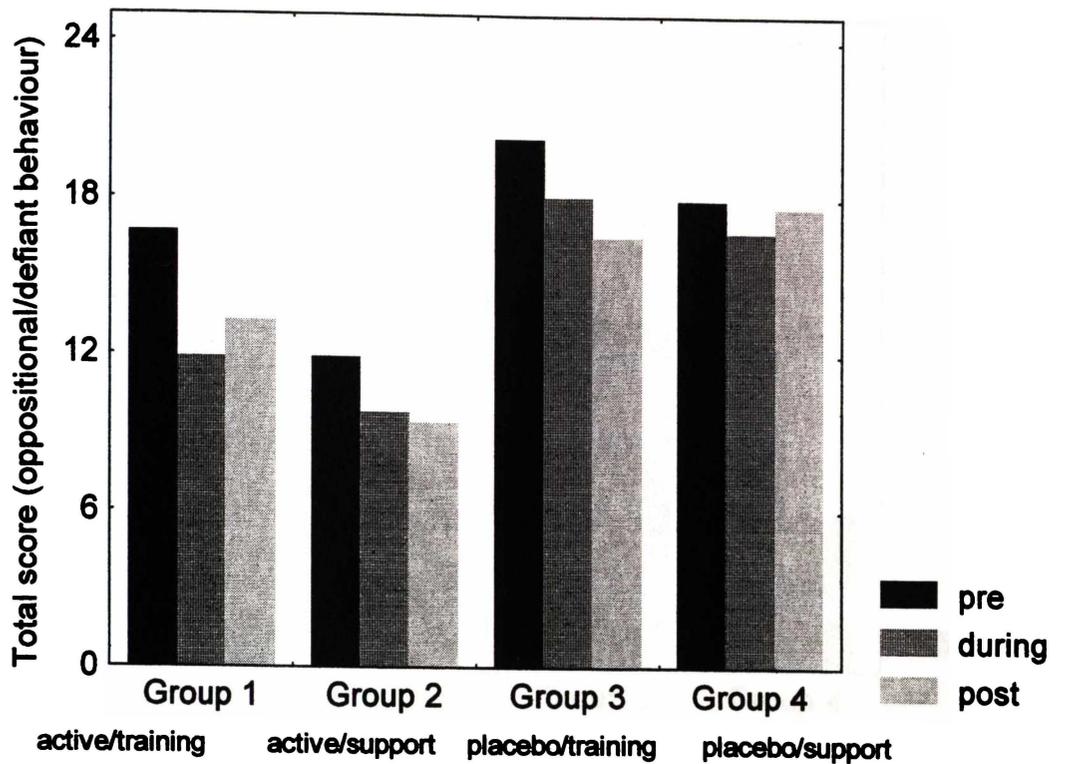


Figure 20. Means for each group pre, during and post intervention for both measures on Rating Scale IV (A)-Parent Version.

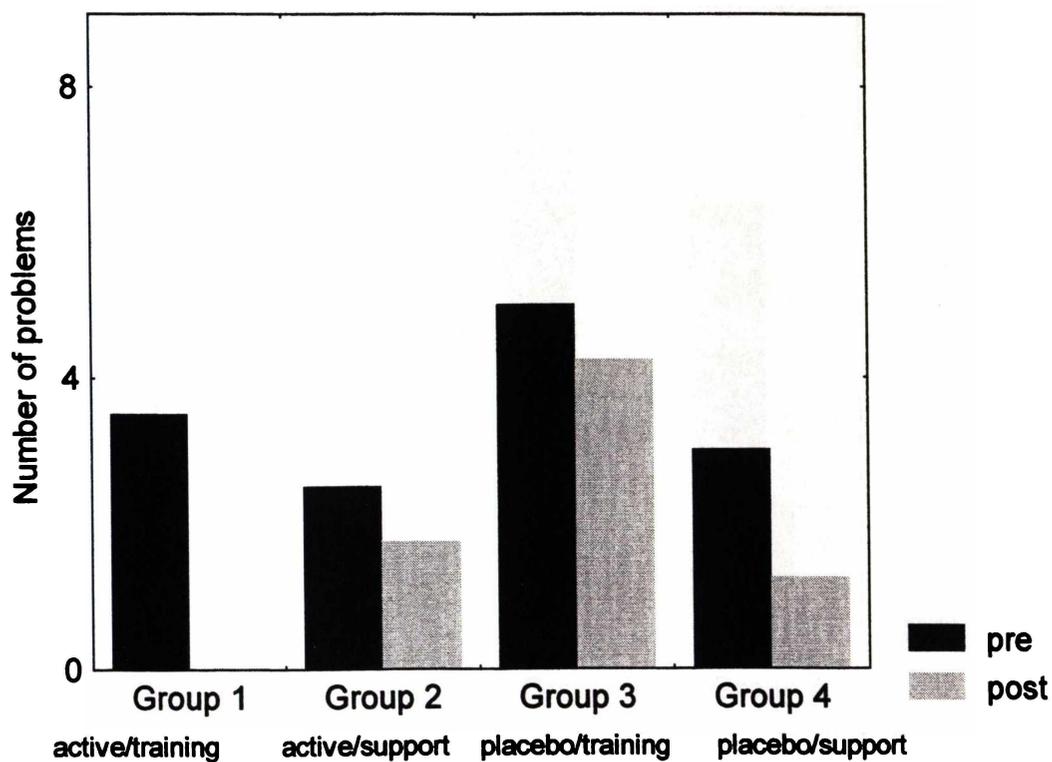
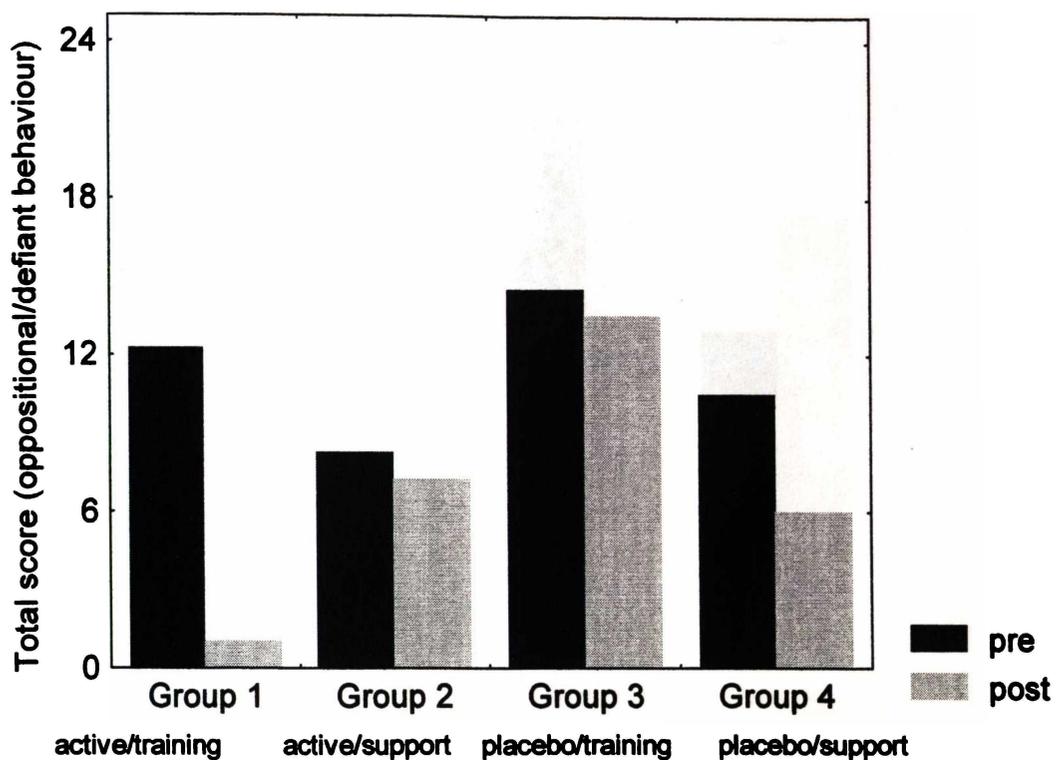


Figure 21. Means for each group pre and post intervention for both measures on Rating Scale IV (A)-Teacher Version.

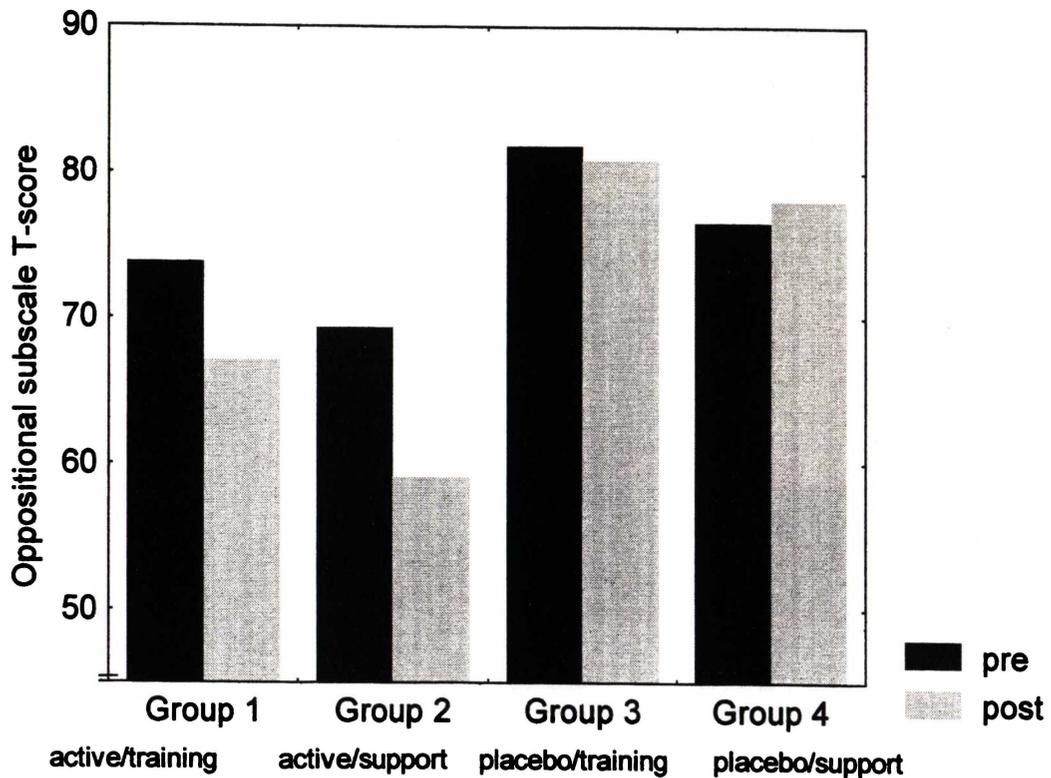
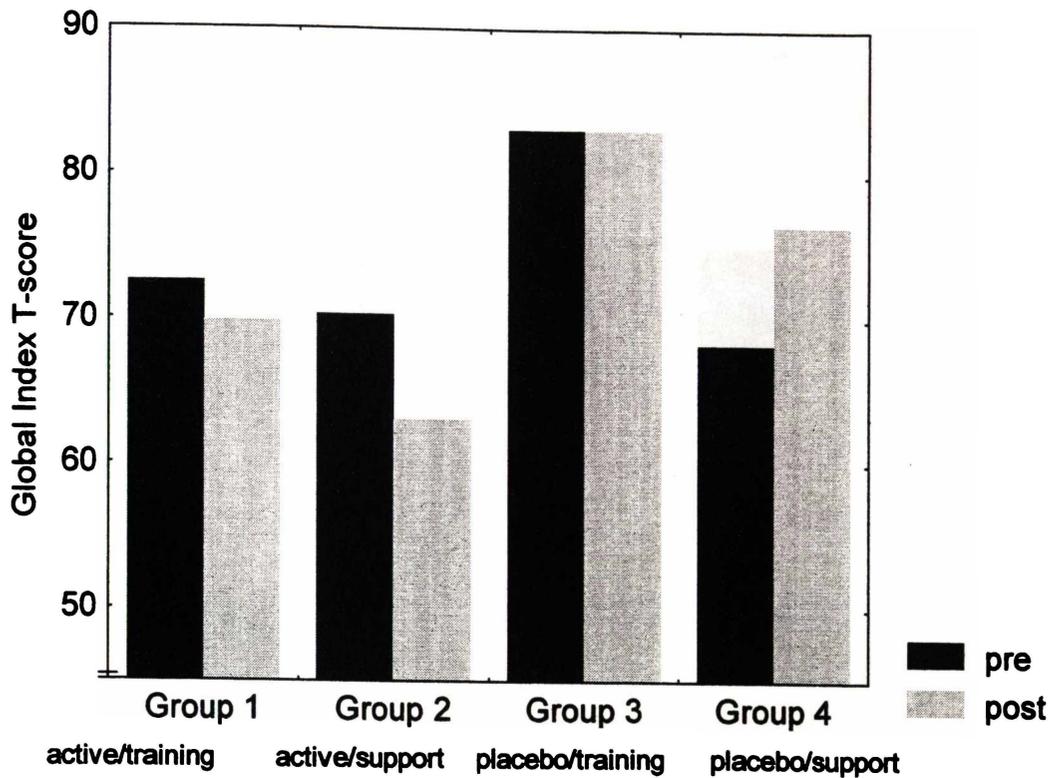


Figure 22. Means for each group pre and post intervention for Conners' Rating Scale-Parent Version.

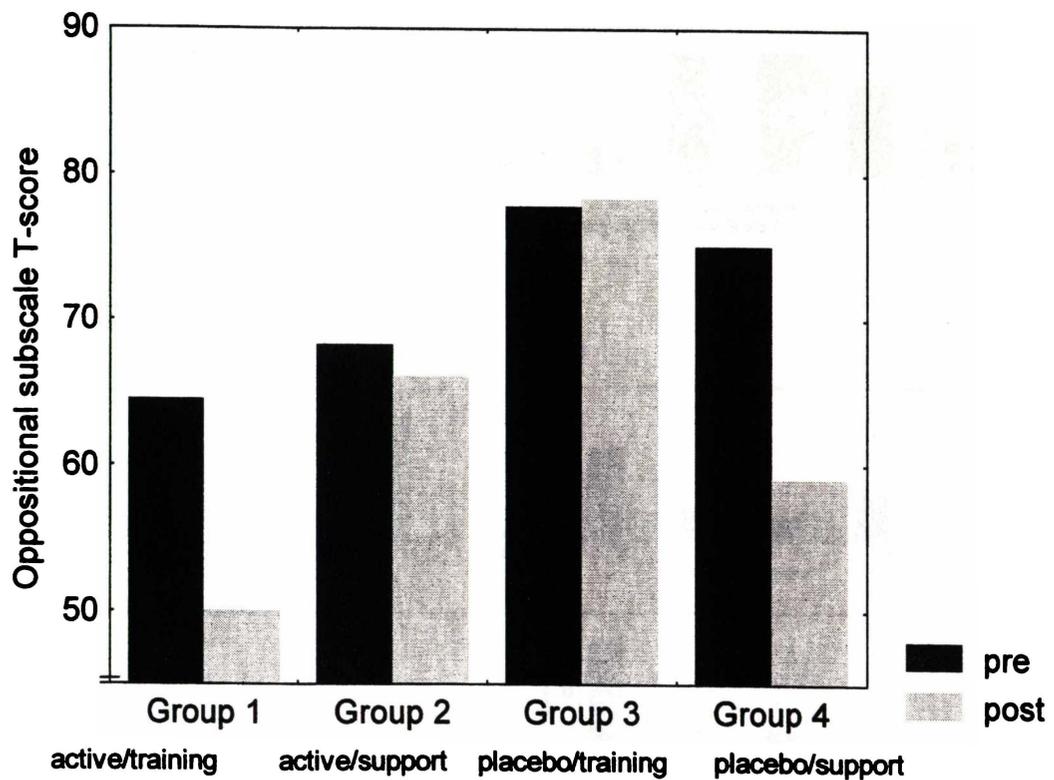
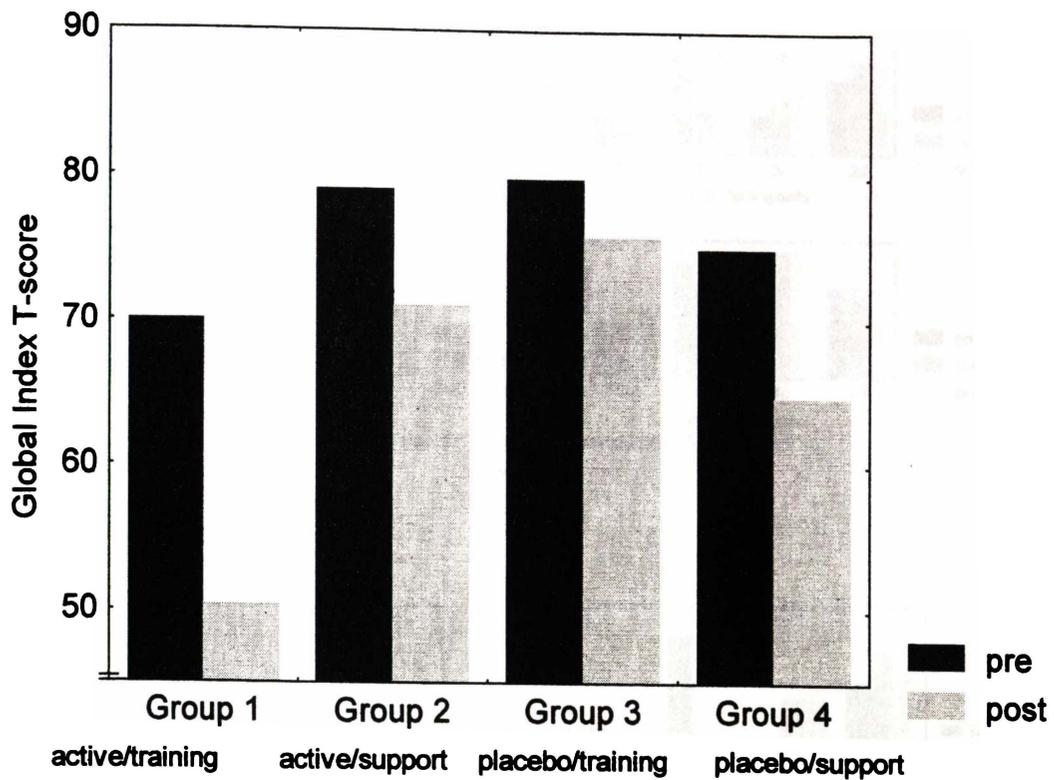


Figure 23. Means for each group pre and post intervention for Conners' Rating Scale-Teacher Version.

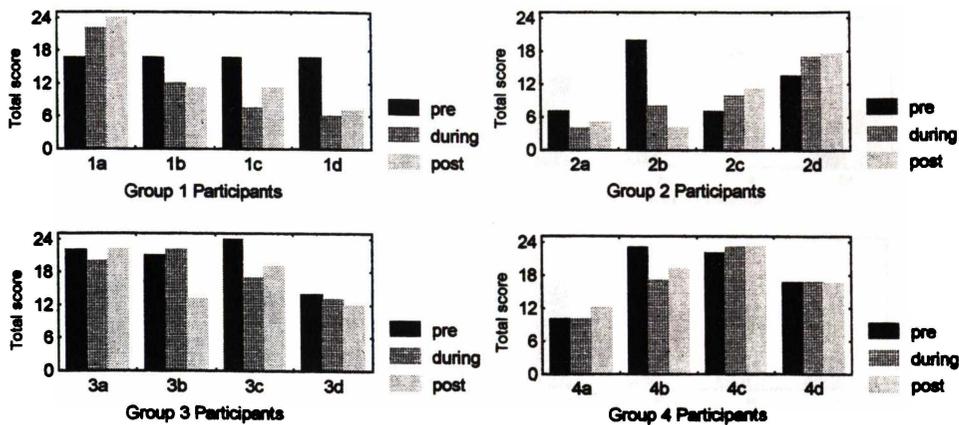


Figure 24. Total score for each participant on Rating Scale IV (A)- Parent Version.

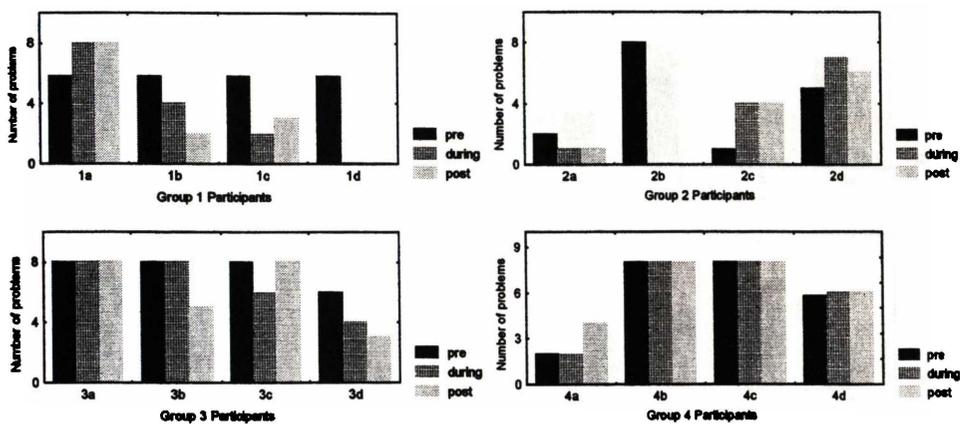


Figure 25. Number of problems for each participant on Rating Scale IV (A)- Parent Version.

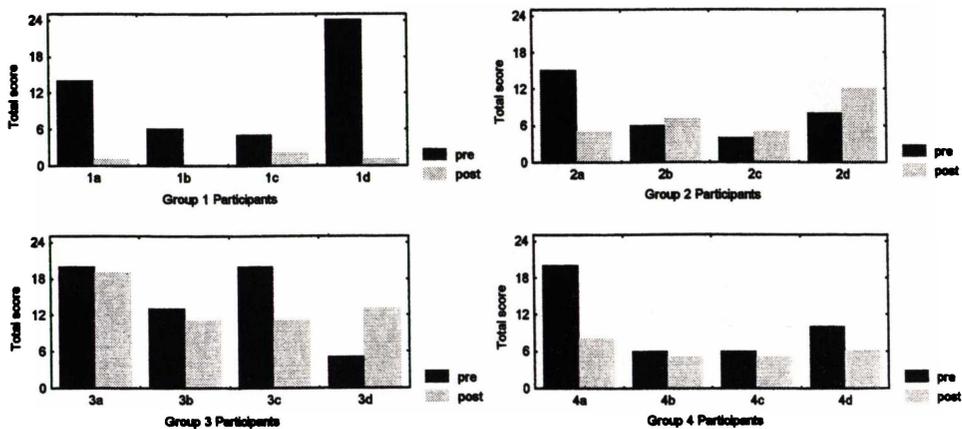


Figure 26. Total score for each participant on Rating Scale IV (A)- Teacher Version.

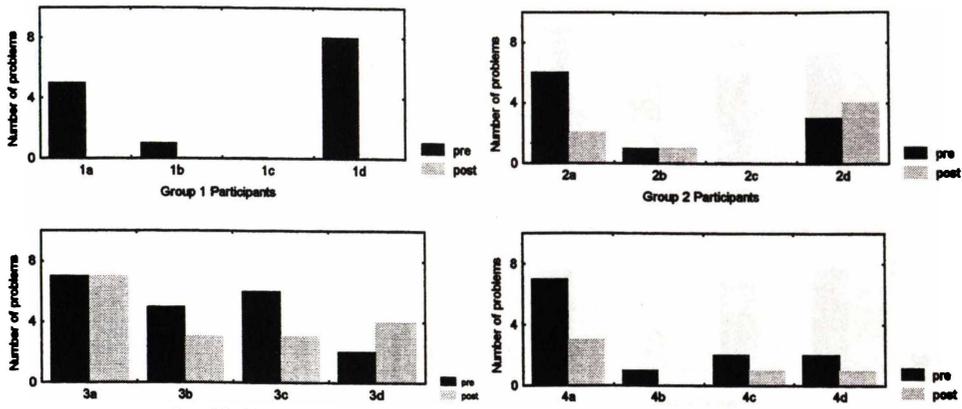


Figure 27. Number of problems for each participant on Rating Scale IV (A)-Teacher Version.

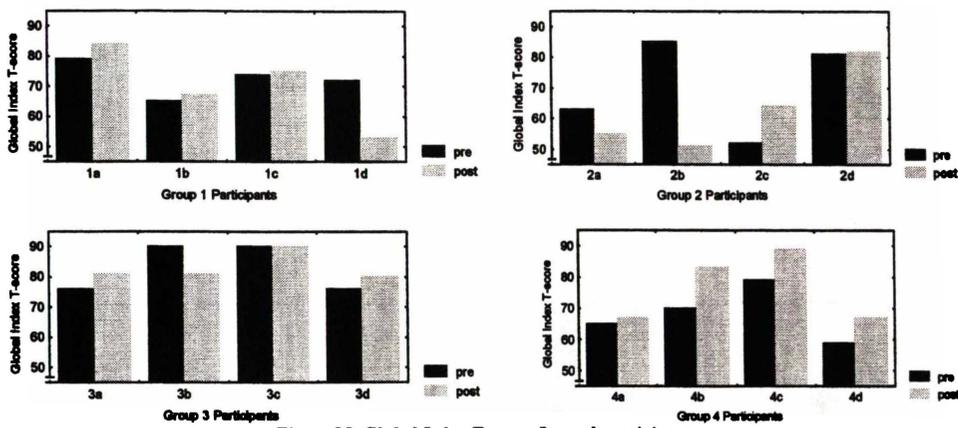


Figure 28. Global Index T-score for each participant on Conners' Rating Scale-Parent Version.

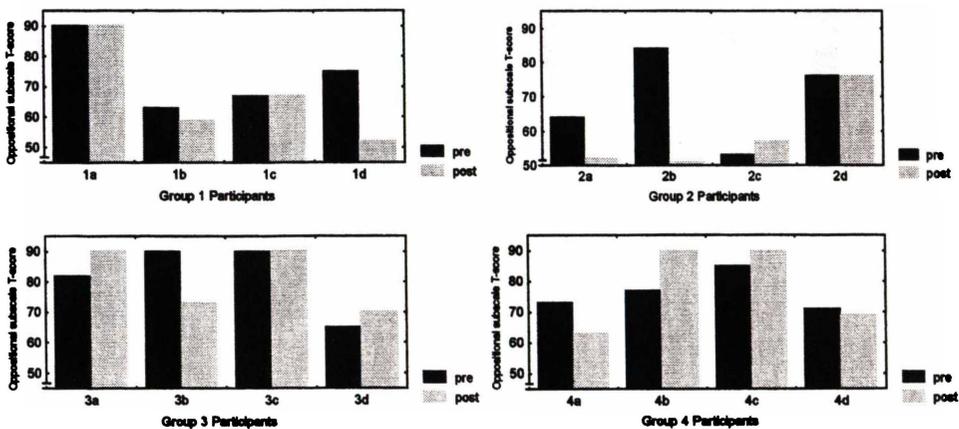


Figure 29. Oppositional subscale T-score for each participant on Conners' Rating Scale-Parent Version.

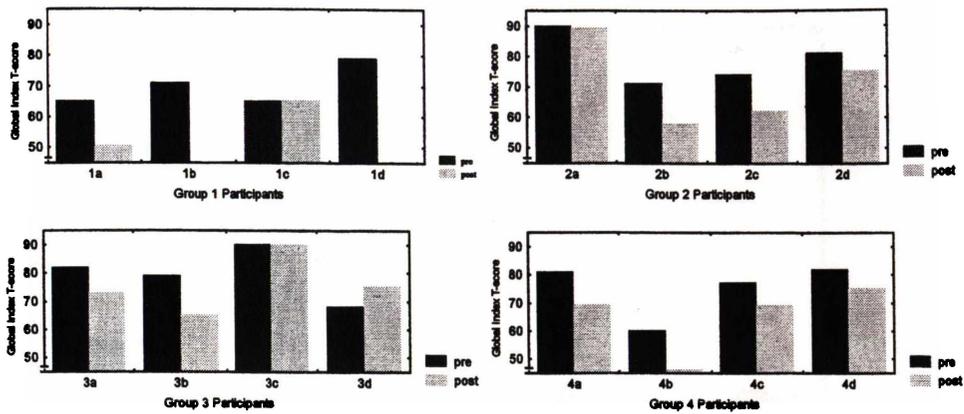


Figure 30. Global Index T-score for each participant on Conners' Rating Scale-Teacher Version.

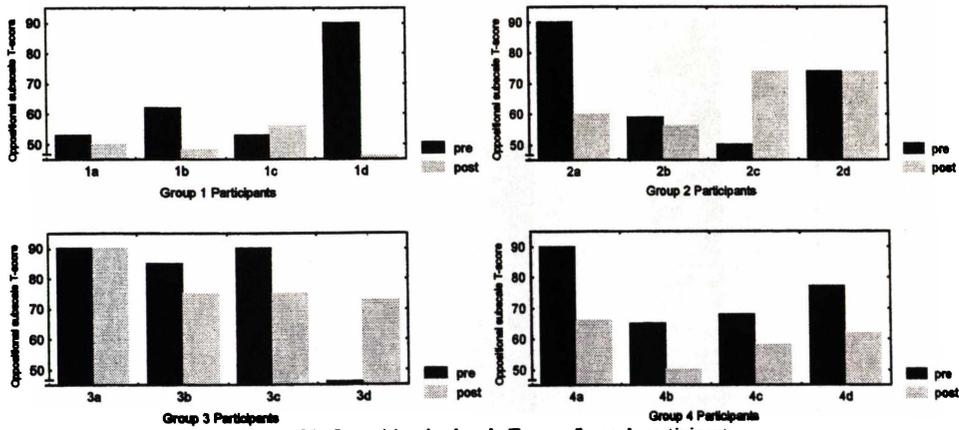


Figure 31. Oppositional subscale T-score for each participant on Conners' Rating Scale-Teacher Version.

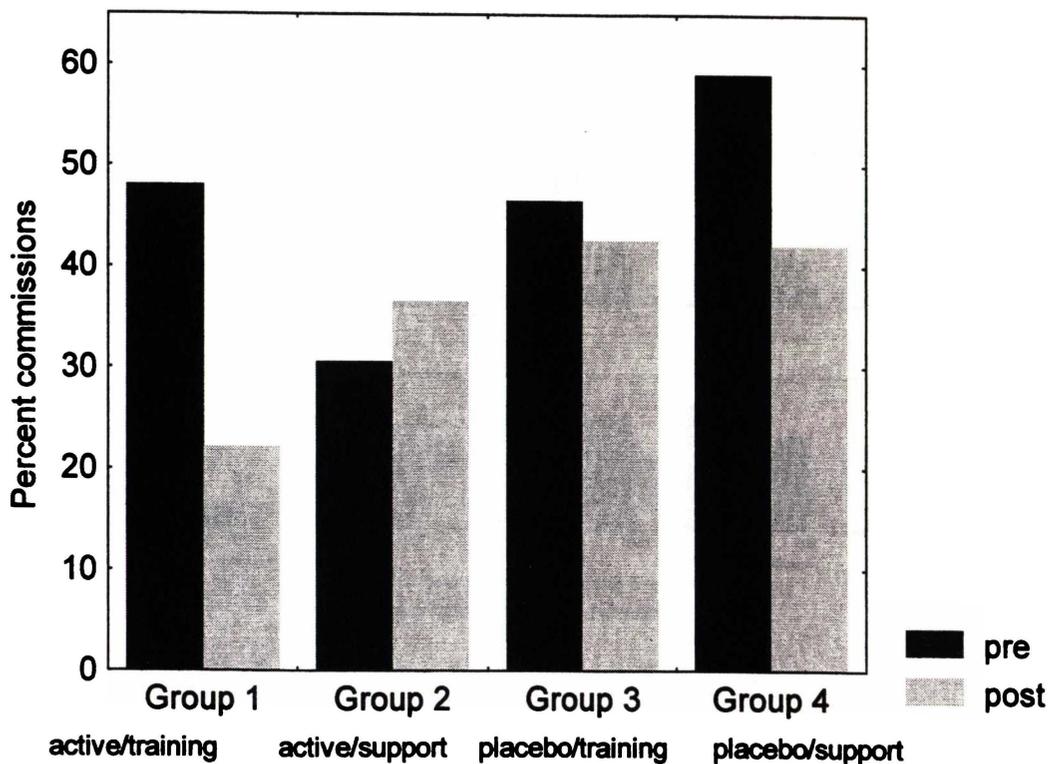
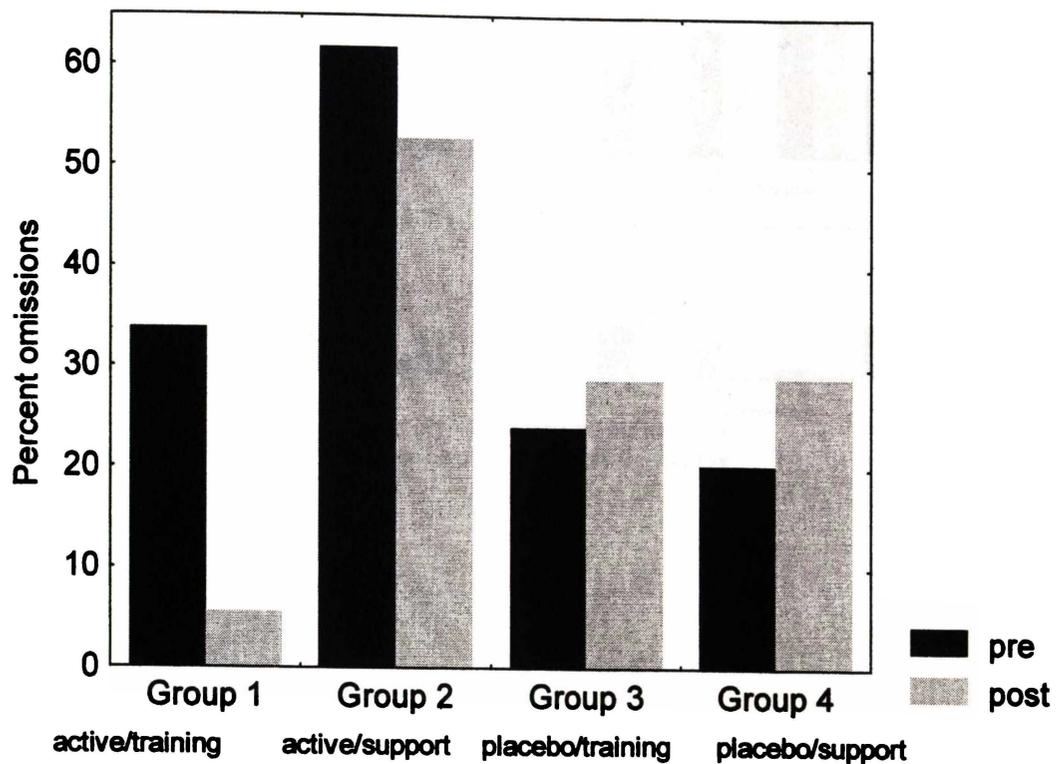


Figure 32. Means for each group pre and post intervention on Conners' Kiddy Continuous Performance Test.

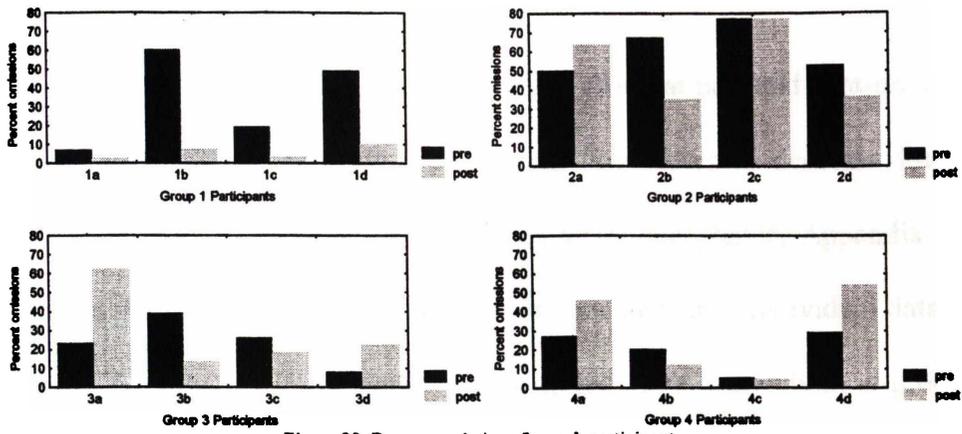


Figure 33. Percent omissions for each participant on Conners' Kiddy Continuous Performance Test.

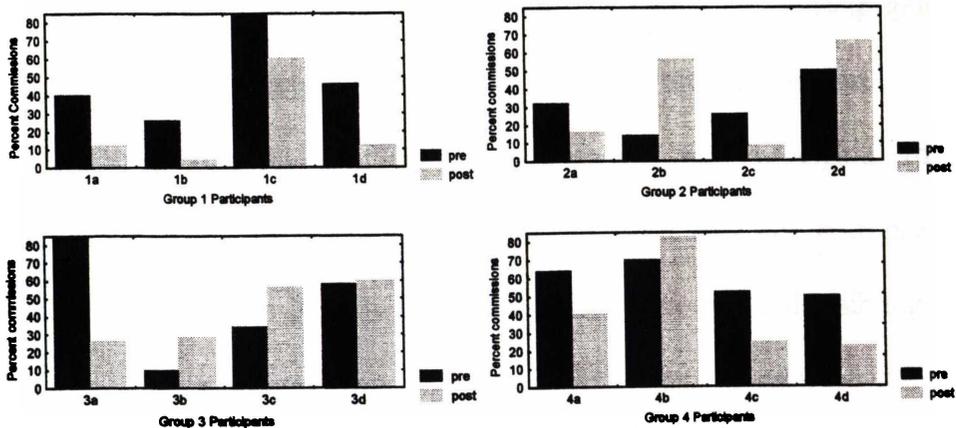


Figure 34. Percent commissions for each participant on Conners' Kiddy Continuous Performance Test.

6. Parent Acceptance-Rejection Questionnaire-Total and Family Environment Scale-Relationship Index

Figure 35 illustrates the means for each group at pre- and post-intervention on both measures. While there is a clear trend for scores to decrease for Group 1, indicating an improvement in the level of parental acceptance, Appendix Table L81 shows that there are no significant effects on this measure. Individual data presented in Figure 36 show that Participants 3a and 4b had high scores both at pre- and post-intervention. Most of the change in Group 1 can be attributed to Participants 1b and 1d.

Figure 35 shows an improvement for all groups on the Family Environment Scale measure and there is a significant main effect for Intervention Phase, $F(1,12) = 6.27, p < .05, f = .20$ (Appendix Table L84). Post hoc comparisons show that the quality of family relationship significantly improved for all groups from pre-intervention ($M=16.07$) to post-intervention ($M=18.05$), although the level of improvement was modest. The overall quality of family relationship generally was below the ideal level that participants had indicated at pre-intervention.

Although the level of problems decreased for Participant 1d on most measures, the quality of family relationship was rated very low both pre- and post-intervention (see Figure 37). In this family there were two older siblings who both had a long history of significant behavioural problems. In addition, the father was away from the family most days working. The quality of family relationships also was rated very low at pre-intervention by Participants 4b and 4c. Both Participant 4c parents had a childhood history of abuse and subsequently were isolated because they had very little family or social support.

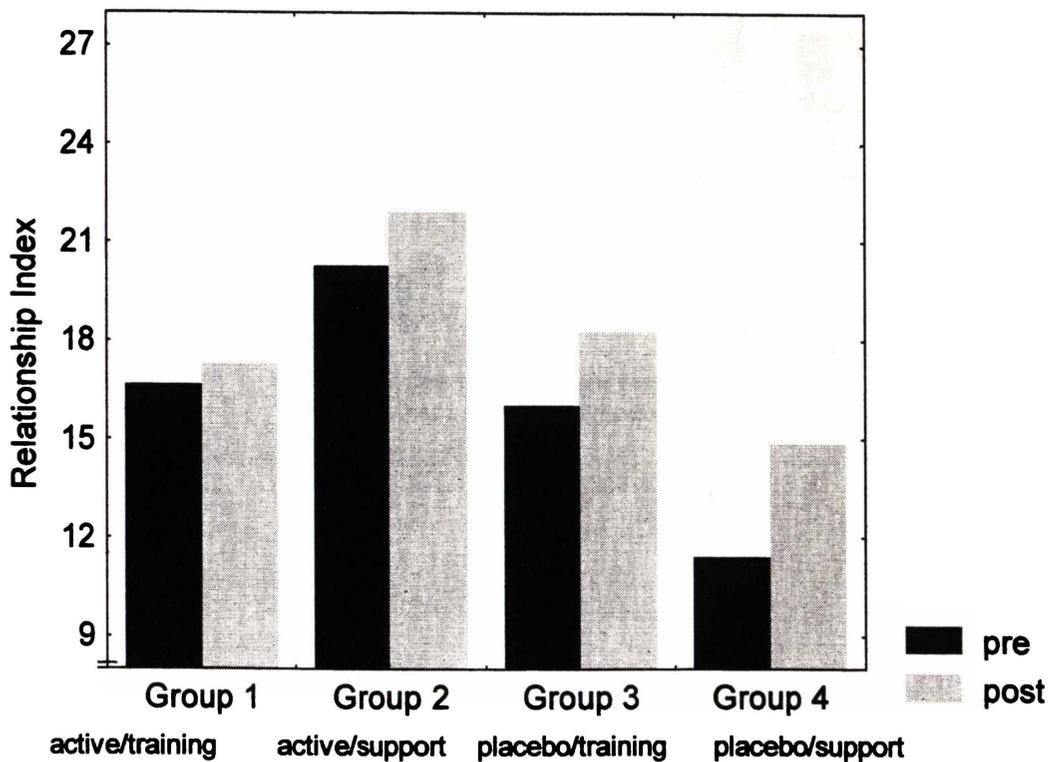
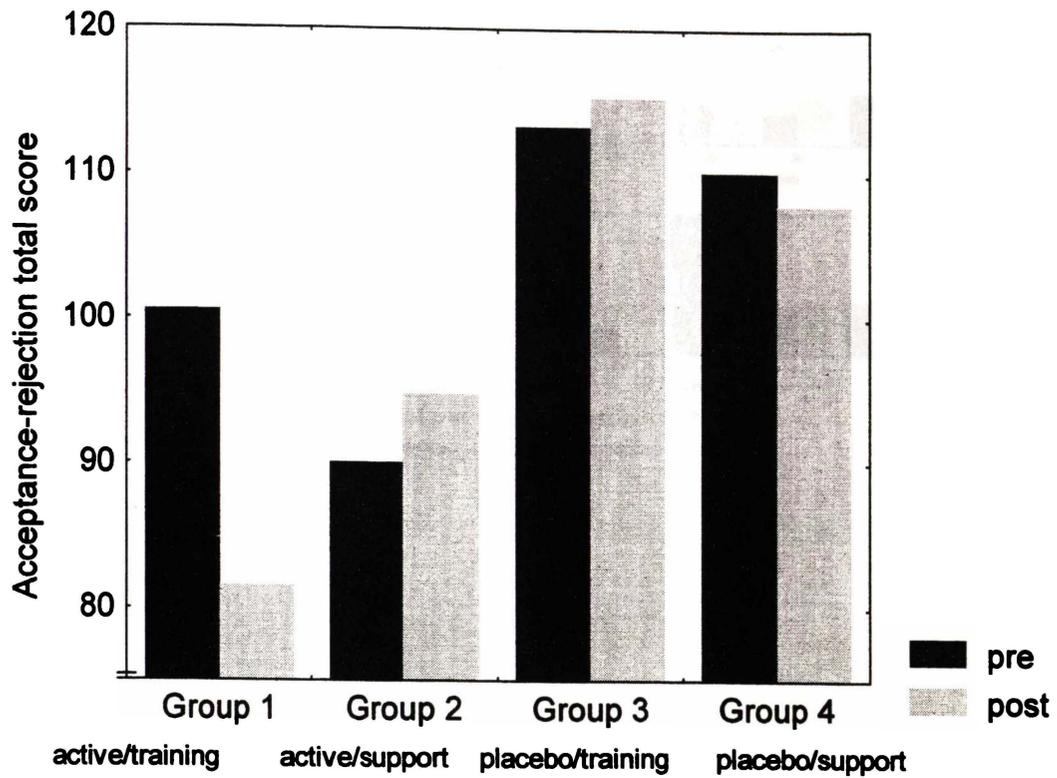


Figure 35. Means for each group pre and post intervention for Parent Acceptance-Rejection Questionnaire and Family Environment Scale.

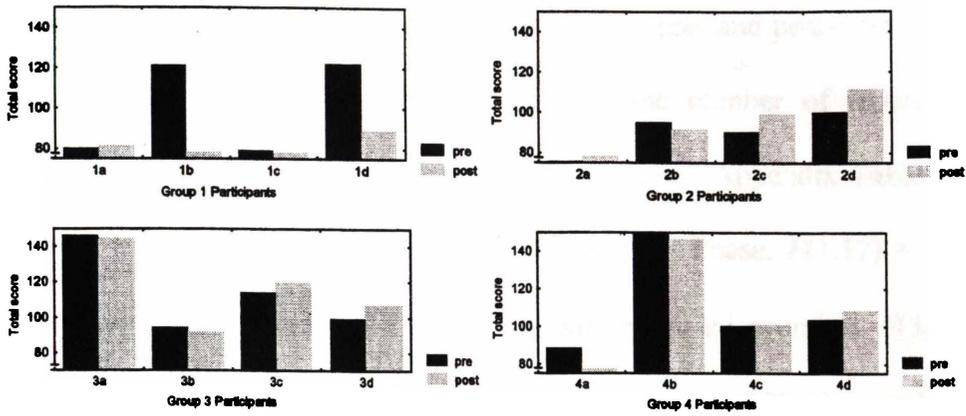


Figure 36. Total score for each participant on the Parent Acceptance-Rejection Questionnaire.

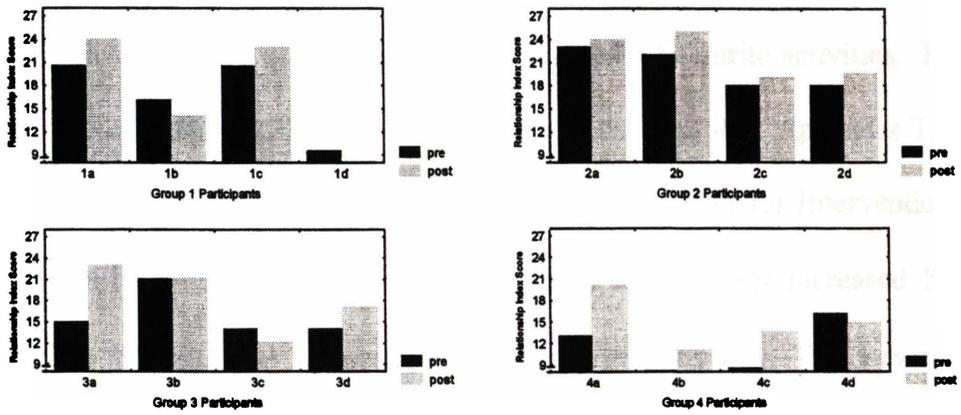


Figure 37. Relationship Index score for each participant on the Real form of the Family Environment Scale.

7. Behavioural observation of parent/child interaction-Compliance task

Figure 38 illustrates means for each group at pre- and post-intervention on the three variables on this task. For all Groups, the number of repeat commands significantly decreases from pre- to post-intervention. Appendix Table L87 shows that there is a significant main effect for Intervention Phase, $F(1,12) = 7.94$, $p < .05$, $f = .48$ however the Levene's Test is significant at pre-intervention, $F(3,12) = 5.30$, $p < .05$. Figure 39 shows that, apart from Participants 1c and 2b, the number of repeat commands for all other participants decreases.

Figure 38 also shows that the level of child compliance increases for all Groups. As shown in Figure 40 the level increases for 10 of the 16 participants. Interestingly, the level decreases for Participants 1c and 2b. Participant 4c had a high initial rate of compliance; this child was videotaped with his father and they spent most of their time drawing together, one of the child's favourite activities. Both pre- and post-intervention levels were very high for Participant 4d. Appendix Table L91 shows that on this measure there is a significant main effect for Intervention Phase, $F(1,12) = 6.14$, $f = .39$, and for all Groups means significantly increased from pre-intervention ($M = 60.25\%$) to post-intervention ($M = 77.40\%$). The Levene's Test however is significant at pre-intervention, $F(3,12) = 4.65$, $p < .05$.

The overall rates of occurrence for percentage of child negative behaviour and especially for the number of parent approvals are very low and there are no significant effects for these measures (see Appendix Tables L95 to L100). As shown in Figure 41, Participant 4a had a high initial rate of child negative behaviour but this was significantly reduced at post-intervention. Across all Groups the mean number of parent approvals given per minute ranged from .03 to .15.

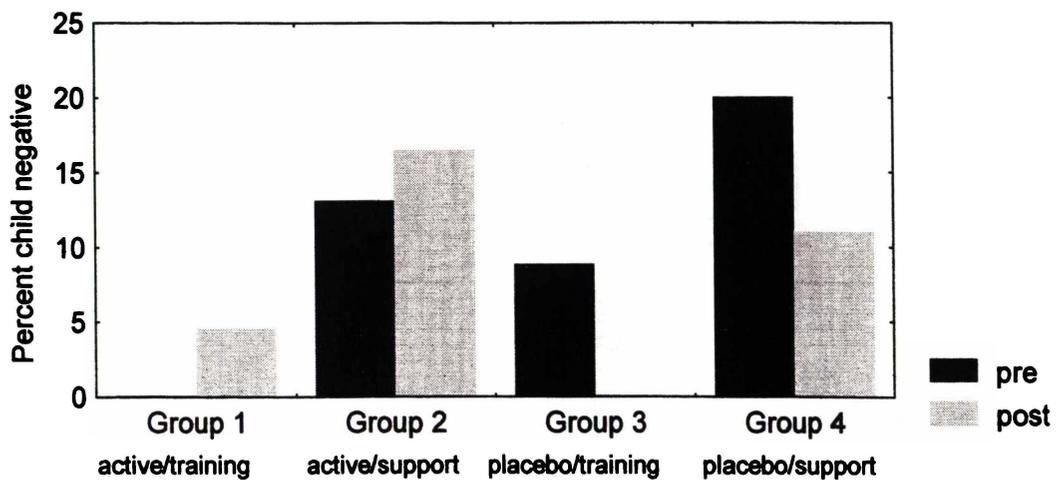
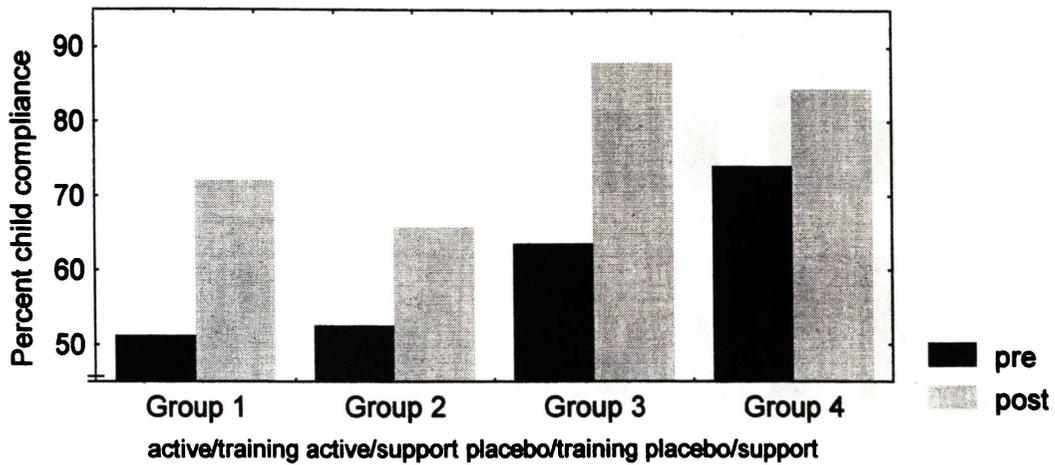
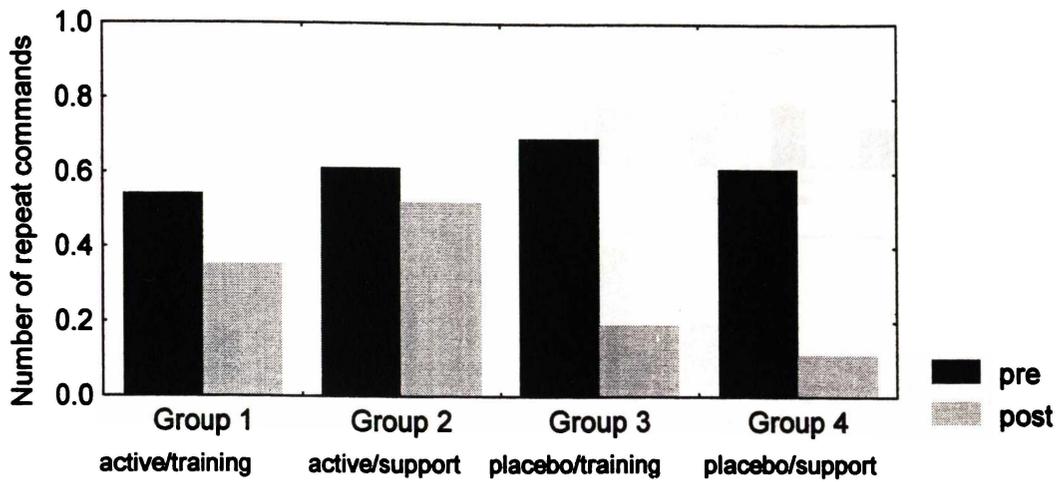


Figure 38. Means for each group pre and post intervention for behavioural observations of parent-child interactions-compliance task.

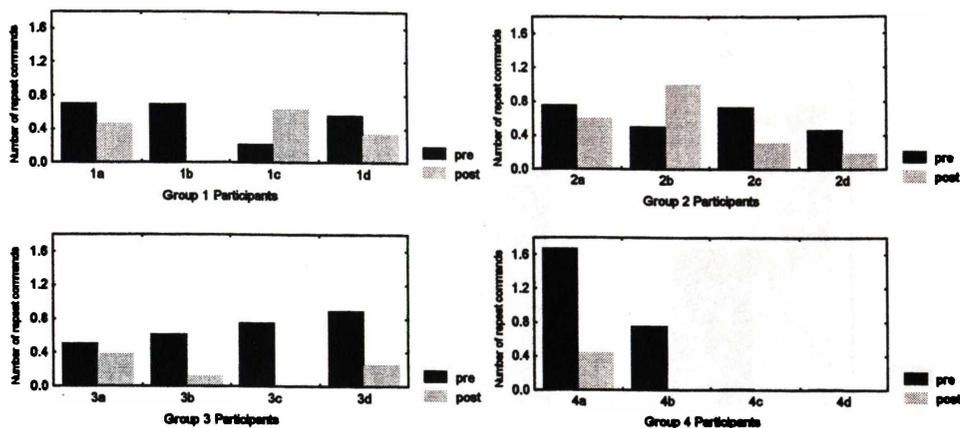


Figure 39. Number of repeat commands for each participant on behavioural observations of parent-child interactions-compliance task.

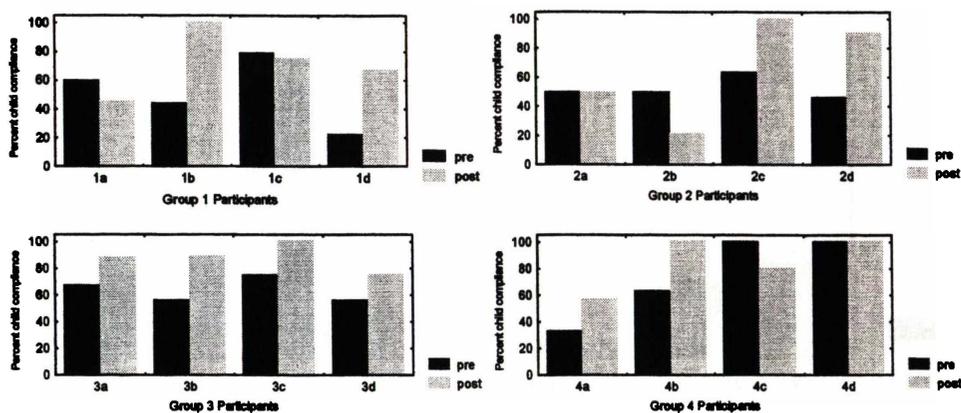


Figure 40. Percent child compliance for each participant on behavioural observations of parent-child interactions-compliance task.

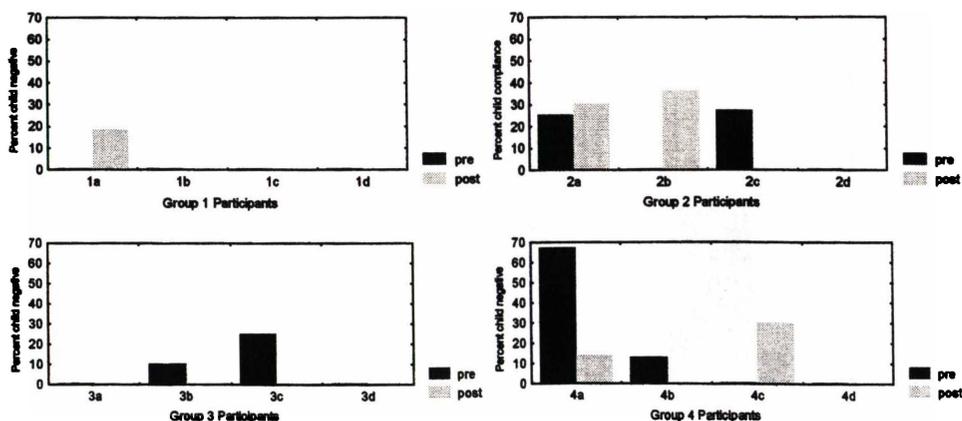


Figure 41. Percent child negative for each participant on behavioural observations of parent-child interactions-compliance task.

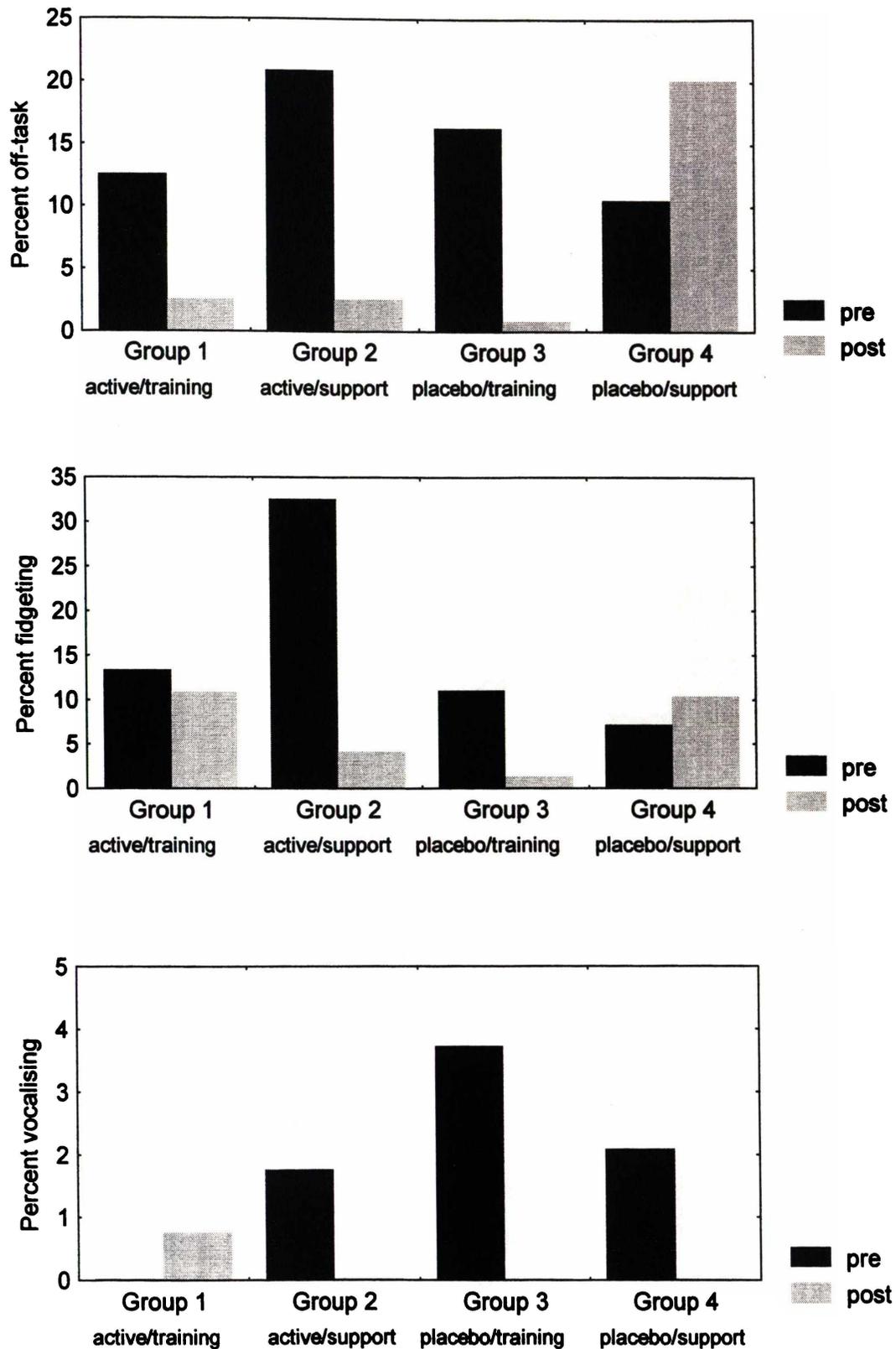


Figure 42. Means for each group pre and post intervention on behavioural observations of parent-child interactions-attention task (1).

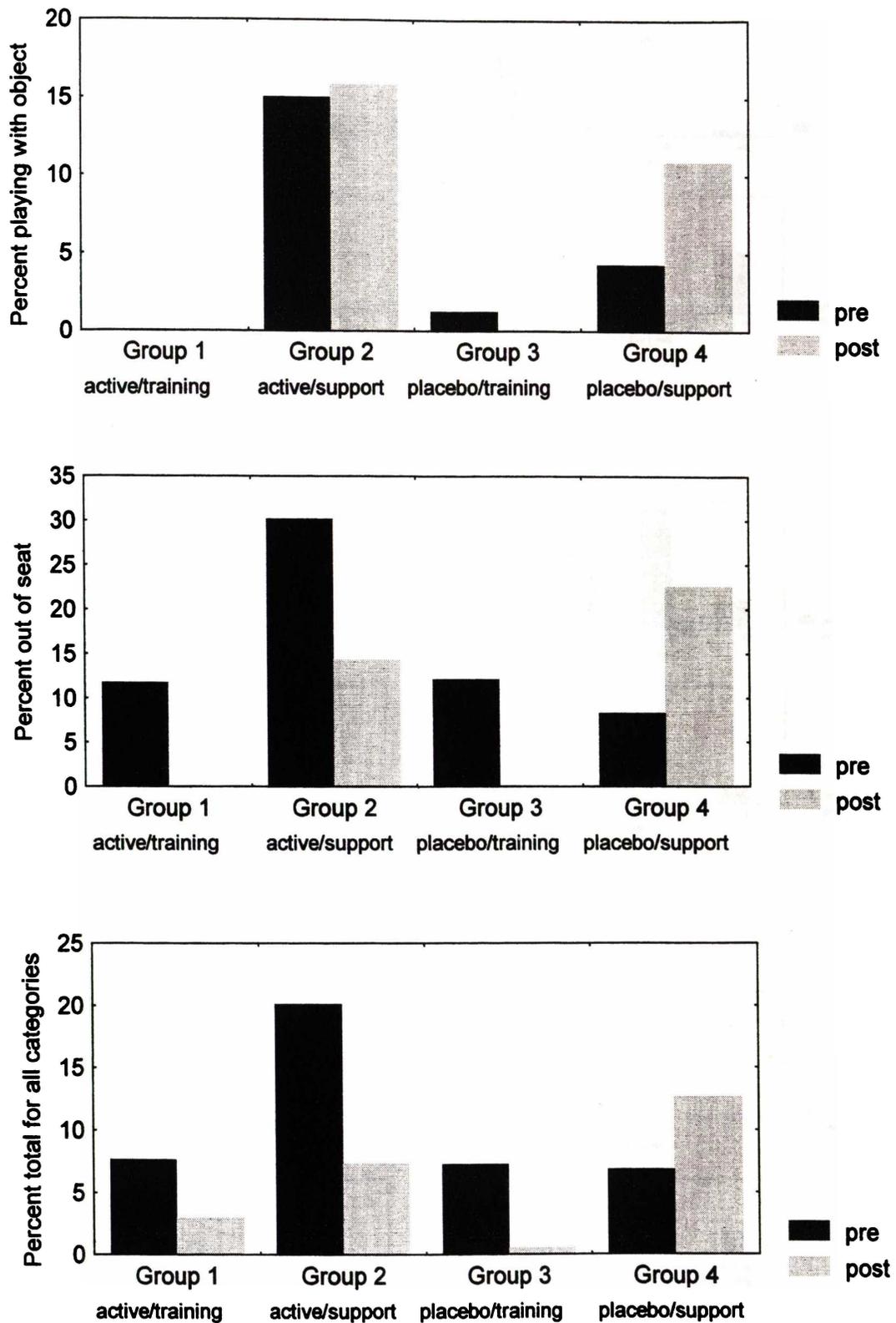


Figure 43. Means for each group pre and post intervention on behavioural observations of parent-child interactions-attention task (2).

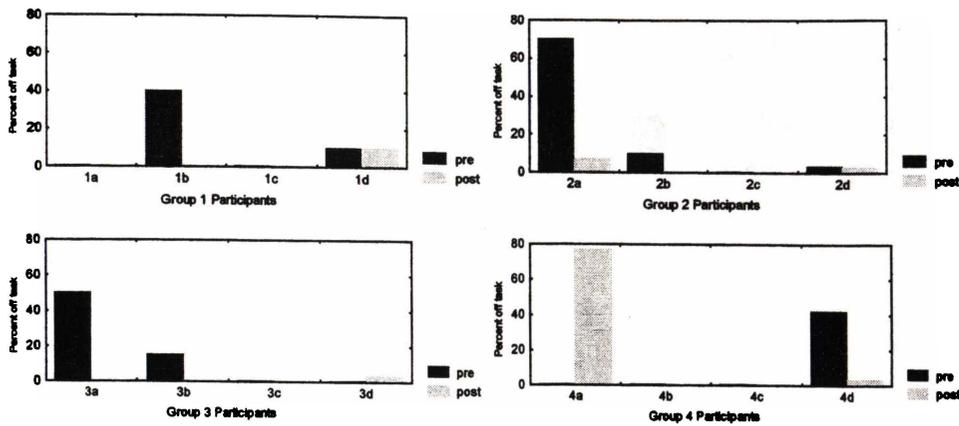


Figure 44. Percent off-task behaviour for each participant on behavioural observations of parent-child interactions-attention task.

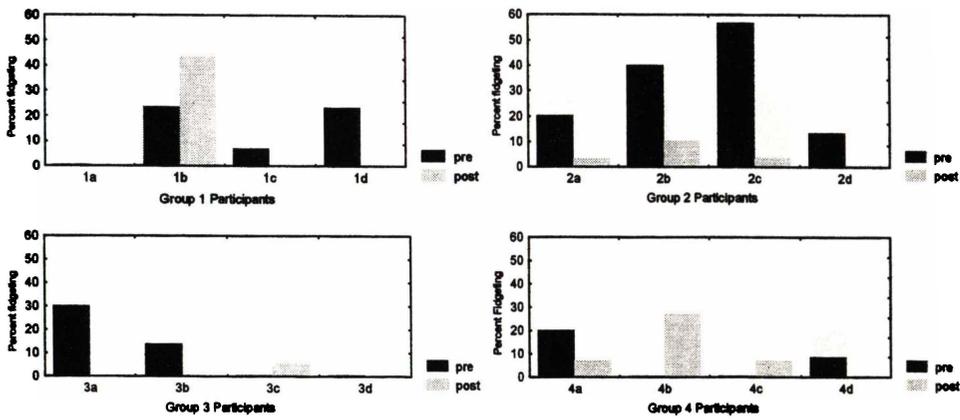


Figure 45. Percent fidgeting behaviour for each participant on behavioural observations of parent-child interactions-attention task.

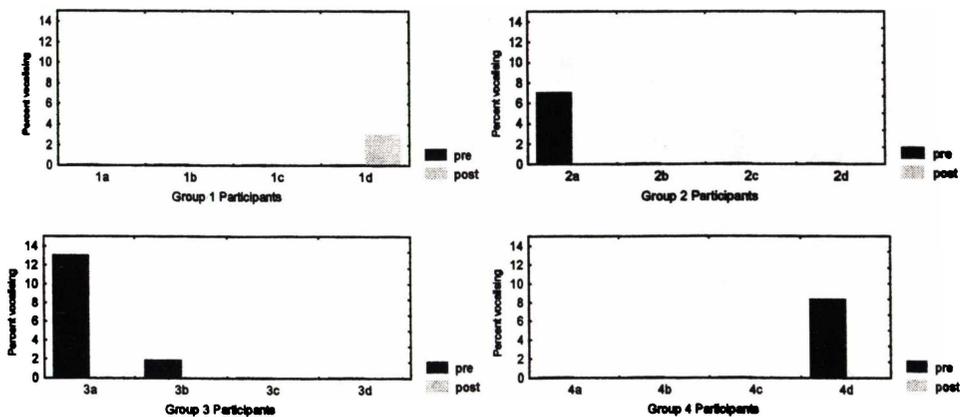


Figure 46. Percent vocalising behaviour for each participant on behavioural observations of parent-child interactions-attention task.

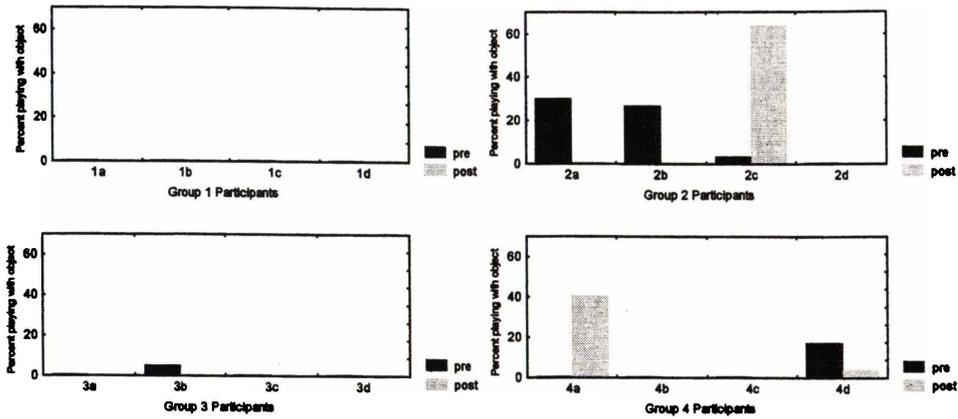


Figure 47. Percent playing with object for each participant on behavioural observations of parent-child interactions-attention task.

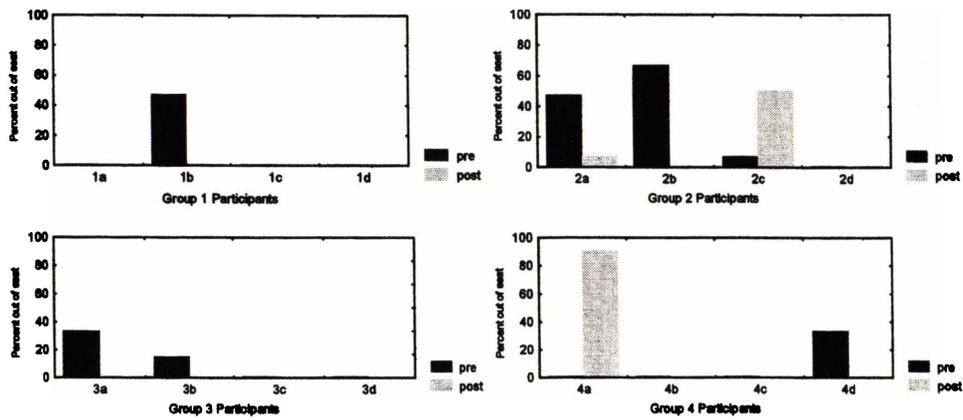


Figure 48 . Percent out of seat for each participant on behavioural observations of parent-child interactions-attention task.

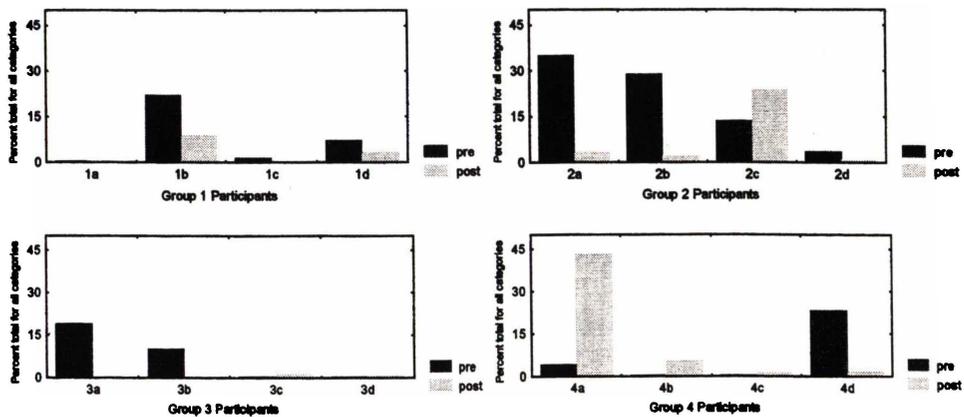


Figure 49. Total percent for all categories for each participant on behavioural observations of parent-child interactions-attention task.

8. Behavioural observation of parent/child interaction-Attention task

For all categories on this measure, there is significant variation in scores largely due to no or very low occurrence of behaviour for some participants in each group. This is illustrated in Figures 42 and 43 which present means for each group on each measure pre- and post-intervention. It is even more clearly illustrated in the individual graphs in Figures 44 to 49. While there are no clear trends across the categories, there is a decrease in attentional behaviour for those in Group 4 and an improvement in Group 2.

The Appendix Tables L101 to L117 show that there is a significant main effect for Intervention Phase, $F(3,12) = 2.50$, $p < .05$, $f = .33$, and for all participants, the percentage of fidgeting significantly decreased from pre-intervention ($M = 15.93\%$) to post-intervention ($M = 6.60\%$). However there are no significant effects for any of the other variables on this measure.

9. Programme evaluation and attendance

Appendix Tables L118 and L119 indicate that there are no significant differences between the Groups in their overall evaluation of the programme, how much they liked the parent group, liked the sessions, or liked medication for their child. There also is no significant difference between Groups in the level of attendance at sessions, although all parents in Group 3 attended all sessions.

MANCOVA Results

To address the second research question (Is comprehensive behavioural intervention or pharmacotherapy more effective than the other?), repeated-measures MANCOVA were performed on the 35 dependent variables. Pharmacotherapy (2 levels [active medication/placebo]) and Behavioural Intervention (2 levels [parent training/support group]) were the two between-subjects factors and Intervention

Phase (either 2 levels [pre/post] or 3 levels [pre/during/post]) was the repeated measures factor. A similar analysis procedure has been used in other research investigating the outcome of multimodal intervention (e.g., Ialongo et al., 1993). The appropriate test for the null hypothesis formulation of this research question is the three-way interaction between Intervention Phase, Pharmacotherapy and Behavioural Intervention. To be able to reject the null hypothesis, I would need to find a significant difference between the active intervention components at post-intervention but not at pre-intervention. As presented below, this specific finding was not obtained for any of the dependent variables. This does not mean that the two treatment components were necessarily of equal effectiveness but only that the null hypothesis, that they were equivalent, could not be rejected. Depending on which measure was examined and who completed the rating scales, two-way interactions between one or another treatment component and Intervention Phase showed significant treatment gains (one treatment component often would produce a significant treatment outcome when the other did not).

Unlike the previous analyses on the four Intervention Groups, there were sufficient numbers in each design “cell” to be able to conduct valid MANCOVAs (see Tabachnick & Fidell, 1989). There were 8 participants in each level of the Pharmacotherapy group and 8 participants in each level of the Behavioural Intervention group. Dependent variables could be grouped in lots of two or three depending on the number of levels in the Intervention Phase factor and the degree of correlation between the variables. Prior to conducting the MANCOVAs, correlational analyses were carried out on the 35 dependent variables (see Appendix K for correlational matrix) and the results were used to help form a basis for structuring and grouping variables in the analyses. Comparisons of parent ratings

with teacher ratings on the ADHD Rating Scale, Rating Scale IV (A) and Global Index and Oppositional subscale of the Conners' Rating Scales were not significantly correlated and therefore parent and teacher ratings subsequently were analysed separately. As indicated earlier, Full Scale IQ was used a covariate. All MANCOVA results are presented in Appendix M. The alpha level was set at .05 for all analyses. Effect size is reported for all significant findings.

1. ADHD Rating Scale-Parent version

(a) Total score and total number of problems

There are no significant effects for these two variables (Appendix Table M1).

(b) Inattention score and number of problems

Appendix Tables M2 to M6 show that there are significant main effects for Behavioural Intervention, $F(2,10) = 14.92, p < .05$, and Intervention Phase, $F(4,9) = 4.73, p < .05$, and that there also is a significant interaction between Pharmacotherapy and Intervention Phase, $F(4,9) = 4.40, p < .05$. Post hoc comparisons show that at post-intervention, children receiving active medication had significantly fewer inattention problems than those receiving placebo medication at any stage, i.e., pre-, during- or post-intervention, $p < .05, f = .25$.

(c) Hyperactivity-impulsivity score and number of problems

Appendix Table M7 shows that there is a significant interaction between Pharmacotherapy and Intervention Phase, $F(4,9) = 4.75, p < .05$. Post hoc comparisons show that children receiving active medication had significantly lower scores ($f = .40$) and fewer problems ($f = .39$) during- and post-intervention than at pre-intervention. In addition, children receiving active medication had significantly

lower scores and fewer problems both during- and post-intervention than children receiving placebo medication (Appendix Tables M8 to M10).

2. ADHD Rating Scale-Teacher version

(a) Total score and total number of problems

Appendix Table M11 shows that there is a significant main effect for Intervention Phase, $F(2,11) = 10.06, p < .05$, and there also is a significant interaction between Behavioural Intervention and Intervention Phase, $F(2,11) = 4.21, p < .05$. Post hoc comparisons show that children whose parents received the parent training programme had significantly lower scores ($f = .30$) and fewer problems ($f = .23$) at post-intervention than those receiving the support group (Appendix Tables M12 to M15).

(b) Inattention score and number of problems

Appendix Table M16 shows that there are significant main effects for Pharmacotherapy, $F(2,10) = 5.20, p < .05$, and for Intervention Phase, $F(2,11) = 9.76, p < .05$. There also are significant interactions between Behavioural Intervention and Intervention Phase, $F(2,11) = 13.11, p < .05$, as well as between Pharmacotherapy, Behavioural Intervention and Intervention Phase, $F(2,11) = 4.89, p < .05$. Children who received active medication and whose parents received parent training had significantly lower scores ($f = .23$) and fewer problems ($f = .20$) at post-intervention compared to those who had active medication but whose parents received the support group ($p < .05$). These children also had significantly lower scores and fewer problems at post-intervention than children who received placebo medication, irrespective of which group their parents were allocated. Children who received placebo medication and whose parents received parent training had significantly

lower scores at post-intervention than those whose parents received the support group (see Appendix Tables M17 to M19).

(c) Hyperactivity-impulsivity score and number of problems

The Appendix Table M20 shows that there is a significant main effect for Intervention Phase, $F(2,11) = 7.60, p < .05$. Post hoc comparisons indicate that for all children the hyperactivity-impulsivity score and number of problems were significantly lower at post-intervention than at pre-intervention, $p < .05, f = .44$.

3. Rating Scale IV (A)-Parent and Teacher versions

The Appendix Tables M22 and M23 show that there are no significant effects on both versions of this scale for both dependent variables (measures of oppositional and defiant behaviours).

4. Conners' Rating Scale-Parent versions (Oppositional subscale and Global Index)

The Appendix Tables M24 and M26 show that there is a significant main effect for Intervention Phase on both the parent and teacher versions of this scale, $F(2,11) = 5.57, p < .05$, and $F(2,11) = 8.62, p < .05$, respectively. While post hoc comparisons indicate that the Global Index T-score (a general measure of hyperactivity) at post-intervention was significantly lower than at pre-intervention and within the average to borderline range on the teacher version ($f = .45$), no other comparisons between means are significant (see Appendix Tables M25 and M27).

5. Conners' Kiddy Continuous Performance Test (percentage Omissions and percentage Commissions)

The Appendix Table M28 shows that there is a significant main effect for Intervention Phase, $F(2,11) = 7.29, p < .05$. There are significant interaction effects between Pharmacotherapy and Intervention Phase, $F(2,11) = 5.95, p < .05$, as well as

between Pharmacotherapy, Behavioural Intervention and Intervention Phase, $F(2,11) = 6.22, p < .05$. Post hoc comparisons show that children receiving active medication and whose parents received parent training had significantly lower omission scores (i.e., they missed significantly fewer targets) at post-intervention compared to children who received active medication but whose parents received the support programme (see Appendix Tables M29 to M31). The magnitude of this effect was small, $f = .08$.

6. Parent Acceptance-Rejection Questionnaire-Total and Family Environment Scale-Relationship Index

The Appendix Table M32 shows that there is a significant main effect for Intervention Phase, $F(2,11) = 4.20, p < .05$. While post hoc comparisons for the Parent Acceptance-Rejection variable are not significant, post hoc comparisons for the Family Environment Scale variable indicate that the quality of family relationships had improved significantly for all participants at post-intervention, $f = .20$ (Appendix Table M33).

7. Behavioural observation of parent/child interaction—Compliance task (“repeat commands”, “child compliance”, “child negative”)

Appendix Table M34 shows that there is a significant main effect for Intervention Phase, $F(3,10) = 4.48, p < .05$. Post hoc comparisons demonstrate that for all participants the number of repeat commands issued by parents significantly decreased ($f = .48$) and the percentage of compliance by the child to parental commands significantly improved ($f = .40$) from pre- to post-intervention (Appendix Table M35).

8. Behavioural observation of parent/child interaction – Attention task

The Appendix Tables M36 to M38 present MANCOVA results for the following combinations of dependent variables on this task (a) “off task”, “vocalising” and “total score”, (b) “playing with object”, “out of seat” and “total score”, (c) “fidgeting” and “total score”. As shown in these tables, there are no significant effects for these variables.

Extent of Normalisation due to Intervention

Irrespective of Intervention Group condition, 7 of the 16 children no longer met diagnostic criteria for ADHD at the end of the study, using *DSM-IV* (1994) criteria as outlined in the Method; there were two children from Group 1, three from Group 2 and one each from Groups 3 and 4. Of the four children who met criteria for ADHD combined-type pre-intervention, two no longer met diagnostic criteria for ADHD at all at post-intervention. Of the nine children who met diagnostic criteria for predominantly hyperactive-impulsive type, four no longer met diagnostic criteria for ADHD at all, four still met diagnostic criteria for the same category and one had worsened and met diagnostic criteria for combined-type. Of the three children who had met criteria for predominantly inattentive-type, one no longer met diagnostic criteria for any type of ADHD, however there was no change for the two other children. In addition, 2 of 5 children who had initially met criteria for Oppositional Defiant Disorder no longer did so following intervention; one child was from Group 1 and one child was from Group 3.

The Reliable Change Index procedure (Jacobsen & Truax, 1991) was used to assess clinical significance of change due to intervention. The Reliable Change Index is equal to the difference between a child’s pre-treatment and post-treatment score divided by the standard error of difference between the two test scores. When this exceeds 1.96 it is assumed that change is due to the effects of treatment rather than

chance ($p < .05$). Standard errors of difference for the ADHD Rating Scale have been reported by DuPaul et al. (1998, pp. 65-66) and have been used here to provide an indication of the level of change. The standard errors of difference for the 5- to 7-year-old age are used as no norms are reported for younger children. The difference between pre-intervention and post-intervention scores on the parent version of the ADHD Rating Scale and a summary of the degree of change for each group are presented in Tables 7 and 8, respectively. The difference between pre-intervention and during-intervention scores, and during-intervention and post-intervention scores together with the summary tables of the degree of change are presented in Appendix N (parent version only). The difference between pre-intervention and post-intervention scores on the teacher version of the ADHD Rating Scale and the degree of change for each group are presented in Tables 9 and 10, respectively.

The general trend, as indicated earlier in this section, is that greatest degree of positive change (as rated by both parents and teachers) was exhibited by participants in Group 1 compared to participants in the other groups. Participants in Group 2 showed the next level of positive change, followed by Groups 3 and 4. This trend occurred on the Total Score and also on the Inattention and Hyperactivity-Impulsivity Scores. Based on the Total score for the parent version, 10 children were rated as being better or significantly better, while 6 children were rated as being the same or worse compared to pre-intervention status. On the teacher version, 13 children were rated as being better or significantly better, while 3 children were rated as being the same or worse compared to pre-intervention scores.

The change in scores between pre- and during-intervention and during- and post-intervention on the parent version tend to indicate a decrease in the level of improvement for participants in Groups 1 and 2. The degree of change for all

participants in Group 3 worsened in the pre- to during-intervention period however, in the during- to post-intervention period, the degree of change was better or significantly better. The degree of change for participants in Group 4 tended to remain relatively stable.

Table 7

Difference between Pre-Intervention and Post-Intervention Scores and Reliable Change Index for ADHD Rating Scale-Parent Version

Participant	Total Score		Inattention		Hyperactivity-Impulsivity	
	Difference	RCI	Difference	RCI	Difference	RCI
1a	2.00	0.37	0.00	0.00	2.00	0.68
1b	19.00	3.48	9.00	2.67	10.00	3.40
1c	10.00	1.83	8.00	2.37	2.00	0.68
1d	19.50	3.57	6.00	1.78	13.50	4.59
2a	6.00	1.34	0.00	0.00	6.00	2.04
2b	30.00	5.49	16.00	4.75	14.00	4.76
2c	+10.00	+1.83	+8.00	+2.37	+2.00	+0.68
2d	1.00	0.18	0.50	0.15	0.50	0.17
3a	0.00	0.00	0.00	0.00	0.00	0.00
3b	10.00	2.24	6.00	2.03	4.00	1.67
3c	0.00	0.00	0.00	0.00	0.00	0.00
3d	+9.00	+1.65	+5.00	+1.48	+4.00	+1.36
4a	+1.00	+0.18	0.00	0.00	+1.00	+0.34
4b	4.00	0.73	5.00	1.48	+1.00	+0.34
4c	+8.00	+1.47	+5.00	+1.48	+3.00	+1.02
4d	0.50	0.09	+5.50	1.63	6.00	2.04

Note. + indicates score increased from pre- to post-intervention, i.e., level of ADHD from pre-intervention to post-intervention was more severe.

Table 8

Number of Participants Showing Various Degrees of Change between Pre and Post Measures on ADHD Rating Scale-Parent Version for Each Intervention Group (n)

Group	Significantly Worse	Worse	Same	Better	Significantly Better
Total score					
1				2	2
2		1		2	1
3		1	2		1
4		2		2	
Inattention					
1			1	1	2
2	1		1	1	1
3		1	2		1
4		1	1	2	
Hyperactivity-Impulsivity					
1				2	2
2		1		1	2
3		1	2	1	
4		3			1

Table 9

Difference between Pre-Intervention and Post-Intervention Scores and Reliable Change Index for ADHD Rating Scale-Teacher Version

Participant	Total Score		Inattention		Hyperactivity-Impulsivity	
	Difference	RCI	Difference	RCI	Difference	RCI
1a	26.50	4.06	17.00	4.74	9.50	2.47
1b	39.50	6.05	14.50	4.04	25.00	6.49
1c	9.00	1.37	8.00	2.23	1.00	0.26
1d	44.00	7.24	21.50	6.30	22.50	6.32
2a	+2.50	+0.38	+5.50	+1.53	3.00	0.78
2b	14.00	2.14	3.00	0.84	11.00	2.86
2c	4.00	0.61	+2.00	+0.56	6.00	1.56
2d	2.00	0.31	0.00	0.00	2.00	0.52
3a	8.00	1.23	10.00	2.79	+2.00	+0.52
3b	1.00	0.16	0.00	0.00	1.00	0.28
3c	13.00	2.14	7.00	2.05	6.00	1.69
3d	0.00	0.00	0.00	0.00	0.00	0.00
4a	10.00	1.53	2.50	0.69	7.50	1.95
4b	8.00	1.23	4.00	1.11	4.00	1.04
4c	+3.00	+0.46	+2.00	+0.56	+1.00	+0.26
4d	4.50	0.69	+0.50	+0.14	5.00	1.30

Note. + indicates score increased from pre- to post-intervention, i.e., the level of ADHD from pre- to post-intervention was more severe.

Table 10

Number of Participants Showing Various Degrees of Change between Pre and Post Measures on ADHD Rating Scale-Teacher Version for Each Intervention Group (n)

Group	Significantly Worse	Worse	Same	Better	Significantly Better
Total score					
1				1	3
2		1		2	1
3			1	2	1
4		1		3	
Inattention					
1					4
2		2	1	1	
3			2		2
4		2		2	
Hyperactivity-Impulsivity					
1				1	3
2				3	1
3		1	1	2	
4		1		3	

Predictive Variables

Pre-intervention measures. Several dependent variables were dichotomised and Chi-square tests were carried out on cross tabulations in order to address the final research question, i.e., what factors, such as IQ or socio-economic status, may influence the outcomes? The Fisher Exact two-tailed Test was used as recommended by Siegel and Castellan (1988, p.125) for small group numbers. Children were classified as “case” or “not case” based on meeting or not meeting diagnostic criteria

for ADHD as initially determined in the study. Marital status was dichotomised into living with partner versus living without partner. Socio-economic status (SES) was dichotomised into high (rating of 1, 2 or 3) versus low (rating of 4, 5 or 6). Children were categorised as having Oppositional Defiant Disorder (ODD) or not based on meeting diagnostic and other criteria for Oppositional Defiant Disorder as reported in the Method. The Child Behavior Checklist (CBCL), a general measure of behavioural problems, was dichotomised into high ($T\text{-score} \geq 70$) versus low ($T\text{-score} < 70$). The Parent Acceptance-Rejection Questionnaire-total (PARQ), a measure of parental warmth and acceptance, and Family Environment Scale-Relationship Index (FES), a measure of cohesion, expressiveness and control, were dichotomised into high versus low by taking scores above or below the mean for each measure.

Table 11
*Association between Independent Variables
and Post-Intervention Status*

Factor	df	χ^2	p
gender	1	0.79	0.55
marital status	1	0.04	1.00
SES	1	0.9	1.00
ODD	1	0.04	1.00
CBCL	1	0.25	1.00
PARQ	1	0.15	1.00
FES	1	0.91	0.62

Note. p reported for two-tailed test.

As shown in Table 11, the associations between several independent variables and post-intervention status are not significant, i.e., gender, marital status, socio-

economic status, co-existing Oppositional Defiant Disorder, severity of behavioural problems, level of parental warmth and family relationship were not predictive, at a statistically significant level, of post-intervention status. That is not to say however that these variables did not contribute anything to the process of change.

While factors such as SES, IQ and marital status were separately found not to be significantly associated with post-intervention status, across all participants, particular factors probably had an influence on outcomes for some individuals. Some families with low SES families had fewer resources, in terms of family and financial supports. IQ, whether high or low, presented particular challenges for some parents. Participant 3a, for example, was assessed as having a high IQ and a well-above average reading ability for his age. He required a lot of stimulation and extension of his skills. Not only did his parents have to manage his behavioural difficulties, but they also had to “cope” with a bright child. Participant 1d, on the other hand, required more input but because of his academic difficulties. These variables are only crudely represented by the dichomisation of factors and individual variation becomes lost in statistical analysis. Ethnicity was not entered as a factor in the analyses as this was difficult to dichotomise and the numbers in different groups, i.e., Maori and Asian, were small. These numbers were smaller than expected based on representation of these groups in the general population. Ethnicity did not appear to affect outcomes, however it was not possible to be certain that the content of the programme was equally appropriate for all the ethnic groups. It also is feasible that some potential participants may have felt uncomfortable with the protocol and may have selected themselves out of the research by declining to participate in the first place. One mother who identified herself as Maori and who was interested in participating indicated that she would only do so if there were other Maori mothers in

the group. The Asian family who participated in the study (Participant 1c) was the most concerned about the use of medication.

Post-intervention measures. Attendance of the parents at group meetings and evaluation of the programme, as well as evaluation of programme components, were dichotomised and Chi-square tests (Fisher Exact Test) were carried out on cross tabulations in order to test for a significant association between these factors and post-intervention status. Attendance of parents at group meetings and parental evaluation of the programme were dichotomised into high versus low by taking scores above or below the mean for each measure. Parental reports of liking medication and liking the parent programme were dichotomised in the same way.

Table 12

Association between Post-Intervention Measures and Post-Intervention Status

Factor	df	χ^2	<i>p</i>
attendance	1	1.17	0.36
evaluation	1	6.35	0.04
like medication	1	2.29	0.32
like parent group	1	0.25	1.00

Note. *p* reported for two-tailed test.

Table 12 shows that attendance at group meetings and parental report of liking medication or liking the groups are not significantly associated with outcome status. Evaluation of the programme, however, is significantly associated with outcome. Children whose parents rated the programme more positively were less likely than

children whose parents rated the programme less positively to still be classified a “case” at the end of the intervention.

Clinical Impressions

As has already been presented above, there is a general finding that participants in Group 1 had more positive outcomes than participants in the other intervention groups. It is clear however that there was considerable variation between participants irrespective of intervention group and that outcomes for some individuals were more positive than for others within the same intervention group. During the course of the study I became aware of a number of factors which, although not formally measured, may have been important sources of this variation.

The mother of Participant 1c was having ongoing custody/access disputes with her ex-partner. Four of the mothers had revealed a significant history of partner violence and abuse, Participants 1a, 1c, 3c, and 3d, and both parents of Participant 4c had a history of significant childhood abuse. All had received extensive counselling.

The parents of Participants 1a and 3d had older children who had serious behavioural, anger or emotional difficulties sufficiently problematic as to require therapeutic input. The parents of these children not only had to deal with the direct effects of the abuse that they had endured themselves, but they also had to deal with the possible adverse consequences of this abuse in at least one child in their family. Having other children with these kinds of problems generally seemed to make it more difficult for parents to cope, however one parent appeared to turn this to positive effect. The mother of Participant 1d had two older boys, both with significant behavioural problems. She was determined that she would not go through the same difficulties with her youngest son and was therefore very motivated to participate in all aspects of the programme. She also was very positive about this son, referring to

him as her “baby” or “special one” and was one of the few parents to exhibit approval during the compliance task behavioural observation. This mother used bedtime story reading as her “special play time” activity with her son and this added closeness and positive attention to their relationship with one another. In a similar way, the parents of Participant 4c were keen that their children should have good and happy lives, however given their own history of childhood abuse, they were isolated from their families and lacked any kind of social support. They had difficulties in their relationship with one another and were under pressure to cope with their son’s behavioural difficulties without assistance or relief. Many other families could rely on at least one other person such as a family member (e.g., grandparent) or friend to baby-sit or take the child during a weekend, but this was not possible for this family, thereby adding to their general level of stress.

The mothers of Participants 2c and 4a had difficulty accepting that their children had a diagnosis of ADHD or significant behavioural problems, even though they and the pre-school teachers had rated them as having these problems. The level and severity of ADHD behaviour as well as oppositional/defiant behaviour increased from pre- to post-intervention levels for Participant 2c, possibly because she became more “aware” of his behaviour. There was little or no change on the ADHD measures during the course of the intervention for Participant 4a, however the mother rated the level of her son’s oppositional/defiant behaviour as worse at post-intervention. Participant 4a generally tried to normalise her child’s behaviour and she was very positive about him, even when he engaged in inappropriate behaviour such as during the pre-intervention compliance task. She seemed to “feel guilty” or personally responsible that her son should have difficult behaviour. She had not told her husband that she and her son were participating in the study until well into the

intervention. She also did not tell any of her family or friends that her child was now on medication as she felt that they would be negative about this and give her a “hard time”. Participant 2c also did not tell family members or friends, apart from one sister, as she too felt that she would be unsupported in this decision for her child.

Some information was made available quite some time after the intervention about events which, at the time of the intervention, may have contributed to the outcomes. As one example, the father of Participant 2b worked at several jobs and was seldom at home. It also was reported from another member in Group 2 that he was heavily into drug-taking. The mother received little support from her husband. He had attended one of the follow-up groups in which we went over behavioural strategies and reported that he had no problem with his son and had control over his son's behaviour, “I don't have a problem with his behaviour but (mother) does”. For this mother, acknowledgement of her son's problems and support from other mothers may have been crucial elements in producing the reported positive outcomes.

As another example, a notification of possible abuse was made to care and protection services about the parents of Participant 2d. The teacher made the notification after bruising had been seen on the child and the father had been observed hitting the child on one occasion. Parental attribution of the problem or parental difficulty in dealing effectively with this child's' behaviour may have contributed to this situation. The level of parent acceptance declined from pre- to post-intervention. In addition, this child slept very little, sometimes only two to three hours a night and usually no more than five hours at a time. He usually would stay awake to wait up for his father returning home from night-shift work, which often would exasperate his mother. It is likely that this child was exhibiting a degree of

hyper-vigilance or hyper-arousal, contributing to his behavioural and attentional difficulties during the day.

Parental Evaluation of Programme

While participants and non-participants had to carry out numerous tasks as part of the assessment procedure, most parents were appreciative of having received a thorough assessment and generally accepted the outcomes, whether or not they received a medical diagnosis (e.g., a diagnosis of ADHD). Several mothers expressed great relief at finally receiving a diagnosis for their child, especially after having seen professionals previously about the same concerns. Many parents (but not all) expressed positive feelings about the programme, irrespective of the intervention they and their child received...“It made me see that there was light at the end of the tunnel.” (Participant 2c)...“This was an excellent programme, I wish I had done it years ago.” (Participant 2b).

When asked what they found the most helpful part of the programme (i.e., the intervention they received), parents' replies tended to centre on the child's behaviour and the support the parents received...“Discovering that there are other children out there with similar or worse problems.” (Participant 3b)...“Talking to other parents and realising I wasn't the only person with a child like this.” (Participant 2e, excluded)...“Talking about children's problems without getting any put downs.” (Participant 1a)...“Learning how to deal with the behaviour problems. Although they are not sorted out, I am practising what I have learnt” (Participant 3c). Several parents found “the whole thing” helpful.

Parents found group discussions, advice, help and information beneficial. Two parents reported that having their child take medication was the least desirable part of the programme (one child was on active medication and the other child was on

placebo). However another parent reported...“Nothing could be changed for me as I found it all helpful, medication completely changed her behaviour.” (Participant 1e, excluded). Two parents would have liked more one-to-one time between therapist, parent and child, while three parents would have liked more or longer sessions. Most parents reported that they liked the interaction with other families and mothers and meeting people in a similar situation...“I found coming here and talking to the other mums was really good. We have a special bond with one another which when you are down helps a lot. You had the time to listen no matter how much we or I blabbed on. Thank you. The support was nice after not having it for so long. Meeting and talking to other mums in the same situation...it was really great.” (Participant 3c).

Personal Evaluation of Programme

As discussed at the end of the Method, I had to run six intervention groups to get the final sample of participants. Included in these groups were parents and children whose data were not used in the final analysis (see Figure 2), but whose presence in the groups contributed to the outcomes and general “flavour” of the groups to some extent.

The first group (who received active medication/parent training) was generally well organised and most mothers made alternative arrangements for childcare. This gave them uninterrupted time to themselves and they could give attention to why they were there. The student assisting with this group noted that the mothers seemed very “needy”. They were very supportive and accepting of one another and, even though their life and current experiences were considerably varied, there were many similarities at different levels. For example, two mothers had a history of partner violence but one was now living with another partner and had several children while the other was single and had no other children. The group

helped to forge relationships between people. Two of the youngest mothers subsequently became friends and spent time together outside of the group. One of the mothers was Chinese and language differences sometimes made communication more difficult however this mother got on relatively well with other mothers who also were married with other children. This mother had been quite isolated and seldom ventured away from home because of her (perceived) difficulty speaking English; meeting other families and going out was helpful in reducing her social isolation.

This group included a parent whose child, it was later found, did not meet inclusion criteria for the study. The mother of this child had limited supports and had reported that she did not like her son. She recently had had a baby and it seemed that she had little time to attend to the needs of her older child. She had a childhood and adolescent history of violence and abuse which had not been addressed and her needs sometimes “took over” the focus of the group session. The mother of Participant 1a (who was in this first group) did not find the training aspects of this group particularly useful as she reported that she had tried many of the strategies or already was doing what was recommended.

The second group (who received placebo medication/parent training), unlike the first, was very disorganised with people arriving with their children at various times during the sessions, sometimes up to an hour late. As it turned out, none of the data collected from this group was admissible in the participant data analysis. As already discussed in the Method, one of the mothers knew that her child was receiving active medication and therefore data had to be withdrawn because the “blind” status was compromised. This child had met diagnostic criteria for ADHD. By the end of the intervention phase this child was no longer classified as a “case”. The level and severity of problems associated with ADHD and oppositional/defiant

behaviour were well within the normal range. The improvement was clinically significant (based on Reliable Change Index). The level of parental acceptance had increased from pre- to post-intervention and was the highest of all parents who completed this measure. This mother was very enthusiastic about the use of medication for her child as well as about the behavioural programme. She completed all the tasks in the programme and brought along the charts and activities that she had done with her daughter. Similar positive outcomes also were noted for Participant 1d (in first group) and Participant 2b (in third group). The mothers of these children had been through the “hospital system” when their children were younger. They had either been told that there was nothing significantly wrong or they received some advice but no follow up assistance. These mothers seemed to appreciate finally receiving a diagnosis for their child. They also seemed pleased that their child would receive help in the form of medication and that they would receive ongoing support and assistance in managing their child’s behaviour.

One of the mothers in this second group was currently in a physically violent relationship with her partner. It was later disclosed that he had physically abused their son some years ago and was jailed for this at the time. The presence of this father in the family and the ongoing abuse of the child’s mother are likely to have had adverse consequences for the child, which may have presented as behavioural problems. According to verbal reports by the mother, this child has continued to have worsening behavioural problems, however based both on her and grandparent ratings, the level of severity of these problems actually decreased from pre- to post-intervention levels. What did become worse were the level of parental acceptance and quality of family relationships. Nevertheless, this child is now on higher and more frequent doses of medication. To my knowledge, none of the family factors

have been adequately addressed and there are now two more children in the family. At the time of the group sessions, this mother was able to elicit some general support from the other mothers. She also appeared to be motivated to implement the behavioural strategies and practices in the programme but reported that these were not backed up by her partner. Two other mothers were experiencing separation from their partners at the time of the group sessions and appeared to require support and assistance regarding this issue more urgently than the issues specifically about their children.

Many of the children in this second group came along with their mothers to the Centre and were supervised by a graduate student. On these occasions, the children had an opportunity to play in a positive, safe and structured environment. Sometimes the children would run into the Centre calling our names in excitement and they appeared to develop a close bond with the student. I am not sure if these children knew why they were at the Centre but given their backgrounds the experience is likely to have been positive for them. The feedback from the student to the parents on how well behaved and happy the children were also was likely be positive for the parent and child; many of these parents don't typically hear or perceive positive things about their children.

In the third group (who received active medication/parent support), three of the mothers consistently turned up to meetings and they have kept up some contact with one another since the programme finished. The mothers in this group also were very supportive and accepting of one another. They spent most of their time talking about the difficulties that they had with their extended families, especially Participant 2a, and issues around medication. Several of the children came along with their mothers and, as with the last group, were supervised by a graduate student. These

children generally played well together. They had opportunities to learn appropriate behaviour from the student who would intervene when there were “fights” between the children or when they used inappropriate language. It also was helpful for the mothers to see how other children behaved in similar situations.

The fourth group (who received placebo medication/parent support) was small and sometimes only one or two mothers (out of three) attended the sessions. Two of the mothers had similar backgrounds and appeared to get on well with one another. As discussed earlier, the mother of Participant 4a (who was in this group) had not told anyone about her participation in the study and felt responsible for her child’s behavioural difficulties. Participant 4b (who was in this group) had a tendency to “pull her up” on this, which probably was quite useful in helping her accept the situation. Participant 4b was quite feisty and generally had no trouble speaking her mind. Over the course of group sessions, Participant 4a got used to standing up for herself and asserting what she felt and thought about things. Participant 4a tried to be positive about her child and generally tried to interpret behaviour and situations in a positive way. This could be seen as one of her strengths. It was helpful to her in difficult times and it was beneficial also for the other mothers to view a positive construction of children’s behaviour.

All parents in the fifth group (who received placebo medication/parent support) attended the group sessions consistently and there appeared to be a strong bond between the mothers. The two youngest mothers in this group have continued their friendship and see one another regularly. As has been discussed previously, the mother of Participant 3a (who was in this group) felt that there was little point in implementing the behavioural strategies until her son was receiving active medication. She would arrive at each session with a new set of problems or examples

of poor behaviour exhibited by her son since we had last met and would insist that these be addressed immediately. The other parents appeared to be very keen to work through the programme but this was made difficult by constant interruptions from the children they had brought along to the sessions and who from necessity were often left minimally supervised. They were asked eventually to try to make other child-care arrangements, which they did.

In all groups, it was noted that smacking was a pervasive technique used to “punish” their children. Most parents did not say that they used this technique as a favoured strategy, and they seemed not to even perceive it as a strategy, but it was mentioned in their conversations as a frequent and commonplace method of trying to “control” their child’s (mis)behaviour. More often than not, smacking was used as a last resort when nothing else would work, however it did not necessarily have the desired effect either. Even after completing the training programmes, parents still mentioned that they smacked their child, for extreme instances of non-compliance or defiance. Of the parents who received the parent training programme, nearly all reported that time-out procedures did not “work” and generally they did not use them. Some found these procedures unnecessary if they had successfully implemented the special playtime and reward strategies. It seemed however that most parents had difficulty finding time to “play” with their child each day for an uninterrupted amount of time (even 5 minutes) or in such a way as to have fun with their child rather than trying to control or teach their child.

From the parents who attended the final group (who received placebo medication/parent support), the data from only one mother/child (Participant 4d) were used in the analyses. One of those attending the group had been in a one-year relationship with the father of the child referred to the Centre. Both she and the father

initially attended sessions together, but after he got a fulltime job only she came along. She was upset when it was the last group session and reported that she was very appreciative of the support and help that she had received. The mother of Participant 4d reported that she did not find the group or parent training helpful as she had previous experience with agencies and she was more concerned about getting medical assistance for her son than “doing” a programme.

As indicated earlier, most of the children who came along to the sessions appeared to enjoy themselves and the overall experience is likely to have been positive for them. Even when children visit the Centre now, sometimes a year or more after they first came, they come running in calling out for me. Many of these children had a good time playing with the student and with the other children. They also appeared to enjoy the one-to-one attention during the assessment period both pre- and post-intervention. On the Continuous Performance Test, for example, many of the children did not complete or adequately perform the test. They left their seat and engaged in other activities during the task, or stayed seated but played with nearby toys or with the computer itself. Some children banged away on the keys in a furious and random way. Participants 1b and 3a even managed to turn it off and appeared to delight in doing so. Most of the children however did not have difficulty during the practice task which was relatively short and in which they received verbal praise for performing each action correctly. Problems started to occur for most children when they were left to perform the task with no further input; these problems were less evident in the children that I assessed at kindergarten, as part of the normative data collection. Most of the children seemed eager to please but at times had difficulty inhibiting their behaviour. This didn't make them any less likeable.

DISCUSSION

This study tried to determine the best ways of helping young children with ADHD and their families. I set out to evaluate the relative effectiveness of pharmacotherapy (stimulant medication) and behavioural intervention (parent training) and to examine several factors that might influence the outcomes. One of the advantages of being involved in all aspects of the study was that I had first hand knowledge and experience of what actually went on. During this process, I became aware of other factors, not formally measured, that seemed to have more relevance to the outcomes than either the type of treatment or the variables being measured.

That is not to say that the measures used in the present study were inadequate, as they did discriminate between groups of children, and the severity and nature of problems, as well as clearly relating to measures typically used in similar studies. Their ability to reflect the key aspects in the process of change and their applicability to a more dynamically oriented assessment and intervention procedure seemed to be somewhat limited. My observations indicate that there is a need to meld a simple experimental approach, in which one might be focused mainly on relations between certain variables, with a clinical orientation, in which one wants to find the best way in which to help people in need. These issues will be discussed later in this section. Before addressing the outcomes of the study, issues about the final sample and treatment integrity will be discussed, as they bear importantly on the interpretation of the findings.

Treatment Integrity Issues

In the present study, 26 children met ADHD and other inclusion criteria, however 6 could not be included for valid reasons (e.g., travel problems, illness,

assessments completed after final group allocated), and the data from 4 children subsequently were withdrawn because of inadequate treatment integrity. In my study, treatment integrity arguably was compromised by paediatricians being given information about medication status near the beginning of the study, even though they could not be sure from one group to the next of the exact medication status. Nevertheless, the likelihood that this could result in systematic bias is equivocal. For example, Towns, Singh, and Beale (1984) found that direct behavioural observations were not obviously biased by observers' knowledge of treatment conditions. No significant differences were detected in the reliability of behavioural observations made by informed and uninformed observers. It may be, therefore, that prior knowledge of medication status made little or no difference to outcomes in my study, even in those cases excluded because of parents' knowledge about the medication condition.

Some researchers have found or suggested that the combination of treatments is better than one treatment in isolation and that there is a need to satisfactorily address the effect of combined psychosocial and pharmacological interventions (e.g., Kolko et al., 1999; McBurnett et al., 1993; Pelham & Hinshaw, 1992; Pelham & Murphy, 1986; Swanson et al., 1993). There are however numerous problems that may be encountered in implementing multimodal treatments including expense, duration, complexity, difficulty in sustaining child and family participation in multiple interventions over time and the need for large samples to address all of the questions posed (Hechtman, 1993; Richters et al., 1995). In my study it was time-consuming to obtain satisfactory numbers of participants and to run intervention groups. From an initial pool of 93 children, only 16 children met eligibility criteria for and completed the study. What initially had seemed like a large number of young

children with ADHD, in reality turned out to be a large number of young children with various degrees of behavioural and/or developmental difficulties. The difficulty of obtaining a large sample of participants within a reasonable time frame also has been described by other researchers. Kolko et al. (1999), for example, ended up with a sample of 22 out of 70, further reduced to 16 because participants had adverse responses to medication, declined to take medication or were hospitalised.

In addition, very few published reports make reference to the clinical reality of conducting intervention studies or the environments in which they occur. Conners (1975) is one of the few researchers who actually described problems in assessing and treating young children. He suggested that the measures in his study generally were inappropriate for the young sample because, for example, more than half of the children refused to co-operate on a number of tasks that were reportedly difficult and tedious for them. He revealed that there were numerous deviations from the standard protocol because of difficulty testing this age group and it was suggested that the results were more variable and unpredictable than in similar treatment with older children. These sorts of “problems” and others such as recruitment and treatment compliance may be viewed as threats to treatment integrity, and in research studies generally are controlled for or data are not included in the analysis. These realities are however typical in clinical work. It seems important for us to consider more carefully the likely generalisability of reported research outcomes, as well as the focus of clinical research. Often it is these factors that account for the large variability in individual outcomes.

Participant Sample

The final sample of 16 children and their parents represented 17% of the initial pool of potential participants. Of those that could be contacted, 18 parents

declined to participate, most giving the reason that they did not want medication for their child. The families who proceeded with the assessment and participated in the study presumably were more disposed toward medication as a treatment option. This might signify a change in public attitudes to medication as an option or perhaps indicate that parents referred to a tertiary level health centre are in great need of whatever assistance they can get for their child and themselves. While stimulant medication has been used as a treatment for ADHD in New Zealand, its use has been limited until recent years. The use of stimulant medication has become more prolific recently, as indicated by the figures supplied by Pharmac on prescribing trends for the years from 1993 to 1997. This is likely to reflect a change in prescribing regulations and better acceptance by New Zealanders for this type of treatment, as well as more public awareness of ADHD.

Situational problems. Of the children who were assessed but did not meet inclusion criteria, a significant number (15) were classified as having “situational” ADHD, based almost entirely on parent ratings (14/15). This finding is consistent with other research specifically examining the relationship between situational and pervasive hyperactivity. Tripp and Luk (1997), for example, found that the severity of behaviour problems in children classified as having situational hyperactivity was clear from the parent reports and that these reports could not be distinguished from those on children classified as having pervasive hyperactivity. In contrast, they found that the teacher ratings for the situational group were significantly lower. In the study by Tripp and Luk (1997), the situational group consisted of 15 children, 11 of whom had been identified by their parents as having significant problems.

In the present study, the 15 children were significantly younger than the final participant sample and perhaps they had not yet had the opportunity to demonstrate

ADHD behaviours in multiple settings. Alternatively, they simply could have been children whose main problem was a relationship difficulty with their parents. My impression of most of these parents (primarily mothers) was that they were engaged in what Buss (1981) would call power struggles and competition with their children. They seemed to be harsh in their interactions with their child and had very little to say that was positive about the child, except for comments such as the child was doing well academically. Many of the children tended to be responding to significant events in their environment, reflecting the situational nature of their problematic behaviour. These events included marital separation or discord, history of abuse by father, poor living conditions, and maternal depression. Another factor that appeared to exacerbate the child's behaviour was inconsistency of parental management, which contributed to marital problems for some parents. These impressions are important with regard to establishing treatment plans. Adjusting the setting events or helping to change family circumstances, for example, might result in improvements in child behaviour. Many of these parents, however, were very resistant to changing their own behaviour and seemed to prefer to view the nature of the problem as residing within the child. Several of these children did go on to receive medication from the paediatricians which, to some extent, seemed to reinforce this view.

Assessment issues. All children contacted for this study had originally been referred with attentional and/or hyperactivity problems but clearly not all children met diagnostic criteria for ADHD, indicating that a thorough assessment is important. As mentioned above, 15 children had significant problems associated with ADHD in only one setting, 5 children had no significant or specific problems, 6 children no longer required assistance because their problems had improved, and 8 children had other significant developmental problems. If the present study had not been

conducted, the paediatrician typically would have seen these children. It is quite likely that a large majority of these children would have received medication to “treat” the presenting behavioural problems. This conclusion is based not only on my own observations of treatment practices at the Centre, but also on reviews of stimulant medication prescriptions and figures supplied by Pharmac which indicate an increasing prevalence of this type of intervention in New Zealand (e.g., Matheson, 1996). There also is research which has found that most children who present with problems of high activity levels and difficulty sustaining attention and are seen by paediatricians will be treated with stimulant medication at some point (Bosco & Robin, 1980; Pelham & Murphy, 1986).

Nature of behavioural problems. Of the children who met criteria for ADHD in the present study, more than half were rated as predominantly hyperactive-impulsive type (9 children plus all 4 whose data were excluded). These children were notably “on the go”, often running wildly about the Centre, in and out of rooms, the elevator and even the building. They tended to fall over or crash into things in their haste to move from one thing to another. It was difficult to get most of them to stop and stay still long enough to give them instructions or for them to complete tasks. These children presented as different from those who met diagnostic criteria for ADHD inattention-type. Those children were less of a challenge to supervise and generally were quieter and often appeared to be “in a world of their own”.

Five children plus one from the group not included for analysis also met diagnostic criteria for Oppositional Defiant Disorder, however outcomes for these children were not necessarily worse than for those with ADHD alone, contrary to what has been suggested in some of the literature. This finding is nevertheless consistent with the recent work by Musten et al. (1997) who found no evidence that

also having a diagnosis of Oppositional Defiant Disorder predisposed children to worse outcomes. Based on my observations of, and interactions with these children, they appeared to be less eager to please and their actions, such as non-compliance to instructions, were more purposeful. Participant 3a, for example, seemed pleased to show me the hammer that he had used to smash a light switch and then explain what he had done. The children without ODD also would engage in non-compliant or defiant behaviours but the quality or functional aspect of these behaviours was different. These behaviours seemed to occur, for example, because the child had to stop responding impulsively and missed out on some instant gratification, or the child had to stop “day-dreaming” and focus on a task.

Demographic and family variables. Most children in my study (11/16) lived in two-parent families, however fathers typically were less involved than mothers in the assessment and intervention process. Mothers usually spent a lot of time with their children, with only two mothers having work outside of the home and one mother attending university. Prior, Leonard, and Wood (1983) found that more mothers in their research sample were home full-time, relative to the general population of mothers of pre-schoolers in Australia, and consequently they were more likely to have time to participate in research. There were no significant differences between the intervention groups in terms of socio-economic status, however the percentage of individuals within each of the six socio-economic status groupings differed from the general population. Seventy-five percent fell within the lower range compared with nearly 57% for the general New Zealand population. While socio-economic status was not significantly associated with outcome, it is possible that generalisability of findings from this sample may be limited by this factor. Similarly, major ethnic groups, such as Maori, Pacific Islander and Asian groups, were

underrepresented in the participant sample. In terms of initial problems or outcomes, the non-European families who participated in the study did not appear to be different from others, perhaps because they were amenable to participate in the programme. Many more Maori families were seen for assessments, however they did not participate in the study because the child had other developmental problems, there was no specific problem or the problems had improved. These families appeared to be keen to obtain help for their child. Socio-economic factors appeared to be more important than ethnicity as factors in participation and perhaps treatment outcome. For some low-income families, for example, it was difficult to travel to and from the Centre and life, in general, for many of these families appeared to be difficult and not very rewarding.

Although not formally assessed, some parents reported a history of partner abuse. Moffitt and Caspi (1998) suggested that the strongest developmental risk factor for adult partner violence is childhood conduct problems and that young children are adversely affected by witnessing adult violence in their homes. They hypothesised that partner violence may result in childhood behavioural problems by disrupting the quality of parenting, by threatening children's safety or by children imitating this type of behaviour. It is possible that such a history for some parents may have had an adverse effect on some aspects of the intervention process and may account, in part, for the variability between individual outcomes. For example, in Group 1, the mothers of Participants 1a and 1c, but not Participants 1b and 1d, reported histories of partner abuse. It was found that parent and teacher behavioural ratings for Participants 1b and 1d improved significantly, to the point of these two children no longer meeting diagnostic criteria for ADHD. Participants 1a and 1c continued to have behavioural difficulties. From what the mothers described, they

had experienced significant levels of physical abuse and one can surmise that they would need a lot of emotional support to get over the effects of the abuse. To also have to cope with a child with behavioural problems might have seemed like another hurdle to overcome, resulting in some indifference to suggestions or strategies to help manage the child's behaviour. Some of these mothers often appeared very reasonable with their child in the face of unreasonable behaviour, perhaps inadvertently reinforcing such behaviour.

Child cognitive factors. As discussed in the Introduction, it has been suggested that ADHD has an association with lowered IQ, particularly verbal IQ. In my study, the children's Verbal IQ was statistically significantly lower than their Performance IQ (although not clinically significant based on test criteria). This difference is consistent with the tendency for children to score lower on verbal intelligence, executive functioning, and attention modulation, often taken as evidence supporting the perspective that structural deficits in the brain account for the behaviour of children with ADHD (see Hirschi & Hindelang, 1977; McGee et al., 1991; Moffitt, 1990, 1993).

The children participating in the present study also made more errors of omission (i.e., missed more target stimuli over the course of the test) on the Conners' Kiddy Continuous Performance Test than a community sample of kindergarten-aged children, even when taking into account that the participants were significantly older than the kindergarten sample. There was, however, no significant difference between the groups in their occurrence of commission errors (i.e., the number of responses to non-targets). This finding is somewhat contrary to previous work, which itself is equivocal. For example, in a meta-analysis of 26 studies with children aged 6 to 12 years, Losier et al. (1996) found that children with ADHD made more errors of both

omissions and commissions than did control children. Kerns and Rondeau (1998) found that commission errors were more prevalent in the performance of young children. Byrne et al. (1998) also found that a sample of pre-school children referred for ADHD made significantly more commission errors on a cancellation task than did matched controls but did not make more omission errors. Byrne et al. (1998) suggested that this indicated that children with ADHD might exhibit primarily a pattern of difficulty inhibiting behaviour and thereby respond impulsively. While the version of the Continuous Performance Test used in the present study has not been standardised, it is based on similar tests that have been normed and therefore its use has some validity. In observing children performing this task, it seems, to some extent, that they lose the “thread” of the task and see something more interesting that they would prefer to engage in, returning to the task now and again. Other children banged away on the keys seemingly in an effort to comply with the instructions, they were told to press the spacebar but clearly had not attended to all of the instructions or aspects of the task. These children did not, as Byrne et al (1998) suggest, respond impulsively because they had difficulty inhibiting their behaviour, but seemed to have difficulty inhibiting their behaviour because they could not attend to the task or instructions. The difference in some children at post-intervention, such as Participants 1b and 1d, was notable in that they appeared eager to please, smiling at me and their mothers, in contrast to their demeanour in the first session, and they concentrated almost solely on the task which consequently was reflected in their improved test performance.

Summary. In conclusion, the participant sample probably is fairly representative of clinic-referred New Zealand young children with ADHD. The results can reasonably be compared to samples used in other research where care was

taken to ensure that diagnostic criteria were met. Treatment integrity was adequate to address the research questions in the present study.

Question 1: Is the Combination of Parent Training and Stimulant Treatment Better than either Treatment Alone?

In order to address this first question, I looked for evidence of significant interactions between Intervention Group and Intervention Phase. Based on these interactions and notwithstanding the limitations due to sample size, the combination of treatments was better than either treatment alone. There were significant improvements in teacher ratings of children's behaviour and a comparable, although generally nonsignificant, improvement in parent ratings. In the present study, all correlations between parent and teacher ratings were not found to be statistically significant. Parents generally were more negative than teachers in their ratings of children.

The difference between the ratings of parents and teachers is similar to the findings of another combined treatment study. Gittelman et al. (1980) reported that while parent ratings indicated that all treatments (i.e., methylphenidate-alone, behaviour therapy plus placebo medication or behaviour therapy plus methylphenidate) were equally effective, teacher and psychiatrist ratings indicated that the combined intervention was more effective. A discrepancy between parent and teacher ratings also was demonstrated in a study evaluating the effectiveness of a parent training programme. Strayhorn and Weidman (1991) found that there was no difference between treatment and control groups on parent ratings and child achievement test scores, but teachers rated children in the treatment group as improved on attentional and activity problems. In the present study, teachers were less involved than were parents and they only knew about the study from what

parents might have told them. Most were not involved in the intervention process apart from one or two teachers having to administer the lunchtime dose of medication. Teachers therefore might be considered to be more reliable or objective than parents in their observations and ratings of the children's behaviour, at least in the sense that they typically had less stake in the outcome.

Although the overall finding indicates that the combination of active treatments is better than either treatment alone, inspection of outcomes on the individual measures shows positive change and support for this finding on some measures but not on others. Individual variation also occurs both across and within groups.

Changes in child behaviour. Based on teacher ratings, there was a clear indication that the combination of active medication and parent training was significantly more effective in improving behaviour problems than the other combinations. Overall, Group 1 had significantly lower levels and severity of hyperactivity, impulsivity and inattention at post-intervention, compared with the other groups. Based on parent ratings on the ADHD Rating Scale, there was a very clear trend for Group 1 (active medication/parent training) and Group 2 (active medication/support group) to show improvements from pre- to during-intervention in hyperactive, inattentive and impulsive behaviours. This trend did not continue through to post-intervention for Group 2, however Group 1 continued to show a modest level of improvement. In general, there was little change over intervention phases (pre/during/post) for Groups 3 (placebo medication/parent training) and 4 (placebo medication/support group). Group 3 initially worsened and then improved to return pre-intervention levels on the above measures.

Parents in Group 3 may have been less inclined (i.e., not rewarded in their efforts) to work actively in the behavioural intervention if they perceived that the medication (i.e., placebo in this case) was not helping the child, possibly resulting in a decrease of positive treatment expectations over time. A view expressed by one of the mothers in Group 3 was that there was little value in implementing behavioural strategies when the medication was not “working”. It has been suggested that the short-term efficacy of methylphenidate in terms of enhancing mother-child interactions may increase the probability that parents will be more successful in the use of behavioural techniques. This success might therefore minimise parent discouragement and subsequent failure to continue with behavioural interventions (Ialongo et al., 1993). This effect seems to occur when one compares the overall positive outcomes for Group 1 (active medication/parent training) with Group 3 (placebo medication/parent training). For some parents though, medication and support were enough to elicit positive changes in behaviour and interactions (e.g., Participant 2b) and, for others, parent training without active medication was sufficient (e.g., Participant 3b). It also has been suggested that parents who have fewer resources to bring to bear on the child’s difficulties do less well in parent training programmes (Fallone, 1998). Factors such as limited social and family support or history of abuse appear to make it more difficult for some parents to manage with the demands of a structured and standard parent training programme.

Previous research also has suggested that parent and teacher ratings of the use of medication to treat ADHD are quite favourable because drug effects and the evaluation process are relatively quick and treatment requires minimum effort on the part of parents and teachers (e.g., Johnston & Fine, 1993; Liu et al., 1991). Clearly a behavioural intervention such as the one in my study requires extensive input from

parents not just in attending the programme but also in actually carrying out the procedures within it.

Although not statistically significant, parent ratings indicated a decrease in the number of oppositional and defiant behaviours exhibited by children on medication (in Groups 1 and 2) to within the non-problematic range, even though the initial level was relatively low for those in Group 2. There was a clear and significant decrease in teacher ratings of child oppositional and defiant behaviours, particularly for those in Group 1, however the overall level of problems at pre-intervention for Groups 1, 2 and 4 was already within the “normal” range.

Changes in child cognitive ability. In my study, it was shown that children receiving active medication had significantly lower omission scores (i.e., they missed fewer targets) at post-intervention than they did at pre-intervention on the Continuous Performance Test. This improvement in performance occurred only if their parents had received parent training. Although the magnitude of this effect was small, it appears that the children’s performance was enhanced to some degree by receiving the combination of active medication and other input helping them learn the skills necessary for the task. While there was significant variability in the level of performance at pre-intervention across groups on the Conners’ Kiddy Continuous Performance Test, examination of individual data indicated that the performance of all children in Group 1 improved from pre- to post-intervention.

The high degree of individual variability makes it difficult to interpret the data from this task. Aside from intervention effects, the presence of another adult in the room had an effect, positive or negative, on children’s performance. For some children, performance also was affected by what had occurred shortly before entering the room. As reported in the Results, many of the children also did not complete or

adequately perform the Continuous Performance Test. They left their seat and engaged in other activities during the task, or stayed seated but played with nearby toys or with the computer itself. Some children banged away on the keys in a furious and random way. Participants 1b and 3a even managed to turn it off and appeared to delight in doing so. Not only did the children have difficulty inhibiting their behaviour but they also had a problem maintaining attention to task. Most of the children however did not have difficulty during the practice sessions when they were supervised or given verbal praise for carrying out the instructions correctly, however when this feedback ceased, performance of most children deteriorated.

Another difficulty interpreting data from this test and comparing studies, including the present study, is that there is considerable difference between the versions of the Continuous Performance Test. As mentioned in the Introduction, outcome measures for behavioural interventions usually do not include performance on cognitive tasks such as the Continuous Performance Test, however it is frequently used in many studies comparing ADHD children with non-ADHD children and for evaluating the effectiveness of medication (Bergman, Winters, & Cornblatt, 1991). Methylphenidate has been found to decrease omission and commission errors to various degrees on cognitive tasks such as the Continuous Performance Test and this has been taken to indicate improved ability to sustain attention and inhibit behaviour (e.g., Byrne, DeWolfe, & Bawden, 1998; Musten et al., 1997).

Children's behaviour on this task in the present study was similar to that reported in some other studies, which found that children's verbal behaviour did not always match their physical behaviour. Kerns and Rondeau (1998) found that children would tell the examiner that they were only supposed to "click for the sheep" (i.e., the target in their study), while at the same time were "clicking" to a non-target

stimulus. Kerns and Rondeau (1998) reported that while children seemed to “know” what they were supposed to do, they were unable to inhibit their responding. These researchers viewed such behaviour as indicative of poor impulse control. As discussed earlier, children seem to have difficulty maintaining their attention to task and engaging appropriately in verbal instructional or rule-governed behaviour, thereby resulting in impulsive behaviour.

Changes in parental acceptance and family relationships. There was no specific evidence that the combination of treatments was more effective than either treatment alone in improving the level of parental acceptance or family relationships. There was however a clear, although not statistically significant, tendency for the level of parental acceptance to improve more for those in Group 1 compared to the other groups. The quality of family relationship significantly improved, albeit moderately, for all groups from pre- to post-intervention. This change is seen as an example of the general positive influence of participating in the study, as opposed to the more specific effects of particular treatment components. It is likely that for all participants the process of assessment, assistance and support from others resulted in some general positive outcomes.

Changes in parent-child interactions during compliance and attention tasks. There were no significant Intervention Group x Intervention Phase interactions on the compliance task measures. As with the outcomes reported on some of the previous measures, the combination of treatments did not produce larger changes than either treatment alone. For all groups, the number of repeat commands issued by the mothers significantly decreased from pre- to post-intervention and the level of child compliance significantly increased. Unlike the other parents, the number of repeat commands increased for Participants 1c and 2b and the level of child compliance

decreased from pre- to post-intervention. The direction of this association is not clear, i.e., it might be that if parents decrease their instructions, or repetitions of them, children are more likely to comply, or if the child complies, parents no longer need or feel compelled to repeat the instructions.

During the attention task, there was substantial variation in performance largely due to no or very low occurrence of behaviour for some participants in each group. For the total sample, the percentage of fidgeting significantly decreased from pre- to post-intervention. This measure was unaffected by treatment conditions and clinical observation suggested that most children appeared to enjoy positive attention and individual time with their parent.

Studies using parent training interventions have found increases in percentage of child compliance, as well as increases in the use of appropriate commands by parents. Parents also give more positive feedback and consistent reinforcement of compliance and fewer directive statements (Pisterman et al., 1989; Pisterman et al., 1992). These studies however did not find generalisation of treatment effects to behaviour that was not targeted in the treatment and no evidence of treatment effects on measures of attention. It seems that parents can become very adept at carrying out techniques, without necessarily having or needing an understanding of their broader application, or about behaviour and relationships in general. Other research has found positive medication effects on interactions between mothers and children, in which children decrease off task and non-compliant behaviour and increase rates of compliance as well as the length of sustained compliance with maternal commands and mothers decrease their commands and disapproval and increase their responsiveness and positive attention (e.g., Barkley, 1988; Barkley & Cunningham, 1979, 1980; Barkley et al., 1984; Humphries et al., 1978). In contrast, however,

Musten et al. (1997) found that methylphenidate had no effect in changing the level of children's compliance with parental requests. They suggested that the potential beneficial effects of the medication might not have been attained because the doses were too low or that medication alone was not sufficient to address the parent and/or child behaviours that contribute to compliance.

Of interest regarding the observational tasks in the present study was that the overall rates of child and parent negative behaviour and the number of parent approvals were very low. Although children did not always comply with commands, they were not necessarily negative in their interactions with their mothers. Mothers also did not exhibit any specific, overt negative interactions, even though they had reported themselves to do this occasionally. In contrast, Barkley et al. (1984) found that even when children with "hyperactivity" comply with the commands, mothers of younger children are more likely to respond to this compliance with further commands and negative behaviour, as compared to the reactions of mothers to older children. Interestingly, other research has indicated that mothers of "problem" boys are significantly more negative and controlling in their interactions than mothers of comparison boys, despite the fact that the boys themselves are no less compliant (e.g., Campbell et al., 1991; Campbell, Pierce, March, Ewing, & Szumowski, 1994).

Pollard et al. (1983) found that both parent training and methylphenidate treatments decreased the number of commands given by the mothers, whereas only the parent training significantly increased the amount of positive attention given to the children. This was not the case in the present study. Of concern here was that most mothers did not reinforce positive, compliant behaviour in their children, possibly diminishing the likelihood of this behaviour in the future. This was typical of mother and child interactions in all groups, both pre- and post-intervention. It

seemed to me that the mothers had an expectation that their child “should” be able to behave appropriately like other children and that such behaviour was a “given”, rather than something that needed to be learned or rewarded by the parent.

Parental evaluation of programme. Attendance at group sessions was not significantly different across the groups and more than half of the parents (9/16) attended all sessions. This seemed to indicate that parents were generally very keen to get help for their child and valued the opportunity to gain support for themselves and discussion on personal topics such as health, relationships and family. Prinz and Miller (1994) improved drop-out rates during a parent training course for parents of children with antisocial problems by providing the parents with opportunities to discuss personal issues, feelings about being in therapy, and family disputes.

Overall, there were no significant differences between the groups in their general evaluation of the programme, how much they liked the parent group, liked the sessions, or liked medication for their child. In contrast to this finding, Cohen et al. (1981) found that more parents of children receiving methylphenidate were satisfied with treatment (78%) compared to children receiving only the behavioural component (50%), even though most (75%) rated their children as improved irrespective of which type of treatment (or not treatment) that the child received. In their study however, it was the children rather than the parents who received the intervention (i.e., pharmacotherapy and/or behavioural programme).

Medication and parent training were viewed as generally acceptable modes of intervention by most parents in the present study. Parents in Group 2 (active medication/support group), compared to parents in the other groups, liked medication the most and they also liked the parent programme they received the most. Parents in Group 3 (placebo medication/parent training) liked medication the least whereas

parents in Group 4 (placebo medication/support group) liked the parent programme the least. A couple of parents indicated that the worst part of the study was that their child had to take medication. For example, the parents of Participant 1b were very reluctant for their child to have medication but gave it to him anyway as part of the programme. As it turned out, the combination of active medication together with the training programme resulted in very positive changes in this child's behaviour. The other parents appeared to be desperate for their child to have medication, as they perceived this to be the most efficacious treatment. While concern over the use of stimulant medication has been raised in New Zealand (e.g., Matheson, 1996), it seems that it is becoming a more favourable treatment option than it might have been in the past. One parent, Participant 1d, made it clear from the start, "I don't know what I'll do if he doesn't get the active stuff", perhaps implying that they might have to withdraw from the study. No parent ever expressed any concern that the type of parent programme they were receiving was or was not appropriate for their child; most expected medication, rather than the implementation of behavioural strategies or a change in the parent's behaviour, to affect their child's behaviour.

General conclusions. Across behavioural, cognitive and observational domains, there was an overall finding that the combined intervention produced more positive changes. As presented above, some positive outcomes were found for the total sample in my study, irrespective of which intervention condition they received. This might reflect general placebo or expectancy effects and/or non-specific treatment effects. While placebos are usually defined in terms of what they are not, and are often described as "inactive", they can exert influence and be quite effective in eliciting beneficial responses (Brown, 1998). According to Brown (1998), participants (in pharmacological studies) benefit from a thorough medical evaluation,

a chance to discuss their condition, and from receiving a diagnosis and a plausible treatment plan. They also may receive enthusiasm, effort and commitment of staff; in the present study an example would be my generally positive and close relationship with the parents and children. In some respects, the clinical aspects of the study were less demanding than those encountered in my work position at the Centre. This was primarily because there were none of the usual pressures or constraints often found in similar settings, such as having wait-lists or considering cost-effectiveness factors and having to limit time spent on assessments or interventions. These factors may account for some of the findings in which there was improvement for the total sample, irrespective of treatment condition. Similarly, Schleifer et al. (1975) concluded that methylphenidate was less efficacious for young children than for school-aged children and that significant improvements occurred as much as a function of time as of drug treatment. They suggested that this might be due to the high quality nursery care for the children, weekly group meetings with other mothers and interviews with a psychiatrist. Schleifer et al. (1975) also suggested that mothers might have perceived their children to be less hyperactive and less aggressive just because they tended to have high expectations that the drug would help their child, as has been discussed previously in this section.

Erhardt and Baker (1990) suggested that in contrast to improvements seen in more specific behaviour problems targeted by parents, chronic and pervasive problems appear less likely to be ameliorated by the type of brief training programme used in their study. Although this conclusion was based on the results from only two participants and their families, this and the other conflicting results bear testimony to the complexity of interventions for young children with ADHD and their families. Although these interventions are useful for some children under some circumstances,

they clearly do not result in positive outcomes for all children under all circumstances.

Question2: Is either Comprehensive Behavioural Intervention or Pharmacotherapy More Effective than the Other?

To be able to answer this research question affirmatively, I needed to find a significant degree of change between outcomes on methylphenidate and parent training at post-intervention but not at pre-intervention. This specific finding was not obtained on post hoc comparisons for any of the dependent variables. Analyses of treatment effects were performed in a hierarchical fashion to minimise both Type II and Type I errors. While the research design was helpful in reducing the possibility of Type I errors, the limited number of participants and consequently less power to detect small effects increases the likelihood of Type II errors. The finding of a nonsignificant effect does not necessarily indicate that there was no effect but rather that the magnitude of the effect, if present, was too small to be detected in my study because statistical power was insufficient. Therefore, this does not mean that the two treatment components were necessarily of equal effectiveness but only that the proposition that they were equivalent could not be refuted.

There are some significant findings that do bear to some extent on the research question. Depending on which measure was examined and who completed the rating scales, two-way interactions between one or another treatment component and Intervention Phase indicated significant treatment gains; one treatment component often would produce a significant treatment outcome when the other did not. In general, positive medication effects were found on parent ratings whereas positive parent training effects were found on teacher ratings.

Many studies have evaluated the effectiveness of one treatment component and compared this to a relevant placebo treatment, or in the case of medication, with another dose level, but not usually with each other. On the basis of typically positive outcomes for the active treatment (medication or behavioural intervention), conclusions are drawn that this is a beneficial treatment for ADHD. However, in the case of medication, the likelihood of seeing positive or negative changes is increased by the fast-acting nature of the drug. Children, parents, teachers or physicians may be actively “looking for” or expecting such changes in behaviour and performance. Similarly, during behavioural training, children, parents or teachers spend time learning new skills, and outcomes are usually compared to pre-treatment status, rather than against a comparable placebo condition, or sometimes to medication. But positive expectations or outcomes might be predicted simply from the amount of effort expended (c.f. cognitive dissonance theory; Festinger, 1957). Support groups in general have been found to help parents cope with their children’s problems (e.g., Koroloff & Friesen, 1991). It is not clear in the present study whether the support group was nothing more than a placebo for parent training. The process was certainly different; parents in the support group did not ask questions or seek advice about their child’s specific behavioural problems but instead tended to focus on medication issues and issues relating to their general situation, such as relationship or money difficulties.

Question 3: To what Extent is Behaviour Normalised by Treatment?

Irrespective of intervention condition, 7 of the 16 children no longer met diagnostic criteria for ADHD at the end of the study and there was no clear relationship to Intervention Group (two children were from Group 1, three from Group 2 and one each from Groups 3 and 4). Children who received active

medication, however, were more likely than the others to no longer meet diagnostic criteria for ADHD at the end of the study. Of the four children who met criteria for ADHD combined-type pre-intervention, two no longer met diagnostic criteria for any type of ADHD at post-intervention. In addition, 2 of 5 children who had initially met criteria for Oppositional Defiant Disorder no longer did so following intervention; one child was from Group 1 and one child was from Group 3.

Other studies referred to in the Introduction, that have evaluated the effectiveness of treatments for children with ADHD, typically do not use change in diagnostic criteria as a measure of success or positive outcome, as described above. Measures of clinical change previously have been used and also were employed in the present study to examine normalisation of behaviour following treatment. The general trend is that the greatest degree of positive, clinically significant change (as rated by both parents and teachers) was exhibited by participants in Group 1 compared to participants in the other groups. Based on parent ratings of hyperactivity, impulsivity and inattention behaviours, 10 children were rated as being better or significantly better, compared to pre-intervention status. Teachers were even more positive in their reports, rating 13 children as being better or significantly better at post-intervention. Although the level of change for children in Groups 1 and 2 was greater than the level for participants in the other groups, these findings also indicate that the general assessment and intervention process can effect positive changes.

At the end of the study, all children and parents had a follow up appointment with the paediatrician. Of the 7 children who no longer met diagnostic criteria for ADHD, 6 continued to receive medication. Of these 6 children, 3 have since stopped taking medication but the others had the dose and/or frequency increased. The

parents of the one child who no longer had ADHD and who did not continue to receive medication had never been comfortable with their son having medication (i.e., Participant 1b). They did report however that they felt it was the combination of the medication and the parent training that had helped their son's behaviour improve and they were very pleased with the outcome. Of the other children who still met diagnostic criteria at the end of the study, most continued to receive methylphenidate and most had the dose and frequency increased or received an additional medication. The only follow up that these children and families have received after the study is with the paediatrician and therefore it is not surprising that medication is the treatment of choice.

Question 4: What Factors may Influence the Outcomes?

In the present study, the associations between several quantifiable, independent variables and post-intervention status were not significant. Specifically, gender, marital status, socio-economic status, co-existing Oppositional Defiant Disorder, severity of behavioural problems, level of parental warmth and quality of family relationship were not predictive of post-intervention status. While recognising the limitations of small participant numbers and consequent limited power to detect small effects in my study, these findings are nevertheless consistent with previous research which has suggested that short-term positive change cannot be predicted by previous physiological or psychological profiles (Swanson et al., 1993).

Several other factors, such as attendance at group meetings and parental report of liking medication or liking the groups, also were not significantly associated with outcome status. Overall evaluation of the programme, however, was significantly associated with outcome. Children whose parents rated the programme more positively were less likely than children whose parents rated the programme more

negatively to still be classified a “case” at the end of the intervention. Presumably, this would not be an unlikely finding, but the direction of these associations is not clear. For example, did liking the programme prompt a change in behaviour, or did a change in behaviour result in liking the programme? Most parents in all groups found group discussions, advice, help and information beneficial and most of them reported that they liked the contact with other families and mothers and meeting people in a similar situation.

My presence itself may well have contributed to the outcomes, however it is difficult to know the nature of this effect. Even though parents evaluated me positively (as the therapist), the validity of their evaluation may be questioned, given that I was the person reading the evaluations. Nevertheless, one of the advantages of having been the person who conducted the assessments and who also ran the interventions was that I was able to build up a picture of several factors that might have an influence on the outcomes, based on general observations and impressions. These factors include idiographic variables such as parent determination for change, lack of history of partner or childhood abuse, increased social interaction or support from attending a group, and parental observation of other children with ADHD resulting in more acceptance of their own child’s behaviour. As will be discussed, it is perhaps these factors or their contribution to the intervention process that is more important in effecting changes than the technical components of the treatment itself.

Theoretical Considerations

Theory versus practice. Overall, at least in the short term, combined active interventions produced the largest reduction of child behaviour problems. There also were some pre- to post-intervention changes for the total sample which are likely to be due to “non-specific” effects such as thorough assessment, diagnosis, and so on, as

previously discussed. Notably, these general findings emerged from a background of wide variation in the response of individuals to the different treatment conditions. So how is one to view the outcomes in this study?

Evans (in press) suggests that we usually think of advances in clinical practice as coming directly from empirical data, such as treatment outcome studies. He argued however that “empirical studies validate theory, not technique, and that the actual practices implemented by child clinicians are best derived from theory, not the research” (p. 15). Suppose we initially consider the implication of the first part of this proposition by referring to the relationship between treatment techniques and outcomes in my study. We would view clinical research in the traditional way by saying, “here is a diagnosis and here is the preferred treatment option”. The findings of the present study would be framed or interpreted in terms of, “here are these young children with a diagnosis of ADHD and here is the best or preferred treatment, which is a combination of medication and parent training”. I will return to a more general consideration of Evans’ proposition, but first will make some other relevant observations.

Service versus intervention. Adelman (1995) has discussed the movement in the United States toward School-Based Health Centers. Most of the students came for help with non-medical problems (e.g., relationship difficulties) and this was addressed by hiring a part-time mental health professional who offered individual or group psychological intervention and referrals. Further monitoring showed that it did not take long for those involved with the Centers to realise that most students did not receive the type of help that they required. The clinical approach proved to be a weak intervention model because it was significantly inadequate to address the nature and magnitude of psychosocial problems and it failed to capitalise on other local

resources. Clearly a more targeted approach seemed necessary to achieve better outcomes.

In New Zealand it seems that, within the health system at least, this same model is the predominant style of “service” delivery, and most people equate service with intervention. It is quite clear from working within this system that there are limited resources, and practices that are not time- or money-consuming are favoured over others. At the Centre where I conducted the research, the staff levels have remained the same or dropped over the last 5 to 10 years while client numbers have quadrupled, and despite recognition of the need and application for more psychological input, staff levels in that area have not been increased. There has been more money provided within mental health following some Government reforms in that area, however this does not necessarily mean that psychologists, for example, will offer more effective interventions but only that the service is bigger or that more clients can be seen. There seems to be a trend within the health system in which diagnosis leads inevitably to a specific treatment option, essentially a “cook-book” approach. The data from the present study however suggest that this is not the best practice from either a client or a professional perspective.

My study did not set out to address other important matters such as causal factors or diagnostic issues, but rather focused on intervention and the process of change for children meeting certain diagnostic criteria, collectively known as ADHD. Nevertheless, some comments need to be made on these issues, as they impinge on the present study and other research in the area. Hinshaw (1997) stated, “The underlying primary causal factors need not serve as the exclusive (or even necessary) foci of intervention efforts” (p.9). In terms of social validity or public/social acceptance of intervention procedures and the implementation of these procedures, it

makes sense that our efforts are guided by good practice based on sound theory. The use of medication and the pathologising of children's behaviour are questionable if behaviour is seen to be produced and/or maintained by psychosocial factors. Likewise, the use of behavioural procedures for what might be considered an inherently organic problem may be considered to be of little or no value. According to Sameroff (1995) "...there will never be a single intervention strategy that can solve all developmental problems. Cost-effectiveness will not be found in the universality of a treatment but in the individuation of programs that are targeted at the relevant nodal points for a specific child in a specific family in a specific social context" (p.682). Clearly, pitting one treatment against another perpetuates the notion that one size fits all, and adds little to our overall knowledge of children and development. These issues are fundamental in terms of what we deliver to or provide our child/clients and their families, and seem to be especially germane in the current climate of cost/benefit ratios, managed health funding, and market-driven policies.

Interactional models. The results of my study suggest that a satisfactory intervention model is one that recognises that different interventions can have different effects on different individuals. Within the framework of the transactional model, for example, development of the child is seen as a product of a continuous dynamic interaction of the child and the experience provided by his or her family and social context (see Sameroff, 1995; Sameroff & Fiese, 1990). A child's behaviour cannot be seen out of the context in which it occurs and the context in which it occurs cannot be seen as separate.

Combined active treatments, as an overall intervention plan, may produce more favourable outcomes than individual treatment components, because combined treatments can target more potential problem areas in the absence of specific

information on cause or other characteristics of aetiology. But to favour combined interventions on this basis is to favour a “shotgun” approach to therapy over something more selective. Small changes in the child’s behaviour can generate broader positive outcomes and this process, referred to as remediation, may be all that is necessary to re-establish a well-regulated “developmental system”. For some children this may be achieved initially through the use of medication. Participant 2b provides an example in which medication helped produce not only positive changes in his behaviour but also improved his mother’s stated feelings towards him and this in turn could presumably add to changes in his behaviour. For others, redefinition of the parents’ perceptions or understanding of the child may be the most strategic intervention. This can be achieved directly through strategies such as redefining the child’s problem or the parental attributions, or indirectly as a consequence of positive changes brought about by medication or the use of other parenting strategies. Such changes may account for the reduction in problems for several children who were seen at referral but who subsequently reported improvements in their child and therefore were not included in the study. For some parents, understanding the nature of their child’s problem or development was viewed as helpful. Reeducation, through parent training for example, may improve the parents’ ability to take care of the child and thereby improve the child’s behaviour or change the parent’s perceptions of that behaviour.

There may be other factors that make change more difficult. Campbell (1995) suggested that while earlier family adversity may not necessarily predict continuing problems, problems are more likely to persist in the context of ongoing and concurrent family adversity. Improvements in child behaviour and some change in family relationships, as seen in my study, are important because they reduce the

overall level of risk for poorer outcomes in the long term (e.g., Lynam, 1996). The process of change generated by a treatment or a combination of treatments steers children and their families on to new and happier directions.

The transactional model, while useful, still does not provide an adequate overarching or metatheoretical framework by which to address assessment and intervention procedures. Another model is Staats' (1996a, 1996b) "psychological behaviorism", which was derived from studying basic behavioural repertoires, such as language and emotion, and considers what they are, how they are learned and how they function in affecting the individual's experience, learning and behaviour. As suggested by Evans (in press), the interactionism that is central to "psychological behaviorism" theory provides a strong bridge between behavioural and ecological models of childhood needs. Clinical practice is guided by the interaction between conditions of the environment or "syndromes" and the skills brought to that setting by the child or by the parent. Staats (1996b) gave an example of his theory by describing an intelligent child as one who has learned rich language repertoires. This child, in comparison to one who is not so intelligent, can follow directions better, or better guide his or her own behaviour by self-speech. He suggested that analyses of these basic behavioural repertoires therefore would provide a means by which to address the outcomes of low intelligence. One could apply this model to ADHD. The child who does not have a diagnosis of ADHD is one who has, for example, learned rich rule-governed behaviour repertoires. This child, in comparison to one with ADHD, can listen to and follow instructions, and wait for rewards. The child will consequently do better at home or at kindergarten. It follows that we are better able to address problems if we use analysis of these behaviours as a means for selecting targets for treatment. For example, in the present study, it perhaps would

have been beneficial to a wider range of behaviours to target fundamental behavioural repertoires, such as children's self-monitoring or self-management, rather than a less basic behavioural class, such as compliance to parental requests.

Classification models. Returning to Evans' (in press) argument, clinical practice should be theory-driven, but Thakker and Ward (1998) suggested that the assumption that "mental" disorders are essentially caused by physiological mechanisms constrains the development of theory. Little attention has been paid to the guiding theories or suitability of these theories underlying classification in clinical psychology and medicine. This is exemplified by the *DSM-IV*, which has been described as avoiding any explication of its theoretical basis yet appears to assume the validity of a biomedical model of mental disorders.

Children diagnosed with ADHD do not represent a homogenous group. Given the need for 6 out of 9 "symptoms" as part of the defining *DSM-IV* criteria for either inattention-type or hyperactive-impulsive type, one could potentially combine them in 84 different ways, without considering any other factors such as number of settings or possible combined-type. To meet the diagnostic criteria for combined-type alone, there are 7,056 possible combinations of 12 out of 18 "symptoms" (DuPaul & Ervin, 1996). Cantwell (1996) argued that clinicians who rely more on one data source than another are likely to come up with different diagnoses than those who are presented with the same data but arrange them in a different way; this applies equally well to researchers. Cantwell also maintained that there are no precise rules to determine whether a "symptom" is actually present in a particular setting or not. Furthermore, it is not clear if the specified number of "symptoms" that are needed for the diagnosis can come from different sources, such as three from a parent, two from a teacher and one from a child (Cantwell, 1996, p.6). A statement that *DSM-IV*

criteria were used to define a population does not indicate that the same diagnoses will be made comparably across populations. These diagnostic discrepancies present a major impediment to the comparison of outcomes from previous research either with each other or with the outcomes from my study. While many of the studies reviewed in the Introduction have used standard practices of the day, these practices have changed over time and also have inherent biases as discussed above.

Scotti, Morris, McNeil and Hawkins (1996) discussed three primary considerations that make the use of a classification scheme such as the *DSM* a necessity for behavioural clinicians, one of which is prognosis and treatment design. They assumed that individuals with similar patterns of behaviour might share other common features that can provide information regarding prognosis and that could point to a set of common intervention strategies. The clinician is able to apply generalisations at the nomothetic level to the idiographic level, the specific case; otherwise we have to rediscover the principles of behaviour anew for each individual. They suggest that nomothetic data give direction to functional analysis, the results of which guide treatment selection for the individual case. It is clear from the review of literature in the area of ADHD with young and school-aged children presented in my Introduction, that there is a proliferation of treatment outcome studies, mostly aimed at “diagnosis leads to treatment” and resulting in a menu of treatment options. These include medication, child behavioural programmes, social skills training, educational placement, parent training, parent education and family counselling. Such treatment-outcome oriented research is exemplified in the large scale study backed by the National Institute of Mental Health in the United States aimed at finding what treatments worked for what children under what situations. But we already have theoretical models that can adequately provide those answers. Interventions can be

categorised according to their focus on antecedents, consequences or skill building. An intervention strategy such as stimulant medication might be helpful for a child diagnosed with ADHD who has difficulty attending well to academic tasks and whose academic performance is adversely affected by attentional problems. Or alternatively, a direct academic skill-training programme might be helpful. Of course, it might be that the child receives a lot of attention that he or she might otherwise not receive for wandering around the classroom and annoying other children and therefore the focus of intervention might involve other strategies such as planned ignoring or differential reinforcement contingencies. Although we can make use of information at a nomothetic level, it is vital that interventions be individualised if they are to be effective.

Behavioural assessment model. Scotti et al. (1996) proposed a model for incorporating functional case analysis into the *DSM*. They took a middle ground that combines traditional assessment and functional analysis. As they recognise, what they suggest is not new and has been proposed earlier in the S-O-R-K-C (stimulus-organism-response-contingency-consequence) model (Kanfer & Phillips, 1970; Kanfer & Saslow, 1969). Scotti et al. (1996) however go further than this and suggest elaborating on the *DSM* Axes as a means for structuring and focusing assessment and intervention. A proposal like this seems redundant when we already have an adequate model. The S-O-R-K-C model incorporates antecedent events, environmental variables and response repertoire as well as considering the biological state of the individual, the consequence of behaviour for the individual and his or her environment and the contingency relationship between behaviour and consequences. It provides a way to relate learning principles to the modification of behaviours that are selected as therapeutic targets. It gives us a framework by which to assess the

problem as well as to intervene and monitor intervention. Scotti et al. (1996) and others (e.g., Nelson & Hayes, 1981) have argued that the *DSM* provides us with a list of key target behaviours that, at least at the nomothetic level, reveal potentially useful information about “syndromes” or common patterns of response covariation. We can, for example, use the diagnostic system as a tool for providing information about the O component in the S-O-R-K-C behavioural model and thereby consider the influence of organismic factors on the selection of target behaviours and treatment strategies. Arguably, knowledge that a child meets diagnostic criteria for ADHD versus Conduct Disorder provides some information on the advisability of using medication as a treatment, or of targeting activity level or ability to stay on task.

DuPaul and Ervin (1996) suggested that determining behavioural function (e.g., escape, attention) helps to link more general assessment data to specific treatment planning. Stimulant medication treatment is generally selected on the basis of standard or accepted practice for the diagnostic label of ADHD rather than consideration of functional aspects of behaviour for the individual. Although ADHD may have a neurobiological basis, problematic behaviours are produced and maintained by environmental antecedents and consequences. While the “symptoms” may be topographically similar, they may serve different functions across individuals (DuPaul & Ervin, 1996).

“Assessment does not end when therapy begins but rather occurs throughout the therapy process” (Wells, 1981 p.485). This process provides feedback on the validity of the working hypothesis and forces a re-evaluation of the therapeutic plan if it is not working. This then can be used as one instrument of accountability. In addition, diagnosis may be an administrative necessity or provide access to treatment.

It also may be a normalisation issue and a means of social validation of the target for treatment.

According to Voeltz and Evans (1982), relationships between responses in behavioural assessment are typically unmeasured and unrecognised (Voeltz, & Evans, 1982). They suggested that knowledge of behavioural interrelationships could provide empirical grounds for the selection of one target behaviour in preference to another. Generalised benefits and setting events are important considerations. An intervention study, where modification of negative target behaviour is associated with concomitant changes in other behaviours not treated directly, provides one source of data that addresses behavioural covariation. This change may be a direct function of the intervention or an individual effect due to change in the organisational structure of the child's repertoire. Voeltz and Evans (1982) suggested that identifying the intervention target should not be overly influenced by known treatments for particular behaviours, for example, medication to treat "hyperactivity" or parent training programmes to treat child non-compliance. But what are needed are guidelines to select a target for which the known positive treatment outcome would include maximum collateral effects.

Maccoby and Martin (1983) have suggested that maternal response to a child's requests and a history of positive warm interaction set the stage for the development of compliance and other internalised controls. Malins and Evans (1998) found that while a standard behaviour management parent programme and a programme in which mothers were given interactive strategies sensitive to their children's abilities were both quite effective in reducing target behaviour problems, it was the latter that produced a positive change in perception of and relationship with the child. As illustrated by Participant 1d, for example, the use of story reading as the

special time activity may have led to positive changes in child behaviour, by increasing positive parental attention and improving the mother-child relationship. The activity of story reading provided a setting in which the parent and child could develop a level of closeness and perhaps it was these changes in the relationship, rather than the treatment package per se, that brought about positive effects.

Practical Considerations

Adelman (1995) suggested that an increased focus on psychosocial problems underscored the necessity of moving beyond current clinical intervention models to address the full range of behavioural, emotional and learning problems. He suggested that we need comprehensive and integrated approaches that might include several interventions or programmes concurrently and over time, especially given that it is likely that the individual may have more than one problem. This integrated approach avoids piecemeal or fragmented implementation of interventions. As Evans (in press) indicates, clinical treatment plans almost always have multi-components whereas treatments evaluated in formal therapy outcome trials usually investigate only one element. He further suggests that integrated theory approaches provide a more accurate picture of what clinical practice is actually like than do treatment outcome studies. Clearly we need research measures that better identify and match the clinical process.

As mentioned several times now, the overall finding in my study was that combined treatments produced the most favourable change in reducing levels of hyperactivity, impulsivity and inattention, and to a lesser extent oppositional and defiant behaviours. Children's ability to sustain attention to task also improved. In addition, there were positive changes from pre- to post-intervention for the total sample. But these findings emerged from a background of variability in individual

response to the different treatment conditions, and from a clinical perspective, that finding seems to be the key one.

While conducting this research and being the person involved in all aspects of assessment, data collection and intervention, it became increasingly apparent that certain factors and the relations between them, not formally measured, seemed to have important relevance to the outcomes. For example, while a child's behaviour might be rated as improved on the basis of parental report, it was not exactly clear from the measures what aspect of that child's behaviour had changed, what aspect of the parent's behaviour had changed, or what had actually caused that change. Social validity also was another important factor. My study was not experimentally contrived in the sense that participants were not recruited only for research purposes. Rather, it involved children and their families, from a variety of backgrounds, who all had requested assistance from their doctor or the child's teacher and who were referred to a hospital Centre. These people were in need of help and to some extent vulnerable; they wanted to obtain assistance and change for themselves and their children, as well as feeling that their input and involvement would benefit other families in similar circumstances.

So while performance or ratings might have improved, one has to ask what that means for this child or this family. The measures used in my study were not focused on this question, and yet this turns out to be the information that we need in order to provide a valid clinical service. This information is to be found in the actual process of intervention. This has been described in that part of the Results which deals with my clinical observations and impressions. The difficulty comes in integrating and summarising these numerous observations in the absence of the possibility of tests for statistical or clinical significance.

It appeared to me that in my study, the initial number of referrals, especially the large number of 3-year-olds, indicated a need for many parents of young children to receive assistance in learning about their child and coping with the child's behaviour. The assessments revealed that there is a need for these parents to receive education on child development, support, and specific treatments for a variety of behavioural and family issues. I concluded that many of the parents needed reassurance for what they were already doing, as well as guidance on realistic expectations about their children. For example, The Parents as First Teachers programme (PAFT), introduced recently in New Zealand, has been a step in this direction. Furthermore, it seems that parent programmes need to move beyond general behaviour modification techniques (e.g., Malins & Evans, 1997). Most parents in my study did not carry out most of the procedures in the programme but found one or two key activities, such as story reading or play time with their child, that led to a significant enhancement of their relationship. For some parents, acknowledgement of their child's problem but also acceptance of their child's behaviour was helpful in changing the parent's relationship with the child, thereby changing the behaviour of both child and parent. Professionals also need to be aware of their own inappropriate biases regarding the use of labels such as ADHD or treatment options such as medication. They need to look to the broader issues of finding the best ways to help children and their families. I also would like to see a move away from "child behaviour = a problem" to a more holistic approach in which the child and the behaviour are viewed within the context in which they exist. Clinically we are faced with real "live" people, children running everywhere, children wanting attention, parents out of work, parents taking drugs, and so on. It serves research poorly if we put these factors aside or restrict them so that in the end there is

little relevance in what we have done to what we really need to know as clinicians. In the field of ADHD, we seem to be awash with outcome evaluation studies, and a shift of focus to process evaluation is long overdue.

It seemed to me that at some point in the assessment or intervention procedure in my study, parent and child either “clicked” with one another or did not; that is, the basis of their relationship changed, so that it became rewarding for both parties and interacting with one another was a happy experience, even though it was not always filled with “good” behaviour on both sides. When this moment or process occurred, positive change thereafter seemed inevitable. Whatever was suggested to the parent was followed through and both the child and parent became more responsive members in their partnership. From the data, it is not clear exactly what specific mechanisms contributed to this process for specific individuals, but it is essential that we maximise opportunities for these changes to occur. It seems that this is more achievable with young children than it might be with older children who have different demands in their lives, are at a different developmental stage, and whose parents have not had a long learning history of coping with challenging behaviour and poor interactions. So how can we make this happen?

A move toward process evaluation on the effectiveness of treatments for ADHD needs to start with the identification of all the family variables or components that have been found to be important in family life. This might necessarily be a long list, and might seem daunting to a prospective researcher, but at least it represents a clinical reality and therefore has some hope of leading to useful discoveries about treatment. In clinical practice, the assessment process could be focused on identifying which components on the list were likely to be relevant to the particular parent and child and how they could best be recognised or targeted for change in this

particular family and treatment environment. Some of the targets might include: provision of basic information such as details of ADHD; diagnosis, where appropriate, and understanding the nature of the problem so as to improve expectations and attributions of the problems; parental support through contact with other parents in similar situation, knowing that there are other children like their own, working with any grief or loss issues, as they arise from having a “different” child; identifying and changing stressors that might be barriers to change, such as history of abuse, drug-taking, limited social input; therapist support (non-judgemental); and, medical intervention for child, including monitoring of effects, so that the child is perhaps more focused and more responsive.

In this process, parents start to like their child better, the child becomes even more responsive to their parent, the parent “lightens up”, and then actually gives less instructions or reprimands, and consequently the child is better behaved. The parents have a better time and more fun with their child and enjoy their child for who they are; this child then is a happy and nurtured individual.

While this thesis was framed as a treatment-outcome evaluation, the research process has led to recognition of the limitation of that approach to clinical work. As Sameroff (1995) put it, “Static entities are illusions: At the core, everything is process” (p.674).

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APPENDIX A

INFORMATION SHEET (1)

Effectiveness of alternative treatments for young children with attentional and/or hyperactivity problems.

RESEARCH PROJECT

My name is Sandra Heriot. I am a Registered Psychologist working at the Child Development Centre (CDC) and I am carrying out research as part of my studies (D.Phil degree) at Waikato University. My research is looking at different treatments for young children who have attentional and/or hyperactivity problems. Sometimes medication is recommended for these types of problems, sometimes psychological interventions are suggested and sometimes both are recommended. My research is designed to find out what treatments work best and what kinds of things affect positive results. The two treatments that I am looking at are medication and a parent programme; these will be compared with control (placebo) treatments so that we can see if people's expectations or hopes about a treatment have an effect on the result as well.

Your child has been referred to CDC for help with this type of problem and I would like to invite you and your child to be part of the study. This would involve you coming in to see me so that I can get some general information about your child and his/her problem. I will ask you and your child's kindergarten/school teacher to fill in some forms, which should take about 1/2 an hour. I will need to assess your child on a few tests designed to measure general intellectual abilities and concentration levels, which will take about one to one and a half hours at CDC (most children enjoy these game-type tasks). The information then will be given to the Paediatrician who has been booked in to see your child in the next month or so.

If your child is suitable for the study, he or she will be randomly assigned to one of four groups:

1. medication plus parent training programme
2. medication plus support programme
3. placebo medication plus parent training programme
4. placebo medication plus support programme

Medications are taken twice daily and are monitored by the Paediatrician and myself. The parent training programme and the support programme are group programmes that will run for about 9 to 10 one-hour sessions; the sessions would be held once or twice a week at times to suit you. The parent training programme covers topics such as child development and behaviour management strategies and provides specific instruction on these strategies. The support programme covers similar topics in a less formal way and provides parent support, information on child development and positive parenting ideas. Full details on the programme will be given to you at the first session. At the end of the study, I will need to get you and the teacher to fill in the forms again and I will need to retest your child.

Some children will be assigned to a control group where they are tested at the beginning and then again when they see the Paediatrician. They would then be prescribed a specific treatment by the Paediatrician. This only would occur if: a) you happen to have waited at least two months to see the doctor; or, b) the four test groups were full (maximum of 10 in each group). No child will be made to wait to see a paediatrician just for the purposes of this study; your child will be seen as soon as possible.

APPENDIX B
INFORMATION SHEET (2)

COMPENSATION FOR INJURY DURING THE TRIAL

If you suffer physical injury as a result of your participation in this clinical trial, you may be covered by ACC. You should note, however, that eligibility for cover is not automatic. You would be in the same position as a claimant who has suffered physical injury caused by standard medical treatment. You would need to establish that you had suffered physical injury as a result of medical error or negligence, or as a result of medical mishap, that is an adverse consequence of treatment that is both rare and severe. If your claim for cover is accepted by ACC, your entitlement to compensation would depend on a number of factors, such as whether you are an earner or a non-earner. You should note that in most cases ACC provides only partial reimbursement of costs and expenses, and there is no lump sum compensation payable under current ACC legislation.

You should also be aware that if you have cover under the ACC legislation, your right to sue the researcher or anyone else involved in the clinical trial is extremely limited. If you have any questions about cover or entitlements under the ACC scheme, you should contact your nearest ACC branch office for further information before you consent to participate in this trial.

GENERAL CONDITIONS OF PARTICIPATION

You have been asked to take part in this research project which has been reviewed and approved by the Waikato Ethics Committee and University of Waikato Department of Psychology Ethical Review Committee. It is important that you know exactly what your participation in this project means. Therefore, if you are unsure about any part of this research or about what it means for you, please ask me or the person explaining it to you, about it. You may wish to discuss it with your own doctor, a family member or friend. Before you sign the consent form, I (or the Paediatrician) will ask what you understand your involvement in the research project to be, and how it will affect you. **DO NOT** sign the consent form until you understand all of the information given.

If you do not want to take part in this research project, or if you do sign this form but then change your mind and do not want to continue at any stage, let me know. In either case, you will still be given the best possible health treatment.

The Health Consumer Service is available to all patients in the Midland Regional Health area. Any client in a research project who has a concern about treatment may contact one of the people listed in the Health Consumer Service pamphlet that the researcher has given you. The freephone number is 0800-801482; Hamilton residents may phone 846-1991. Any other concerns or complaints can also be directed to my supervisor: Professor Ian Evans, at Department of Psychology, University of Waikato, Private Bag 3105, Hamilton, or by phoning (07) 856-2889. All information will be treated in the strictest confidence. A summary of the results will be posted to you when the research is finished. Please do not hesitate to contact me if you have any queries or require further information. I can be reached at CDC, ph 839-8726 extn 6940, or on 856-8034.

PARTICIPATION CONSENT FORM: Participant's Copy

Name of Research Project: Effectiveness of alternative treatments for preschool children with attentional and/or hyperactivity problems.

Name of Researcher: Sandra Heriot

I have received a copy of the information sheet. The researcher has explained it to me and I have had a chance to discuss it with other people. Any questions have been answered to my satisfaction. I have read and understood all the information, including the information about compensation should injury be caused to me as a result of participating in this research project.

I agree to participate in this research project and my child has verbally consented to participate. I understand that I may withdraw at any time.

Signature: _____

Printed name: _____

Date: _____

-----Detach-----

PARTICIPATION CONSENT FORM: Researcher's Copy

Name of Research Project: Effectiveness of alternative treatments for preschool children with attentional and/or hyperactivity problems.

Name of Researcher: Sandra Heriot

I have received a copy of the information sheet. The researcher has explained it to me and I have had a chance to discuss it with other people. Any questions have been answered to my satisfaction. I have read and understood all the information, including the information about compensation should injury be caused to me as a result of participating in this research project.

I agree to participate in this research project and my child has verbally consented to participate. I understand that I may withdraw at any time.

Signature: _____

Printed name: _____

Date: _____

APPENDIX C
FAMILY HISTORY/DEVELOPMENT QUESTIONNAIRE

Please answer all questions where possible. However, if you object to answering a question, are unsure of the details or do not understand a question, then leave it out. All details will be held in the strictest confidence and will not be made available to persons other than the researcher without your written permission.

Date _____

Completed

by _____

1. General information about child

Child's full name _____

Date of birth _____ Age _____ Sex _____ Race _____

Address _____ Phone no (home) _____

_____ Contact Phone _____

Who referred your child? _____

What are the main reasons for referral? _____

2. Information about family

Parents with whom the child is now living

Mother's name _____ Age _____ Father _____ Age _____

_____ natural (biological) mother

_____ stepmother

_____ adoptive mother

_____ foster mother

_____ other

_____ natural (biological) father

_____ stepfather

_____ adoptive father

_____ foster father

_____ other

Education level (highest form, exam or degree)

Education level (highest form, exam or degree)

Usual

occupation _____ Occupation _____

Are the parents?

Married/de facto _____ Separated _____ Single _____ Divorced _____ Widowed _____

Siblings

Name _____ Birthdate _____

Who else lives in the home? (e.g., grandparents, uncles, aunts, etc.)

Name _____ Age _____
Relationship _____Name _____ Age _____
Relationship _____

Please list any major medical, learning or emotional problems in other members of the family. (e.g., learning disability, intellectual disability, speech problems, depression, alcoholism, etc.)

Relation (specify maternal or paternal)	Age	Problem
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

3. Developmental factors**A. Prenatal:**

1. Any problems during pregnancy? If yes, provide details.
2. Alcohol, caffeine, cigarettes, medications, etc. during pregnancy? If yes, provide details.
3. Any infections, accidents, etc. during pregnancy? If yes, provide details.

B. Perinatal: Complications of delivery

Gestation period (e.g., normal = 40 weeks) _____ weeks

Long labour?	___ Yes	___ No	___ Not sure
Haemorrhage?	___ Yes	___ No	___ Not sure
Cord around neck?	___ Yes	___ No	___ Not sure
Delayed breathing?	___ Yes	___ No	___ Not sure
Other details?	_____		

Type of delivery (e.g., normal, caesarian, breech, induced, forceps)

Birth weight _____ APGAR scores (if known) at 1 minute ___ at 5 minutes _____

Any health complications following birth? _____

C. Postnatal period/infancy:

Were there early feeding problems? _____ Yes _____ No
 Details

Was the child colicky? _____ Yes _____ No

Were there any sleep problems? _____ Yes _____ No
 Details

Any other difficulties? _____ Yes _____ No
 Details

How would you describe your child as a baby?(e.g., placid, easy-going, irritable, etc.)

D. Developmental milestones

Sitting up _____ Crawling _____ Walking _____
 Single words _____ Two words together _____
 Toilet-training (Bladder) _____ (Bowel) _____

4. Medical History

Any significant physical illness?	___ Yes	___ No
Has your child had any problems with:		
hearing	___ Yes	___ No
eyesight	___ Yes	___ No
fine or gross motor co-ordination	___ Yes	___ No
speech articulation	___ Yes	___ No
allergies, including asthma, eczema, etc.	___ Yes	___ No
eating or sleeping	___ Yes	___ No

Has your child had any of the following:

operations	<input type="checkbox"/> Yes	<input type="checkbox"/> No
hospitalisations	<input type="checkbox"/> Yes	<input type="checkbox"/> No
head injuries, meningitis	<input type="checkbox"/> Yes	<input type="checkbox"/> No
seizures, major headaches	<input type="checkbox"/> Yes	<input type="checkbox"/> No
repeated ear infections	<input type="checkbox"/> Yes	<input type="checkbox"/> No
Is your child on any medications?	<input type="checkbox"/> Yes	<input type="checkbox"/> No

If you answered yes to any of the above questions, please give any additional information:

5. Social/educational

How does your child get on with brothers and/or sisters? _____

How does your child get on with other children? _____

How does your child get on with adults? _____

Has your child attended daycare, preschool, kindergarten or school? If yes, please give details.

Where does your child go now? - for how many hours day/week. Does your child receive any special assistance (e.g., speech therapy, teacher-aide)?

5. Current behavioural (or other) concerns

Please list any concerns that you may have about your child. Also, please give details of any interventions that you have tried (e.g., medication, attended course on child management, homeopathic remedies, etc).

Please list your child's good points and things that your child enjoys doing.

BEHAVIOURAL OBSERVATIONS – Coding Sheets and Behavioural Categories
CODING SHEET - COMPLIANT BEHAVIOUR TASK

Minute	1			2			3			4			5		
	Par.	Child	Par.												
1	CRR	Cpy	A												
	RRR	Ncpy		RRR	Ncpy		RRR	Ncpy		RRR	Ncpy		RRR	Ncpy	
	RRR	Neg	PNeg												
2	CRR	Cpy	A												
	RRR	Ncpy		RRR	Ncpy		RRR	Ncpy		RRR	Ncpy		RRR	Ncpy	
	RRR	Neg	PNeg												
3	CRR	Cpy	A												
	RRR	Ncpy		RRR	Ncpy		RRR	Ncpy		RRR	Ncpy		RRR	Ncpy	
	RRR	Neg	PNeg												
4	CRR	Cpy	A												
	RRR	Ncpy		RRR	Ncpy		RRR	Ncpy		RRR	Ncpy		RRR	Ncpy	
	RRR	Neg	PNeg												
5	CRR	Cpy	A												
	RRR	Ncpy		RRR	Ncpy		RRR	Ncpy		RRR	Ncpy		RRR	Ncpy	
	RRR	Neg	PNeg												
6	CRR	Cpy	A												
	RRR	Ncpy		RRR	Ncpy		RRR	Ncpy		RRR	Ncpy		RRR	Ncpy	
	RRR	Neg	PNeg												
7	CRR	Cpy	A												
	RRR	Ncpy		RRR	Ncpy		RRR	Ncpy		RRR	Ncpy		RRR	Ncpy	
	RRR	Neg	PNeg												
8	CRR	Cpy	A												
	RRR	Ncpy		RRR	Ncpy		RRR	Ncpy		RRR	Ncpy		RRR	Ncpy	
	RRR	Neg	PNeg												
9	CRR	Cpy	A												
	RRR	Ncpy		RRR	Ncpy		RRR	Ncpy		RRR	Ncpy		RRR	Ncpy	
	RRR	Neg	PNeg												

Child's Name: _____ Date: _____ Completed By: _____

Coding Procedure and Behavioural Categories

The observer recorded what the parent did, what the child did in response to the parent's commands and the parent's reaction to the child's behaviour. All of these responses were recorded in 1-min. sections for a period of 10 min. Parent and child behaviours were marked using numbered columns in the coding sheet. A new column was used when the parent gave a new command or task to the child. When the parent issued a new command, C was circled, below the heading "Par". Each time the parent repeated this command R was circled. Cpy was circled below the word "Child" if the child complied with the initial command within 10 seconds. Otherwise, Ncpy was circled, indicating non-compliance to the initial command. The 10-second interval for the child to comply began when the initial command (C) was given. Compliance to repeat commands (R) was not scored. If the child displayed opposition, refusal, whining, complaining, or behaviour resistant to the initial or any repeated command, it was scored (Neg). If the parent attended to or praised the child's compliance to this command, A was circled below the column marked "Par". If the parent yelled at, reprimanded or behaved negatively towards the child, then PNeg was circled. With the exception of repeat commands (R), all other categories were scored only once during those parent-child interactions surrounding a command.

The observer used a tape recorder with a cassette that had been recorded with the verbal cue of "Begin minute 1...Begin minute 2...", etc. to mark the beginning of each minute. Each row contained five rectangles and each rectangle corresponded to interactions surrounding an original command issued by the parent. The rectangles were numbered at the top of each column of the coding sheet. This allowed space for recording up to five original commands per minute issued by the parent. A stopwatch was used to count the 10-second interval for compliance to a command.

The behavioural categories are described below:

1. Original command (C)

In this category are direct statements that contain imperatives or indirectly stated or implied commands that may be stated as interrogatives. In general, a statement is considered a command if it states or implies that an action is required from the child to start something, stop something or change to doing something else. Examples include: (a) Imperatives e.g., come here and...; let me...; put this...; I want you to....; Stop that!; No! (when used to get the child to stop doing something); or, Now you are to..., (b) Interrogatives, e.g., Will you hand me...?; Why don't you...?; Shall we...?; Can you...?; Would you...?

2. Repeat Command (R)

This is any repetition of a command previously given by the parent where no new command has been given by the parent between the original command and its repetition and when the child has not complied with the original instruction. A repeat command is scored if it occurs from five seconds after the original command. If the parent gives a new command, gives a different command, and then goes back to repeat

the first command, each of these would be scored as original commands (C), and not as a repetition of a command. Examples include: (a) "Pick up the crayon...Pick it up! I said pick up that crayon!" This would be scored as an original command (C), then two repeat commands (R) on the coding sheet, and (b) "Pick up the crayon...Get me that block...Now, go back and pick up that crayon like I told you to do." This would be scored as three original commands (C), since a different command was placed between the first command and its repetition.

3. Child compliance (Cpy)

This category is scored when the child's behaviour is in direct response to the parent's command and fulfils the action required by the parent. Any degree of compliance, from approximation to full compliance, is scored in this category. Even if the child is having a tantrum, as long as he or she has begun to comply with what was requested by the parent, the child is scored as having complied with the command. Compliance is scored only if it is initiated within 10 seconds of the original command being given by the parent and is scored only once to that original command. Compliance to repeat commands is not scored.

4. Child Non-compliance (Ncpy)

This category is scored if the child fails to initiate compliance to a parent's command within 10 seconds after the original command is given.

5. Child Negative (Neg)

This category is scored if the child engages in verbal or nonverbal behaviour that conveys refusal, anger, or discouragement in direct response to the parent's original command (C) or a repeat command (R). Examples are saying "No!" to a parent's command, whining, hitting, kicking, saying "I don't want to", pushing, throwing things, pulling away sharply from the parent's grasp, throwing tantrums, crying, swearing or name-calling at the parent or displaying other negative reactions to the parents interactions. The category can be scored only once during a command-repeat command sequence. Once the parent shifts to a new original command (C), the category can be scored again.

6. Parent Approval (A)

This category contains both verbal and nonverbal actions that convey parental approval, encouragement or acceptance of the child's activities. Some judgement is required as to the context and emotional tone of these remarks or gestures. In general, when these responses follow the completion of an activity by the child, they are scored as praise. Examples include: (a) verbal responses such as OK, Good, That's fine..., I like it when you..., Terrific!, or That was very nice..., and (b) nonverbal responses such as pat on the back, kiss, clapping hands for child's performance, or gestures of approval such as thumb-up sign, winking at child.

7. Parent Negative (PNeg)

This category includes both verbal statements and nonverbal actions conveying discouragement, non-acceptance, or disapproval of the child's activities. Again, some judgement is required concerning the context and emotional tone accompanying the gesture or action. Sometimes parents issue a repeat command with a threat, such as "If you don't pick up those toys, I'll smack you!" This would be scored as parent negative (PNeg) rather than as a repeat command. Examples include: (a) direct verbal responses such as "No, don't do that...!", "Stop!", "Quit that...!", "That's all wrong...", "That's not right...", or I don't like that...", (b) indirect verbal responses such as "You're acting like a baby...", or "You'd better watch it or ...", and (c) nonverbal responses such as smack, hit, pinch, pull at child, shove child, shaking head 'no', raising hand in threatening gesture, or shaking a finger at child in disapproval.

CODING SHEET - ATTENTIONAL BEHAVIOUR TASK

	1	2	3	4	5	6	7	8	9	10
Off-task										
Fidgeting										
Vocal										
Play object										
Out seat										

	11	12	13	14	15	16	17	18	19	20
Off-task										
Fidgeting										
Vocal										
Play object										
Out seat										

	21	22	23	24	25	26	27	28	29	30	total
Off task											/30 %
Fidgeting											/30 %
Vocalising											/30 %
Play obj.											/30 %
Out seat											/30 %
										total	/150 %

Child's Name: _____ Date: _____ Completed by: _____

Coding Procedure and Behavioural Categories

Each 10-second interval was indicated on a tape-recorder. For each interval, the observer coded occurrence of the five targeted behaviours, no matter when the behaviour occurred during the interval. The behavioural categories are:

1. Off-task

This category is scored if the child interrupts his or her attention to the task to engage in some other behaviour. Attention is defined as looking at the task materials or parent and actively engaging in the task (i.e., using the pencils to draw, gathering paper, turning pages of the book, pointing to pictures in the book).

2. Fidgeting

Any repetitive purposeless motion of the legs, arms, hands, buttocks or trunk of the body. It must occur at least twice in succession to be considered repetitive and it should serve no obvious purpose. Examples include swaying back and forth, kicking one's legs back and forth, swinging one's arms at one's side, shuffling feet from side to side, shifting one's buttocks about in the chair, tapping a pencil or finger repeatedly on the table, etc.

3. Vocalising

Any vocal noise or verbalisation made by the child that is not related to the task, e.g., whispering, singing, humming, making odd mouth noises, clicking one's teeth, etc.

4. Plays with objects

Touching any object in the room besides the table, chair, task materials, book. The child may touch his or her own clothing without being considered as playing with an object. However, touching toys, walls, light switches, curtains or any other object in the room is coded in this category.

5. Out of seat

Any time the child's buttocks break contact with the flat surface of the seat or, if reading the book on the floor or stairs, with the flat surface of the floor or stairs.

APPENDIX E**Information Sheet for Parent/Caregiver (1) for the Conners' K-CPT****UNIVERSITY OF WAIKATO****Development of norms for the Kiddy Continuous Performance Test**

My name is Sandra Heriot. I am a Registered Psychologist and a student at Waikato University (enrolled for a D.Phil degree). One of the tests I want to use in my research is called the Kiddy Continuous Performance Test (KCPT); it assesses children's ability to concentrate for a period of time. This is a new test and has not been used here or overseas. I am wanting to trial this test on preschool children so we can find out what level of performance is generally expected from young children. The results will be made available to the designers/publishers of the test. I will then be able to use this information in my main study when working with children who have attention problems.

I would like to invite you and your child to participate in this research. This would involve you filling in a questionnaire about your child (it takes about 5 to 10 minutes) and returning it with the consent form. Your child would be required to complete a 10-minute computer task (most children enjoy doing this type of thing); this would be conducted at kindergarten and carried out by myself or by a research assistant trained to give the test.

All information will be treated in the strictest confidence. Permission for this study has been obtained from the University of Waikato Department of Psychology Ethical Review Committee. A summary of the results (for your child and/or collective results) can be made available to you if requested.

Please do not hesitate to contact me if you have any queries or require further information by ringing on (07)856-8034. Any concerns or complaints can be directed to me or, if you prefer, to my supervisor:

Professor Ian Evans
Department of Psychology
University of Waikato
Private Bag 3105
Hamilton
ph:(07)856-2889.

THANK YOU FOR YOUR ASSISTANCE.

Information Sheet for Parent/Caregiver (2) for the Conners' K-CPT**UNIVERSITY OF WAIKATO****Development of norms for the Kiddy Continuous Performance Test**

My name is Sandra Heriot. I am a Registered Psychologist and a student at Waikato University (enrolled for a D.Phil degree). One of the tests I want to use in my research is called the Kiddy Continuous Performance Test (KCPT); it assesses children's ability to concentrate for a period of time. This is a new test and has not been used here or overseas. I am wanting to trial this test on preschool children so we can find out what level of performance is generally expected from young children. The results will be made available to the designers/publishers of the test. I will then be able to use this information in my main study when working with children who have attention problems.

I would like to invite you and your child to participate in this research. Your child would be required to complete a 10-minute computer task (most children enjoy doing this type of thing); this would be conducted at kindergarten and carried out by myself or by a research assistant trained to give the test. If you are willing for your child to participate in this task, please sign and return the enclosed consent form.

All information will be treated in the strictest confidence. Permission for this study has been obtained from the University of Waikato Department of Psychology Ethical Review Committee. A summary of the results (for your child and/or collective results) can be made available to you if requested.

Please do not hesitate to contact me if you have any queries or require further information by ringing on (07)856-8034. Any concerns or complaints can be directed to me or, if you prefer, to my supervisor:

Professor Ian Evans
Department of Psychology
University of Waikato
Private Bag 3105
Hamilton
ph:(07)856-2889.

THANK YOU FOR YOUR ASSISTANCE.

PARTICIPATION CONSENT FORM: Participant's Copy

Name of Research Project: Development of norms for the Kiddy Continuous Performance Test

Name of Researcher: Sandra Heriot

I have received an information sheet about this study (or the researcher has explained the study to me). I have had a chance to ask any questions and discuss my participation with other people. Any questions have been answered to my satisfaction.

I agree to participate in this research project and I understand that I may withdraw at any time.

Signature: _____

Printed name: _____

Date: _____

-----Detach-----

PARTICIPATION CONSENT FORM: Researcher's Copy

Name of Research Project: Development of norms for the Kiddy Continuous Performance Test

Name of Researcher: Sandra Heriot

I have received an information sheet about this study (or the researcher has explained the study to me). I have had a chance to ask any questions and discuss my participation with other people. Any questions have been answered to my satisfaction.

I agree to participate in this research project and I understand that I may withdraw at any time.

Signature: _____

Printed name: _____

Date: _____

APPENDIX F

PROCEDURAL RELIABILITY CHECKLIST

Step 1

Completed By: _____ Date: _____

brief update on status of child and family	Yes	Moderate	No
rational and purpose of programme; description of sequence of training steps	Yes	Moderate	No
information on normal child development	Yes	Moderate	No
specific issues pertaining to ADHD	Yes	Moderate	No
time for questions, expectations of outcome	Yes	Moderate	No
handout on programme and general information	Yes		No

PROCEDURAL RELIABILITY CHECKLIST - STEP 2

Completed By: _____ Date: _____

review of previous session	Yes	Moderate	No
conceptual framework for understanding development of parent-child interactions (four-factor model)	Yes	Moderate	No
overview of general behaviour management principles	Yes	Moderate	No
inventories on child and parent characteristics	Yes		No
assignment of activities for home	Yes		No

PROCEDURAL RELIABILITY CHECKLIST - STEP 3

Completed By: _____ Date: _____

home activities/worksheets completed	Yes	Moderate	No
review of home activities and general issues	Yes	Moderate	No
positive attention	Yes	Moderate	No
special play time	Yes	Moderate	No
information on special time procedures	Yes		No
handout on practising positive parenting through special time (example and worksheets)	Yes		No
suggestions for giving positive feedback and approval	Yes		No
assignment of activities for home	Yes		No

PROCEDURAL RELIABILITY CHECKLIST – STEP 4

Completed By: _____ Date: _____

home activities/worksheets completed	Yes	Moderate	No
review	Yes	Moderate	No
adaptive attributions and beliefs	Yes	Moderate	No
handout in session	Yes		No
adaptive behavioural interchanges	Yes	Moderate	No
handout in session	Yes		No
expanding positive attention to other situations	Yes	Moderate	No
effective commands	Yes	Moderate	No
information on effective commands	Yes		No
practising positive attention and reinforcement charts	Yes		No
assignment of activities for home	Yes		No

PROCEDURAL RELIABILITY CHECKLIST – STEP 5

Completed By: _____ Date: _____

home activities/worksheets completed	Yes	Moderate	No
review	Yes	Moderate	No
overview of token system	Yes	Moderate	No
rewards/privileges and chores/rules	Yes	Moderate	No
information on token system	Yes		No
ideas for rewards	Yes		No
video	Yes		No
assignment of home activities	Yes		No

PROCEDURAL RELIABILITY CHECKLIST – STEP 6

Completed By: _____ Date: _____

home activities/worksheets completed	Yes	Moderate	No
review	Yes	Moderate	No
overview of response cost system	Yes	Moderate	No
assignment of activities for home	Yes		No

PROCEDURAL RELIABILITY CHECKLIST – STEP 7

Completed By: _____

Date: _____

home activities/worksheets completed	Yes	Moderate	No
review	Yes	Moderate	No
problem areas to be targeted	Yes	Moderate	No
home situations questionnaire-revised given out	Yes		No
time-out procedure reviewed	Yes	Moderate	No
handout on time-out	Yes		No

PROCEDURAL RELIABILITY CHECKLIST – STEP 8

Completed By: _____

Date: _____

review	Yes	Moderate	No
identify other problem areas	Yes	Moderate	No
review previously employed strategies	Yes	Moderate	No
establish plan for dealing with other problems	Yes	Moderate	No
perceptions of what others will think	Yes	Moderate	No
handout summarising strategies discussed in session	Yes		No

PROCEDURAL RELIABILITY CHECKLIST – STEP 9

Completed By: _____

Date: _____

review	Yes	Moderate	No
feedback	Yes	Moderate	No
future problem areas and plan to handle them	Yes	Moderate	No
follow up issues	Yes	Moderate	No

PROCEDURAL RELIABILITY CHECKLIST – STEP 10

Completed By: _____

Date: _____

readminister rating scales, questionnaires	Yes		No
further review and refinement of strategies	Yes	Moderate	No

APPENDIX G

PROGRAMME EVALUATION FORM

The following is part of the evaluation of the training programme that you have received. Your co-operation is greatly appreciated. Please circle the response that best expresses your opinion about the programme.

A. THE OVERALL PROGRAMME

1. The major problems that brought me to CDC are now

1	2	3	4	5	6	7
considerably worse			same			considerably better

2. How do you feel about your child's progress now?

1	2	3	4	5	6	7
very dissatisfied			neutral			very satisfied

3. How has the treatment programme helped or hindered with any other personal or family problems (not directly related to your child)?

1	2	3	4	5	6	7
hindered very much			neither			helped very much

4. Treating your child's behaviour problems by using this type of parent programme is

1	2	3	4	5	6	7
very appropriate			neutral			very inappropriate

5. Treating your child's behaviour problems by using medication is

1	2	3	4	5	6	7
very inappropriate			neutral			very appropriate

6. How confident are you to manage *future* behaviour problems using what you have learned from this programme?

1	2	3	4	5	6	7
very unconfident			neutral			very confident

7. Would you recommend the parent programme to a friend or relative?

1	2	3	4	5	6	7
strongly recommend			neutral			strongly not recommend

B. SESSION FORMAT

Difficulty:

Now I'd like to know if the sessions were easy or difficult for you to follow.

1. Session information

1	2	3	4	5	6	7
extremely easy			neutral			extremely difficult

2. Practice of skills at home

1	2	3	4	5	6	7
extremely easy			neutral			extremely difficult

3. Other activities that were assigned for home

1	2	3	4	5	6	7
extremely easy			neutral			extremely difficult

4. The written material that you were given to read

1	2	3	4	5	6	7
extremely easy			neutral			extremely difficult

Usefulness:

In this section, I'd like to find out how useful the sessions were for you.

1. Session information

1	2	3	4	5	6	7
extremely not useful			neutral			extremely useful

2. Practice of skills at home

1	2	3	4	5	6	7
extremely not useful			neutral			extremely useful

3. Other activities assigned for home

1	2	3	4	5	6	7
extremely not useful			neutral			extremely useful

4. The written material that you were given to read

1	2	3	4	5	6	7
extremely not useful			neutral			extremely useful

C. SPECIFIC PARENTING TECHNIQUES**Difficulty:**

In this section, I'd like to know how easy or difficult it is to do the following techniques.

1. Attending to positive behaviour

1	2	3	4	5	6	7
extremely easy			neutral			extremely difficult

2. Rewards

1	2	3	4	5	6	7
extremely easy			neutral			extremely difficult

3. Special playtime

1	2	3	4	5	6	7
extremely easy			neutral			extremely difficult

4. Giving effective commands

1	2	3	4	5	6	7
extremely easy			neutral			extremely difficult

5. Time-out

1	2	3	4	5	6	7
extremely easy			neutral			extremely difficult

Usefulness:

In this section, I'd like to find out how useful the following techniques are in improving your interaction with your child and decreasing his/her inattention, impulsive, hyperactive and/or non-compliant behaviour now.

1. Attending to appropriate behaviour

1	2	3	4	5	6	7
extremely not useful			neutral			extremely useful

2. Rewards

1	2	3	4	5	6	7
extremely not useful			neutral			extremely useful

3. Special playtime

1	2	3	4	5	6	7
extremely not useful			neutral			extremely useful

4. Giving effective commands

1	2	3	4	5	6	7
extremely not useful			neutral			extremely useful

5. Time-out

1	2	3	4	5	6	7
extremely not useful			neutral			extremely useful

D. SESSIONS

In this section, I'd like to get your ideas about the sessions/group.

1. How did you find the teaching/facilitating?

1	2	3	4	5	6	7
very poor			average			superior

2. How did you find the group?

1	2	3	4	5	6	7
disliked very much			neutral			liked very much

E. YOUR OPINION PLEASE!

1. What part of the programme was most helpful to you?
2. What did you like most about the programme?
3. What did you like least about the programme?
4. What part of the programme was least helpful to you?
5. How could the programme have been improved to help you more?
6. How helpful was the use of medication/placebo in managing your child's behaviour problems?
7. Anything else?

THANKS FOR YOUR HELP.

APPENDIX H

Psychometric properties of tests and rating scales

1. ADHD Rating Scale-IV; Parent and Teacher versions

These rating scales were devised by DuPaul, Power, Anastopoulos, and Reid (1998) and are based on the DSM-IV diagnostic criteria for ADHD. Eighteen scale items were written to reflect DSM-IV criteria with the primary change of omitting the word "often" from the symptomatic description. The sample used to conduct factor analyses of the Home Version included 4,860 children and adolescents aged between 4 and 20 years from 22 school districts across the United States and from a variety of ethnic backgrounds. The sample used for the School Version included 4,130 children and adolescents between the ages of 4 and 19 years from 31 school districts. The normative sample for the Home Version consisted of 2,000 children aged from 4 to 20 years randomly selected from the overall sample used for the factor analyses. Similarly, 2,000 children were selected for the School Version normative sample. Because very few cases were available for 4-, 19-, and 20-year-olds, these ages were not included in the normative data set and consequently only raw score data have been used in this study. Both versions of the scale and the subscales have adequate levels of test-retest reliability (alpha coefficient $>.78$ for 4-week interval) and internal consistency (alpha coefficient $>.86$). Interrater agreement coefficients between parents and teachers were in the moderate range, as follows: (a) Total score $r = .41$, (b) Inattention $r = .45$, (c) Hyperactivity-Impulsivity $r = .40$.

2. Conners' Parent Rating Scale-Revised: Long Version, CPRS-R:L, Conners' Teacher Rating Scale-Revised: Long Version, CTRS-R:L (Conners, 1997).

These scales are often used in the assessment of child behaviour problems and contain information that corresponds to the ADHD criteria in the DSM-IV. They are used for children aged 3 to 17 years. The CPRS-R:L contains 80 items and the CTRS-R:L contains 59 items. The subscales are identical, except for the Psychosomatic subscale which does not appear in the CTRS-R:L. There are 14 subscales (the number of items in each subscale is reported with the number in the parent version reported first): (a) Oppositional (10/6 items), (b) Cognitive problems (12/7 items), (c) Hyperactivity (9/7 items), (d) Anxious-shy (8/6 items), (e) Perfectionism (7/6 items), (f) Social problems (5/5 items), (g) Psychosomatic (6/0 items), (h) ADHD index (12/12 items), (i) Conners' Global Index Restless-Impulsive (7/6 items), (j) Conners' Global Index Emotional Lability (3/4 items), (k) Conners' Global Index Total (10/10 items), (l) DSM-IV Inattentive (9/9 items), (m) DSM-IV Hyperactive-Impulsive (9/9 items), and (n) DSM-IV Symptoms subscale (18/18 items). Both versions require an American 9th Grade (i.e., approximately 14-year-old) reading level. The long versions take approximately 15 to 20 minutes to administer.

Normative data for the revised versions came from a large (8,000+) community-based sample of parents and teachers collected throughout the United States and Canada from 1993 to 1996. Normative data for the 3- to 5-year-old age group were based on a sample of 375 parents and 198 teachers. Internal reliability coefficients for this age group range from .69 to .94 on each of the subscales of the CPRS-R:L and from .74 to .96 on the CTRS-R:L. The stability of the subscales on the CPRS-R:L was examined on a sample of 49 children with a mean age of 11.78 years ($SD = 3.68$) and the stability of subscales on the CTRS-R:L was examined on a sample of 50 children with a mean age of 11.24 ($SD = 3.45$). Six- to eight-week test-retest reliability coefficients range from .47 to .85 on the CPRS-R:L and from .47 to .88 on the CTRS-R:L. Discriminant validity of the subscales on the CPRS-R:L and the CTRS-R:L was examined with two groups of children for each version: (a) 91 children diagnosed with ADHD for the parent version and 154 children for the teacher version, and (b) equally numbered samples of randomly selected non-clinical and matched children. Apart from nonsignificant differences on the Anxious-shy and Perfectionism subscales on the CPRS-R:L and the Social Problems subscale on the CTRS-R:L, all other subscales significantly discriminated between the two groups.

Scores from two subscales were used in this study: (a) Oppositional, and (b) Conners' Global Index Total. The items in the Oppositional subscale relate to the child being likely to break rules, having problems with authority and being easily annoyed. The Global Index subscale relates to

general problematic behaviour, including hyperactivity, and has been previously known as the "Hyperactivity Index". It has been used extensively in research on ADHD and reported to be one of the best short measures for assessing general psychopathology and for monitoring treatment effectiveness and changes over time (Conners, 1997; Wainwright & MHS Staff, 1996).

3. Child Behavior Checklist/2-3; CBCL/2-3 (Achenbach, 1992), and Child Behavior Checklist/4-18; CBCL/4-18 (Achenbach, 1991).

The Child Behavior Checklist is a standardised form for assessing children's behavioural and emotional problems. Two versions of the CBCL were administered in this study: the CBCL/2-3 is a 100-item form used for children aged less than 4 years; the CBCL/4-18 is a 118-problem-item form used for children aged 4 years and over. The CBCL/2-3 was constructed from items in the CBCL/4-18 that appeared appropriate for 2- and 3-year-olds. Fifty-nine CBCL/4-18 problem items plus an open-ended item for reporting additional problems were adapted for ages 2 to 3. The other 40 CBCL/2-3 problem items were developed from interviews with parents of toddlers to identify problems that could be formulated as rateable items, as well as reviews of previous research. The total list of items on both scales includes a broad range of problems that are reported by parents.

Normative data for the CBCL/2-3 consisted of 2- and 3-year-olds who resided in the same households as the national (US) sample of 4- to 18-year-olds on whom the norms for the 1991 CBCL/4-18 profile were based as well as participants from the general population sample that had been used to norm the 1986 profile. This yielded a total sample of 368. The total number for the CBCL/4-18 normative sample was 2,368. Six "syndromes", factor-analytically derived subscales, were identified on the CBCL/2-3 version: (a) anxious/depressed (15 items), (b) withdrawn (14 items), (c) sleep problems (8 items), (d) somatic problems (12 items), (e) aggressive behaviour (32 items), and (f) destructive behaviour (14 items). An internalizing grouping was derived from the total scores on the first two syndromes and an externalizing grouping was derived from the total scores on the last two syndromes and a total problem grouping was derived from all items, excluding items 51 and 79. Test-retest reliability coefficients for the six syndromes and three groupings ranged from .72 to .93 on the CBCL/2-3. Nine syndromes, factor-analytically-derived subscales, were identified on the CBCL/4-18 version: (a) withdrawn, (b) somatic complaints, (c) anxious/depressed, (d) social problems, (e) thought problems, (f) attention problems, (g) sex problems, (h) delinquent behaviour, and (i) aggressive behaviour. Internalizing and externalizing groupings were derived from second-order analyses; the first three syndromes were included in the internalizing grouping and the last two syndromes were included in the externalizing grouping. The mean test-retest reliability coefficients for all syndromes, internalizing and externalizing and total problems for the CBCL/4-18 ranged from .82 to .95.

4. Family Environment Scale (FES)-Real and Ideal Forms (Moos & Moos, 1994).

The Family Environment Scale is 1 of 10 Social Climate Scales. It consists of 90 items that yield 10 subscales that measure the actual (Real), preferred (Ideal) and expected (Expectations) social environment of families. Each subscale consists of nine items. The first two forms were used in this study. The scale taps three sets of dimensions: (a) relationship, (b) personal growth or goal orientation, and (c) system maintenance and change. The first set of dimensions assesses personal relationships in the family, measuring how involved and committed they are with each other, how much they help each other and how openly they express feelings. It includes three subscales: (a) cohesion, (b) expressiveness, and (c) conflict. The second set of dimensions taps ways in which the family environment encourages or stifles personal growth. There are five subscales included in this dimension: (a) independence, (b) achievement orientation, (c) intellectual-cultural orientation, (d) active-recreational orientation, and (e) moral-religious emphasis. The third set of dimensions measures the degree of importance of clear organisation and structure in planning family activities and responsibilities and how much set rules and procedures are used to run family life. There are two subscales in this dimension: (a) organisation, and (b) control.

In general, environments promote qualities that fit with their dominant aspects. For example, children in families that value independence, achievement and intellectual and recreational pursuits are likely to show more personal and social competence. When a setting emphasises relationship dimensions, people are more satisfied. Cohesion in particular strengthens the influence of personal growth dimensions. It makes it easier for people to deal with very demanding, stressful

environments (Moos, 1994). The scales measure the strength of social bonds in different settings and have helped to demonstrate that such bonds within families and at work help people deal with life stressors. For example, high family cohesion and expressiveness and low conflict have been found to predict better adjustment among individuals who were experiencing stressful circumstances (Holahan & Moos, 1990). These three Family Environment Scale relationship dimensions have been used to construct a Family Relationships Index (Hoge, Andrews, Faulkner, & Robinson, 1989; Moos & Moos, 1994). The Family Relationships Index, a 27-item index of the quality of family relationships, is the sum of the Cohesion, Expressiveness and Conflict (reversed) subscales. It has high internal consistency (Holahan & Moos, 1981; 1983) and good construct validity and has been used extensively as a summary measure of family support (see Bloom & Spiegel, 1984; McGee, Williams, & Silva, 1984).

The Real form of the Family Environment Scale was normed on 1,432 normal and 788 distressed families while the Ideal form was normed on 591 individuals from a varied group of families. Internal consistencies and test-retest reliability coefficients with a 2-month interval between assessments for the 10 subscales of the Real Form range from .61 to .78 and from .68 to .86, respectively. Family Environment Scale profiles of normal families show average correlations of about .80 over 1- to 2-year intervals. Certain characteristics of the family environment, such as moral-religious emphasis and organisation, may remain relatively stable over intervals as long as 10 years whereas other characteristics such as conflict, independence and control tend to change somewhat more over these longer intervals (Moos & Moos, 1994).

5. Parent Acceptance Rejection Questionnaire; Parent version (PARQ).

The Parent Acceptance Rejection Questionnaire is one of several questionnaires and interview schedules developed by Rohner (1980) primarily to promote and facilitate what he calls the cross-cultural and "intranational" study of parent acceptance-rejection and its correlates. An underlying objective is to reliably predict the major antecedents and consequences of parental acceptance and rejection everywhere, regardless of differences in culture, language, physical type or other possibly limiting conditions. Parental acceptance and rejection together form the warmth dimension of parenting. Warmth is construed as a bipolar dimension where rejection, or the absence of parental warmth and affection, is at one pole of the scale and acceptance is at the other end. Accepting parents are defined as those who show their love or affection toward children physically and/or verbally (e.g., hugging, kissing or caressing a child, complimenting or praising) and induce a child to feel loved or accepted. Rejecting parents are those who dislike, disapprove of or resent their children and view them as a burden or compare them unfavourably with other children. According to Rohner (1980), rejection is manifested in the form of hostility or aggression and in the form of indifference and neglect; aggression and neglect are forms of observable behaviour that are manifested, to a large extent, by the internal states of hostility (i.e., anger) and indifference (i.e., lack of interest or concern), respectively.

The Parent Acceptance Rejection Questionnaire assesses the parent's perceptions of his or her behaviour towards the child in terms of (a) warmth/affection (20 items), (b) hostility/aggression (15 items), (c) indifference/neglect (15 items), and (d) undifferentiated rejection (10 items). The Adult Parent Acceptance Rejection Questionnaire was assessed on 147 undergraduates ranging in age from 18 to 43 years with an approximate mean age of 23. Internal reliabilities ranged from .86 to .95. Taken from a small sample of mothers ($n = 15$), the alpha coefficients for the Mother Parent Acceptance-Rejection Questionnaire ranged from .67 to .85. The Parent Acceptance-Rejection Questionnaire has been used in studies to differentiate between neglected and nonabused children (e.g., Gracia, 1995).

6. Behavioural observations of parent/child interaction-compliance.

The coding system used for recording parent-child interactions in this study was adapted from Barkley (1987). He employed a modified version of a coding system that had been designed by Forehand and McMahon (1981) to record non-compliance by children in parent-child interactions. He used it in different playroom situations to assess these interactions (Child's and Parent's Game). This coding system has been found to significantly discriminate between clinic-referred children and children in community samples (Mariani, & Barkley, 1997) and is reported to be sensitive to drug and dose effects and parent-training programme interventions (Barkley, 1987; Barkley et al., 1991; Barkley et al., 1988).

7. Wechsler Preschool and Primary Scale of Intelligence-Revised (WPPSI-R).

The WPPSI-R is an individually administered clinical instrument for assessing the general intellectual abilities of children aged from 3 years through to 7 years 3 months (Wechsler, 1989). It provides standardised measures of a variety of abilities thought to reflect different aspects of intelligence. The WPPSI-R includes 12 subtests, 6 Performance subtests (Object Assembly, Geometric Design, Block Design, Mazes, Picture Completion and Animal Pegs) and 6 Verbal subtests (Information, Comprehension, Arithmetic, Vocabulary, Similarities, Sentences). Two subtests, Animal Pegs and Sentences, are designated as optional and are not included in Full Scale IQ scoring. The WPPSI-R is a highly reliable instrument, especially at the level of the IQ scores. Average estimates of internal consistency reliability for the PIQ, VIQ and FSIQ are $r = .92$, $r = .95$ and $r = .96$, respectively. The validity studies in the WPPSI-R manual suggest that the test has adequate concurrent and construct validity however as indicated by Sattler (1992) this conclusion may not pertain to all ages covered by the test, particularly ages 36 to 48 months, which are new to the revision.

All raw scores are converted to standard scores. The child's Performance score is the sum of the scaled scores on the five regularly administered Performance subtests. Similarly, the child's Verbal score is the sum of the scaled scores on the five regularly administered Verbal subtests. The Full Scale score is the sum of the Performance score and the Verbal score.

8. Conners' Kiddy Continuous Performance Test (Conners' K-CPT) – Multi-Health Systems (1996).

The Conners' K-CPT is a computerised vigilance or attention test designed specifically for 3- to 5-year-old children. This test is similar to standard versions of the CPT however it is shortened to seven minutes (about half the time of the original CPT) and pictures rather than letters are used to ensure that participants are able to discriminate among the stimuli. Children have to press the spacebar or click the left mouse button for all pictures (hand, bicycle, boat, car, fish, horse, house, telephone, scissors, train) that appear on the screen, except for the picture of the ball. This test yields several measures: (a) percentage Hits, (b) percentage Omissions, (c) percentage Commissions, (d) Overall Reaction Time, (e) Hit Reaction Time, (f) Commission Reaction Time, and (g) Hit Reaction Time Standard Error.

Table H1.

Normative Data for Small Sample of New Zealand Children on Conners' K-CPT

Variable	<i>M</i>	Min	Max	<i>SD</i>	<i>SE</i>
age	4.21	3.28	4.92	.49	.07
percentage omissions	24.94	5.00	88.00	18.72	2.73
percentage commissions	42.51	4.00	88.00	22.98	3.35
overall reaction time	800.04	512.00	1208.00	163.92	23.91
hit reaction time	809.23	528.00	1193.00	160.96	23.48
commission reaction time	718.17	249.00	1321.00	223.16	32.55
hit reaction time <i>SE</i>	48.76	12.46	190.30	29.28	4.27

Note. Variable definitions: percentage omissions is the number of targets not responded to divided by total number of targets x 100; percentage commissions is the number of nontargets (i.e., the ball) responded to divided by total number of nontargets x 100; overall reaction time is the latency of response to both targets and nontargets; hit reaction time is the latency of response to targets; commission reaction time is the latency of response to nontargets; hit reaction time *SE* is the standard error of the distribution of hit reaction time.

Forty-seven children aged from 3 to 4 years, from three kindergartens in the region participated in this test as part of the normative data collection. Results are presented in Table H1. The group consisted of 17 girls and 30 boys. There was no significant effect of gender on each of the measures: (a) percentage omissions, $t(45) = .11$, $p < .05$, (b) percentage commissions, $t(45) = 1.10$, $p < .05$, (c) overall reaction time, $t(45) = .39$, $p < .05$, (d) hit reaction time, $t(45) = .29$, $p < .05$, (e) commission reaction time, $t(45) = .32$, $p < .05$, and (f) hit reaction time *SE*, $t(45) = 1.11$, $p < .05$.

APPENDIX I

Information presented in first session of parent training group

PROGRAMME OUTLINE



Programme orientation and review of ADHD

- * Brief update since first coming in
- * Purpose and description of programme
- * Information on normal child development
- * Information about ADHD
- * Questions, review, your expectations, etc.



Information about programme; books on child development and management; general information about ADHD.



Understanding how parents and children get on with one another; behaviour management

- * Review of previous session
- * Ideas about understanding development of parent-child interactions: child characteristics; parent characteristics; stresses; and, different situations
- * Overview of behaviour management



Child and parent characteristics/behaviour management.



List child characteristics; list parents' characteristics; list family stresses; parents to see how they manage their child (parenting practices).



Improving parental attending skills

- * Review of home activities and general issues
- * Positive attention
- * Special play time



Information on special time procedures; practise positive parenting through special time example and worksheets; suggestions for giving positive feedback and approval.



Carry out special play time sessions; complete worksheets.



Paying positive attention to appropriate independent play and compliance; giving commands more effectively

- * Review
- * What people think about ADHD; positive interactions
- * Using positive attention in other situations
- * Effective commands/instructions



1. What people think about ADHD, their child, their family and interactions (completed within session).
2. Information on effective commands; practising positive attention and reinforcement charts.



Complete worksheets on positive attention.

 5

Establishing home token system

- * Review
- * Overview of token system
- * Generate lists of rewards/privileges and chores/household rules
- * Rating rewards and rules
- * Video - ADHD



Information on home token system; additional ideas for rewards.

 6

Review of home token system; response cost

- * Review
- * Overview of response cost system (if appropriate)

 7

Using time-out from reinforcement

- * Review
- * Identify one or two problem areas or non-compliance to become targets of time-out
- * Time-out procedure



Home Situations Questionnaire-Revised (given within session); information on time-out procedure.



Extending time-out to other misbehaviour; managing behaviour in public places

- * Review
- * Identify other problem areas; review previously used strategies
- * Establish plan for dealing with these problems
- * Parents' ideas about what others think in these situations



Information on above strategies.



Handling future behaviour problems

- * Review all previously covered aspects of training programme
- * Parent feedback (verbal)
- * Possible future problem areas and how they will be handled
- * Follow up issues



Booster session

- * Re-administer rating scale, questionnaires, etc.
- * Further review and refinement of strategies
- * Parent feedback (written)

CHILD DEVELOPMENT (Toddlers and preschoolers)

What do children need? Parents must provide food, shelter, and constant supervision. They must provide for the child's emotional needs through love, a sense of trust and security and a balanced approach to questions and desires. Children also need the opportunity for play and companionship of other children.

What do young children need to learn?

- * learning more words
- * developing physical skills (such as hopping or using scissors)
- * finishing toilet training (bladder and bowel control)
- * knowing whether they are a girl or a boy
- * relating to others in the family
- * getting a basic sense of time
- * discovering more about the world outside the home

Three year olds spend much time getting to know themselves as individuals and what they are allowed to do (and not do!). They start to bring these things together, discovering 'me' and 'what I can do'. They try to improve their physical skills such as hopping, running and stopping, jumping and digging. They start to identify with others so they can be part of their world; they take on the gestures and behaviours of the people around them, partly as a result of imitation (copying) and partly from having their actions praised.

Most children start to build a vocabulary from 18 months of age (on average). This vocabulary increases from about 200 words at two years to between 500 and 5,000 at five! At every age, children understand more words than they actively use. At about four years of age, children become 'intoxicated' with language, making up their own words, chanting while they work or play, changing the lines of familiar chants and songs, swearing(!) and generally playing with words. For some time, they talk out loud to themselves to help them sort out what they are thinking and doing. Basically, they talk and talk....

Getting language helps children learn to think more and work things out. Three and four year olds are full of questions, being really interested in what passes as normal (to adults). All kinds of home and outside activities, mealtimes, bathtimes, etc. are chances for interrogating you!. Questions reveal concern about being dead or alive, birth and death, God, nature, dinosaurs, space, etc. The children may work out answers for themselves and want confirmation rather than explanation, asking the same question several times, over and over.

When children use words such as yesterday and tomorrow they do not necessarily understand that they are about time. In general children talk about today when they're three, tomorrow and yesterday around the age of four and also know the difference between morning and afternoon at four years.

Social responses can take odd forms in toddlers; they might make advances to other children by hitting or kicking them, however in most cases this can be treated as an unsophisticated way of saying, "I'd like to play with you". It requires adult help to give introductions and suggestions for shared play. Child conflicts are mostly solved without adult help and last on the average only 30 seconds. At about four years of age, social skills include turntaking and a basic sharing of toys.

Impulse control (thinking before you act) takes a long time to learn. When children have strong feelings they can express these when playing; when they are busy in imaginative play, they can let out their feelings on objects such as dolls or hit with hammers or use playdough. Play relaxes children because when they're playing they are not expected to do things in set ways. Play is very important for children's development. Through play children are working at growing and learning; it stimulates physical, mental, social and emotional growth.

At about four years of age, children can make basic decisions on what is right and wrong for them, based on what parents do, and how adults react to their behaviour. They learn what behaviour is acceptable and begin to see life from other people's points of view. At first their ideas of right and wrong depend on what the adults allow and don't allow. At this stage, children aren't beyond pointing out inconsistencies in adult behaviour!

In summary:

By the time the child is three or four, parents usually expect greater self-control and co-operative play with other children. The development of independence, self-control and OK peer relations occurs together with advances in cognitive (thinking) abilities.

Throughout the preschool period, children continue to show improvements in thinking, language and social skills with increasing self-awareness and understanding of the feelings and thoughts of others. By about the age of three, children start to learn about what is right and wrong, reflect on what they do, use language to plan their actions, apologise for their mistakes and expect others to do the same. Overall, behaviour becomes more organised and generally is under the control of internal rather than external processes.

The partnership principle

Are you sharing in your child's learning in a balanced, give-and-take relationship?

Children are more likely to learn when they have some clear control over their environment and their actions affect people and things in important ways. In balanced, give-and-take relationships, both parent and child have chances to influence one another in positive ways.

Matching

Are you working with your child in ways that your child can understand and can do and that give him/her chances at success?

Sensitive responsiveness

Are you helping your child to move onto the next developmental step?

Child-based nondirectiveness

Are you allowing your child enough control over his or her learning? And, are you letting your child express him/herself?

Being nondirective does not mean that all directions and controls are stopped. A nondirective way of interacting with children gives them some guided freedom.

Emotional attachment

The emotional attachment between adult and child may depend on the degree of success they experience with each other.

Info taken from:

Birch, K. (1993). *Positive parenting from toddlers to teenagers: A resource book for New Zealand families*. Auckland, NZ: Reed Publishing.

Campbell, S.B. (1990). *Behavior problems in preschoolers: Clinical and developmental issues*. NY: Guilford Press.

MacDonald, J. (1990). An ecological model for social and communicative partnerships. In S.R. Schroeder (Ed.), *Ecobehavioral analysis and developmental disabilities: The twenty-first century* (pp.154-181). NY: Springer-Verlag.

Morris, B. (1994). *Understanding children/Whakamohiotanga i nga Tamariki*. Auckland, NZ: New Zealand Playcentre Foundation. (Playcentre Publications, P.O. Box 15-886, New Lynn, Auckland 7).

ATTENTION-DEFICIT/HYPERACTIVITY DISORDER

Attention deficit hyperactivity disorder is a condition that affects about 3-5% of the school population. The main features of the disorder include age-inappropriate levels of motor activity, impulsivity and inattention. Differential diagnosis is difficult since many other physical and psychological conditions share characteristics with ADHD, including, for example, hearing and auditory processing deficits, drug abuse, anxiety and depression.

A thorough assessment is important; it involves gathering information from multiple sources (parents, teachers, others), assessing in different settings at different times of the day, looking at the different components of the condition (inattention, impulsivity and hyperactivity) and using different types of assessment procedures (interviews, observations, behaviour rating scales, standard psychometric instruments and specific tests of attention, impulsivity and activity level).

Treatments for children with ADHD sometimes include medication (mainly “psychostimulant” medications). Positive effects of psychostimulant medications such as Ritalin occur in about 50-75% of the cases of ADHD. However, medication alone is usually not enough to deal with the problems associated with the disorder. In school, teachers may need to make a variety of changes to the regular teaching programme in order to help the child with ADHD to achieve reasonable academic success. Behaviour modification approaches both at home and at school and changes in the classroom environment to reduce or eliminate distractions have proven to be helpful. With cognitive behaviour modification, the child is taught strategies for self-control and for coping with specific types of schoolwork.

Children with ADHD also frequently experience problems in social skills. A full treatment programme includes help for the child in this area as well. Families of children with ADHD typically are under considerable stress as they attempt to cope with the child’s behaviour.

HISTORICAL BACKGROUND

The condition that today is termed “Attention Deficit Hyperactivity Disorder” has been recognised for at least the last 50 years. In fact, descriptions of the associated behaviours have been remarkably consistent over the years. For example, researchers in 1941 characterised the group of children with whom they were working as hyperactive, distractible, impulsive, emotionally labile and perseverative. What have changed every few years are the names employed for the disorder.

In the 1930s and 1940s, children with the behaviours listed above were called “brain damaged” or “brain-injured” because it was known that individuals with brain damage showed similar behaviours. In the 1950s and 1960s it became clear that many children exhibited the same set of behaviours, although a definite history of brain trauma or the presence of abnormal neurological signs could not be documented. The assumption was made that neurological dysfunction nevertheless were at the root of the problems; they were just too subtle to be detected with the medical procedures available.

Therefore, the terms “minimal brain damage” or “minimal brain dysfunction” came into common use.

“Hyperactive” became the term of choice in the 1960s; it made sense at the time to use a term that described the observable behaviour - excessive motor activity at that time was considered to be the central problem. By the 1970s most professionals were in agreement that difficulties in attention and concentration were more critical than activity problems as primary problems of the disorder. It was mainly because they could not pay attention, rather than because of their amount of movement, that these children experienced so much social and academic difficulty. This change in perspective was given official recognition with the publication of the third edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-III) in 1980, published by the American Psychiatric Association. The DSM was revised in 1987 and in the latest edition *DSM-IV* (1994) problems with either attention alone or hyperactivity-impulsivity alone are sufficient for a diagnosis of ADHD, assuming other diagnostic conditions are met.

CURRENT DEFINITION: DSM-IV (1994)

A. Either (1) or (2).

(1) six (or more) of the following symptoms of **inattention** have persisted for at least 6 months to a degree that is maladaptive and inconsistent with developmental level:

Inattention

- a) often fails to give close attention to details or makes careless mistakes in schoolwork, work, or other activities
 - b) often has difficulty sustaining attention to task or play activities
 - c) often does not seem to listen when spoken to directly
 - d) often does not follow through on instructions and fails to finish schoolwork, chores, or duties in the workplace (not due to oppositional behaviour or failure to understand instructions)
 - e) often has difficulty organising tasks and activities
 - f) often avoids, dislikes, or is reluctant to engage in tasks that require sustained mental effort (such as schoolwork or homework)
 - g) often loses things necessary for tasks or activities (e.g., toys, school assignments, pencils, books, or tools)
 - h) is often easily distracted by extraneous stimuli
 - i) is often forgetful in daily activities
- (2) six (or more) of the following symptoms of **hyperactivity-impulsivity** have persisted for at least 6 months to a degree that is maladaptive and inconsistent with developmental level:

Hyperactivity

- a) often fidgets with hands or squirms in seat
- b) often leaves seat in classroom or in other situations in which remaining seated is expected
- c) often runs about or climbs excessively in situations in which it is inappropriate (in adolescents or adults, may be limited to subjective feelings of restlessness)

- d) often has difficulty playing or engaging in leisure activities quietly
- e) is often “on the go” or often acts as if “driven by a motor”
- f) often talks excessively

Impulsivity

- g) often blurts out answers before questions have been completed
 - h) often has difficulty awaiting turn
 - i) often interrupts or intrudes on others (e.g., butts into conversations or games)
- B. Some hyperactive-impulsive or inattention symptoms that caused impairment were present before age 7 years.
- C. Some impairment from the symptoms is present in two or more settings (e.g., at school [or work] and at home).
- D. There must be clear evidence of clinically significant impairment in social, academic, or occupational functioning.
- E. The symptoms do not occur exclusively during the course of a Pervasive Developmental Disorder, Schizophrenia, or other Psychotic Disorder and are not better accounted for by another mental Disorder (e.g., Mood Disorder, Anxiety Disorder, Dissociative Disorder, or a Personality Disorder).

Code types:

- * Attention-Deficit/Hyperactivity Disorder, Combined Type: if both Criteria A1 and A2 are met for the past 6 months
- * Attention-Deficit/Hyperactivity Disorder, Predominantly Inattentive Type: if Criterion A1 is met but Criterion A2 is not met for the past 6 months
- * Attention-Deficit/Hyperactivity Disorder, Predominantly Hyperactive/Impulsive Type: if Criterion A2 is met but Criterion A1 is not met for the past 6 months.

IDENTIFICATION AND ASSESSMENT

The actual diagnostic label ADHD usually is given by doctors (most commonly paediatricians and child psychiatrists, though sometimes by neurologists) and by psychologists. In most cases, there are several principles and procedures that are usually followed in order to ensure that the best diagnostic decisions are reached.

These include:

- * use multiple sources of information; in addition to evaluating the child directly through test and observations, it is very important to get information from parents, teachers, other caregivers, etc.
- * get information about functioning in different settings
- * assess all dimensions of ADHD
- * get multiple types of data; interviews, observations, rating scales, psychoeducational tests and specific tests for the assessment of attention, impulsivity and activity all add to a comprehensive evaluation of ADHD.

MEDICAL INTERVENTIONS

Pharmacotherapies (medications):

In the US, medication (whether used alone or in combination with educational and psychological/psychiatric interventions) is the most widely used procedure for management of ADHD. Drug treatment has been quite controversial for many years, and it remains so today. Drug use for ADHD in New Zealand is much less widespread.

As early as the 1930s, it was noticed that stimulants improved the functioning of hyperactive children, appearing to calm them down. At one time, this effect was considered to be “paradoxical” in view of the fact that stimulants generally were thought to make normal individuals more active. In fact, one common suggestion for determining if a child was really hyperactive was to give a stimulant drug on a trial basis; if the effect was calming, then the child was considered hyperactive. It is now recognised that normal children also respond positively to stimulant medications with improved attention and concentration for reported normal children and adults in a number of studies. Another major misconception had to do with the effects of puberty on children taking stimulants. This belief was influenced considerably by Laufer, Denhoff and Solomon’s (1957) claim that the problems of hyperactivity “...wane spontaneously and disappear”, indicating that ADHD is only a childhood disorder. While motor activity may decrease, inattention and impulsivity can continue through adulthood. Stimulant medications appear to maintain their usefulness through adolescent and adult years.

How helpful are stimulant medications? Careful research studies, using control groups and “double blind” procedures with placebos so that there is no way for the child, the parents or teachers to determine when a child was not receiving medication, indicate that stimulant drugs have at least positive short-term effects in 60-80% of children diagnosed with ADHD. These effects include improved attention, lessened quantity and intensity of motor activity, improved compliance to parents’ and teachers’ requests, increased appropriate social interaction, higher efficiency at problem solving tasks and increased academic productivity.

How do the drugs work? While this remains a question for further research, it generally is believed that most ADHD children have a neurochemical imbalance in which the neurotransmitters that carry impulses to the brain are affected, resulting in underarousal. The drugs appear to stimulate those parts of the brain involved in transmitting information (especially at the neural synapses) so that the brain functions more efficiently.

While a variety of drugs are used to treat ADHD, stimulant drugs account for the vast majority of prescriptions for ADHD. In New Zealand, methylphenidate hydrochloride (Ritalin) and dextroamphetamine (Dexedrine) are the most commonly used medications. Occasionally, other types of drugs are prescribed (such as Clonidine).

While there can be little doubt about the positive effects of stimulant medications in increasing attention for the majority of children with ADHD, this intervention is

limited in scope; positive effects are not seen in about 20–40% of children with ADHD. More importantly, when the drugs are effective, they merely make it possible for children to behave and to learn more normally in the future. The drugs do not cure poor special skills or negative behaviour patterns which have been learned in the past; nor do they make the child smarter; nor will the child suddenly be able to do math problems which they did not understand because they could not pay enough attention when the concept was taught a year or two earlier. Therefore, it is critical that a comprehensive treatment programme be set in place for the ADHD child.

What about side effects? The two most common side effects of stimulant medications are loss of appetite and difficulties in sleeping followed by irritability and weight loss. Recent research indicates that long-term effects are quite low at normal dosage levels. Stimulant medications can worsen the problems of other disorders (e.g., multiple tic disorders such as Tourettes Syndrome and psychiatric disorders such as depression and schizophrenia). However, there are no indications that the drugs cause these disorders. Usually the side effects are mild and/or transient (passing) and can be managed by reducing the dose level or by switching to another drug.

An important finding from research studies of the last few years is that the ideal dosage level for cognitive (thinking) effects such as attention and memory is substantially lower than that required for changes in activity level. Thus if an assessment of the drug's effects is based only on how much the activity level is decreased, there is a possibility the dosage may be too high to achieve positive effects on school performance.

“Drug holidays”, periods such as weekends and school holidays when the child is not given the medication, often are recommended. The idea is to maximise the effects of the drug when it is given and to minimise the possibility of side effects (such as effects of growth). This generally is a good idea unless the child's behaviour during the time of no medication is such that it interferes with family or other social functioning.

SCHOOL-BASED INTERVENTIONS

Alterations to the typical setting and teaching programme of schools are sometimes required to help children with ADHD at school. Some of the following suggestions may be helpful both at school and at home:

1. Place the child in the least distracting location in the classroom, e.g., in front, away from doors and windows,
2. Provide as much structure and routine as possible. Keep the routine the same from day to day. When unusual events or transitions are to occur, prepare the child for what is to come by explaining the situation and describing appropriate behaviours
3. For individual seatwork, help the child get started and check back now and again to see if she or he is still on track.
4. Make frequent contact with the child; be sure to have his or her attention before speaking.
5. Generally use different types of instructions (e.g., written, verbal, etc.).

6. Adapt work sheets so that there is less information on each page.
7. Break assignments into smaller chunks; give the child extra time to work on assignments.
8. Alternate desk, standing, group and moving around activities throughout the day.
9. Use learning aids such as computers, calculators, tape recorders, etc.
10. Give regular feedback and praise success.

If the child has difficulty

a) getting started

- give a signal to begin working
- present work in small amounts
- explain the purpose of the assignment
- provide immediate feedback and encouragement

b) staying on task

- remove all distractions from the work area
- place child next to a peer who can help immediately
- employ colour to highlight rote, repetitive work
- increase the frequency of rewards
- encourage eye contact
- build success in to the task
- offer variety of tasks

c) staying seated

- make sure child understands your expectations
- give a reward any time the child is seated
- take a photo of your child sitting appropriately and cue the child, when necessary, by pointing at the photo

d) following directions

- give short, concrete directions
- provide examples
- repeat directions
- have child repeat and explain the instructions before beginning
- team up with a peer

Several major models for school-based interventions have been used frequently:

1. stimulus reduction, which involves decreasing or eliminating distractors in the environment
2. behaviour modification, including systematic rewards as well as non-aversive punishments such as time-out and response cost programmes.
3. cognitive behaviour modification which attempts to make children consciously aware of their own thinking processes and strategies and to give them responsibility for their own reinforcement. It can include self-monitoring, problem-solving, etc.
4. social skills programmes

PARENT/FAMILY ISSUES

Raising children is an exciting, trying, fulfilling, humbling experience for parents in the best of situations!! For families with a child with ADHD, the task may be particularly difficult. The child may not be as rewarding as other children, the pressure is more constant, the child needs more supervision, the house is in disarray, family outings may be embarrassing, getting dressed and ready can be a nightmare, and so on.

Some parents and other family members can benefit from counselling/therapy. Child management issues frequently are topics of concern, but all kinds of other normal problems/issues of family life may be harder. Many parents find it very helpful to get their child involved in activities outside the home - sports can be one good outlet for the child. In some locations, such as throughout the Waikato, parents of children with ADHD have formed support groups that seem to have great benefit.

SOME HELPFUL READING:

Available from Public Library and local bookshops:

- * Hidden Handicap by Gordon Serfointein
- * Every parent by Matthew Sanders
- * Positive Parenting by Kate Birch

Available through ADHD Association for \$20.00

- * Understanding ADD by Christopher Green and Kitt Chee

The information provided in this handout is, in part, an adaptation of the findings of a special task force appointed in 1988 by the Education Department of the State of Virginia in the United States. Members were chosen to represent various professional disciplines (e.g., paediatrics, child psychiatry, clinical psychology, etc.) as well as parents of ADHD children and staff of the Department of Education. Information also was drawn from: a) Silver, L.B. (1990). *ADHD: Attention Deficit-Hyperactivity Disorder and Learning Disabilities-Booklet for the classroom teacher*. NJ: Ciba-Geigy; b) Braswell, L., & Bloomquist, M.L. (1991). *Cognitive-behavioral therapy with ADHD children: Child, family and school interventions*. NY: Guilford Press; c) Waikato ADHD Support Group handouts; and, d) *Attention Deficit Hyperactivity Disorder: A guide to identification and management*, prepared by the Learning Assessment Centre, Professional Psychology Unit, Department of Psychology, University of Auckland.

APPENDIX J

Handouts for parent group sessions STEP 2

????? WHAT'S THE PROBLEM ??????

I. Target Behaviour(s)

- * definition of the behaviour of concern
- * severity
 - frequency (number of occurrences for certain period of time)
 - duration (average length of episode, with a range of times)
 - latency (average or usual amount of time delay in responding)
 - magnitude (expressed in appropriate terms, e.g.: volume of voice, audible outside the house with all the windows shut; speed; force; etc.)
- * functional alternatives - what could or should the child do as an alternative to the behaviour and can he or she perform that behaviour

II. History

- * onset - when did it first occur?
- * onset events - what significant events occurred around that time
- * cycles - does it occur regularly or does it come and go

III. Antecedent conditions (what happens before)

- * places (and likelihood of occurrence)
- * times of day, scheduled or unscheduled events commonly associated with the behaviour (before, after or at)
- * setting events - are there other relevant events, times or conditions that may be sporadic, infrequent or not immediately antecedent that seem to be associated with the behaviour, e.g., whenever the child is physically ill, his rate of hitting seems higher.

IV. Consequences (what happens after)

- * what happens after the behaviour has occurred, e.g., what is said, done, give/taken, started/stopped by the parent and,
- * what is the child's usual response to the consequence, e.g., she runs away.

V. Analysis of meaning

Does the behaviour seem to serve the child as a means of performing some other function?

Examples include:

- * getting food or drink/getting objects or materials
- * overriding denial of requests for things, attention or activities
- * avoiding performance demands or ending performance demands
- * avoiding interactions with others such as parents, siblings, strangers, peers, etc.
- * terminating interactions with others
- * getting attention from others
- * recapturing attention lost to someone else
- * diverting attention from some other behaviour
- * responding to possible aggression
- * giving or seeking affection
- * initiating an activity
- * getting help with a problem
- * refusing to give, share, accept
- * agreeing/disagreeing with another person
- * playing/asking to play with another person
- * expression of emotion, e.g., fear, anger, confusion, discomfort, joy, pleasure,
- * self-regulation or entertaining self
- * influencing the behaviour of others
- * etc. etc.

VI. Priority for treatment

What are the consequences of not doing something about the behaviour of concern?

VII. Effects of the treatment on other behaviour

Possible undesirable effects that need to be taken into account.

SOCIAL LEARNING

- A. Most behaviour is learned.
- * people learn their behaviour from other people
 - * people teach, train, and change each other's behaviour
 - * parents and teachers teach, train, and change children
 - * adults teach, train and change other adults
 - * children teach, train and change their parents!
- B. Social learning is concerned with how people teach people.
- C. It is important that you know how your behaviour relates to and influences your child's behaviour and how your child's behaviour affects your behaviour.
- * people are often unaware of why they behave as they do
 - * both prosocial and problem behaviour are learned
- D. Most people, except parents, are usually trained for their jobs at which they work. Parents are just expected to know how to raise children successfully.
- * parents should have the opportunity to learn to use some of the methods that have been developed for teaching children
 - * parents can learn how to establish behaviours in their children that will bring them success in school and life
- E. Make use of social learning principles to help your child learn appropriate behaviours.

Potential negative effects of an over-reliance on punishment

- A. Extensive use of punishment sets up escape/avoidance behaviours that may be more harmful than the behaviour being punished.
- B. Extensive punishment establishes emotional reactions, such as anxiety for the child.
- C. Punishment also may make you feel guilty or upset if you punished because of anger or frustration.
- D. Punishment will probably reduce non-compliance for a while, however the behaviour is likely to reappear shortly after punishment occurs.
- * punishment does not eliminate the child's motivation for engaging in a behaviour
 - * for punishment to be most effective, the behaviour has to be punished every time.
- E. Punishment loses its effectiveness with frequent and continued use, so more and more severe punishments are required.

- F. If physical punishment is overused, you may provide a model of aggression for the child.
- G. You can become less effective because:
- * your value as a positive influence on the child decreases since you're always associated with punishment
 - * your control through punishment weakens as the punishment loses its effectiveness through too much use.

DIFFERENTIAL ATTENTION

Behaviour is maintained, changed or shaped by the effects (consequences) of the behaviour.

- A. These consequences either strengthen (reward or reinforce) or weaken the behaviour.
- B. To strengthen behaviour, reinforce or reward it.
- C. A behaviour can be weakened by no longer rewarding it.

Based on positive reinforcement and attention, the following are critical to improving your child's behaviour.

- A. Focus on strengthening a desirable behaviour that is likely to be rewarding to your child and that at the same time will compete with the undesirable behaviour that you are weakening and eventually takes its place (the child can't do both behaviours at the same time).
- B. If you pay attention to your child when your child is being 'good' (i.e., compliant), then it is more likely that she or he will engage in that behaviour more frequently.
- C. At the same time, if you don't give your child attention (i.e., if the child is ignored) when he or she is engaging in inappropriate behaviour, then these behaviours are not as likely to occur in the future and will eventually stop.
- * ignoring is one method that eventually eliminates a behaviour since the child learns that there is absolutely no payoff for engaging in the behaviour
 - * for ignoring to be effective, the parent must try to ignore the behaviour every time it occurs
 - * sometimes when parents start to use ignoring there may be an initial burst of worse behaviour: this is normal as the child is testing the limits; the parents have to try and be consistent
- D. The opposite is also true.

- * If you ignore your child when he or she is engaging in appropriate behaviour, then you will get less appropriate behaviour
- * “catch your child being good”; too often ‘good’ behaviour can be taken for granted
- * paying attention to your child (watching, discussing, smiling, nagging, yelling, etc.) when she or he is displaying inappropriate behaviour will make that behaviour more likely to occur in the future.
- * undesirable behaviour can be accidentally or unintentionally rewarded by occasionally giving in
- * sometimes the parent is rewarded for nagging, criticising, yelling, etc. because the child briefly stops the inappropriate behaviour

The ultimate goal of parental reinforcement is for the appropriate child behaviours that are reinforced to eventually become self-reinforcing to the child; in this way, the child will gain control over his or her own behaviour.

- A. Reward should follow immediately after good behaviour.
- B. Be specific; tell your child exactly what behaviour you’re reinforcing/rewarding.
- C. Rewards can be given continuously or intermittently (like a bonus).
 - * in the early stages of learning a task, reward every correct response
 - * as the behaviour becomes stronger, require more and more correct responses before rewarding the behaviour
 - * to get it going, reward every time; to keep it going, reward intermittently
- D. Social reinforcers (e.g., parental praise) are in contrast to material rewards (e.g., money, treats).
 - * social rewards are more versatile than material rewards
 - * social rewards are always available as immediate consequences of good behaviour, while this is not necessarily the case with material rewards
- E. Use appropriate rewards; they should be realistic, rewarding to the child, and of an appropriate size relative to the behaviour.
- F. Shaping is useful when dealing with complex behaviours
 - * when the child is learning a new behaviour (particularly a complicated one), he or she should be rewarded for each small step along the way that comes close to the goal
 - * if the task is too big, the child may have to wait too long for the reward
 - * shaping sets the child up for success
 - * it requires patience
- G. If the behaviour you desire is relatively complex, break it down into the smaller units or steps necessary to achieve that behaviour. Examples at home include some of the following:

- * Rather than say “Pick up all the toys”, say, “Put the three blocks in the box” or “Put the cars in the box”, etc.
 - * Rather than say “Make your bed”, say, “Pull the sheet up first”, “Now pull up the blanket”, etc.
- H. Reciprocity refers to the idea that in terms of interactions among family members “You get what you give”, positive and negative.

(ref: Forehand and McMahon, 1981)

COMPLIANCE

Effective Punishment

- A. Punishment is an event that occurs following behaviour and that weakens the likelihood of that behaviour occurring again. It involves the presentation of negative consequences or the withdrawal of reinforcers/rewards.
- B. It is generally not the preferred way of interacting with the child.
- C. Most of the rules regarding effective punishment are similar to those for reinforcement.
- * it is given immediately
 - * it relies on taking away reinforcers and provides a clear method for earning them back
 - * it usually includes a verbal warning signal; this eventually works as a cue and helps develop internal controls so that external controls are not needed as often
 - * it is carried out in a calm, matter-of-fact way and consistently
- D. Time-out can be a useful strategy as a short time out from positive reinforcement



TEN MYTHS THAT PERPETUATE CORPORAL PUNISHMENT

84% of a survey of Americans agreed that it is sometimes necessary to give a child a good hard smack. Almost all parents of toddlers act on these beliefs. There are many reasons for the strong support of smacking - most of them are myths! Read on...

MYTH 1: Smacking works better than...

There has been a huge amount of research on the effectiveness of corporal punishment of animals, but remarkably little on the effectiveness of smacking children, probably because it is assumed that it is effective. In fact, what little research there is on the effectiveness of corporal punishment of children agrees with the research on animals, which shows that punishment is not more effective than other methods of teaching and controlling behaviour. Some studies show that it is less effective.

The reality is that no method works all the time with a toddler. Parents think that smacking is a magic charm that will cure the child's misbehaviour. It is not. There is no magic charm. It takes many interactions and many repetitions to bring up children. Some things work better with some children than with others.

Parents who favour smacking can turn this around and ask, If smacking doesn't work any better, isn't that the same as saying that it works just as well? So what's wrong with a quick slap on the wrist or bottom? There are at least three things that are wrong:

- * smacking becomes less and less effective over time and when children get bigger, it becomes difficult or impossible.
- * for some children, the lessons learned through smacking include the idea that they only need to be good if Mum or Dad is watching or will know about it.
- * there are a number of harmful side effects, such as greater chance of the child growing up to be depressed or violent. Parents don't see these side effects because they usually show up only in the long run.

MYTH 2: Smacking is needed as a last resort

Many people who are opposed to smacking tend to think that it may be needed sometimes when all else fails. However there is no scientific evidence to support this belief. Take the example of a child running out into the street. A lot of people think that smacking is appropriate then because of the extreme danger, however the only thing it may do is relieve the parents' own tension and anxiety. The only physical force needed is to pick up the child and get him/her out of danger and then to explain the danger. If smacking is to be done at all, the "last resort" may be the worst; parents are usually very angry by that time and can act impulsively, and the whole situation may escalate.

MYTH 3: Smacking is harmless

When someone says, "I was smacked and I'm OK", he or she is arguing that smacking does no harm. However this is contrary to almost all available research. One reason the harmful effects are ignored is because many of us are reluctant to admit that our parents did something we didn't like or that as parents we have been doing something we don't like with our children. The most important reason may be that it is difficult to see the harm right away. The delayed reaction and the small proportion seriously hurt are the same reasons the harmful effects of smoking were not perceived for so long. In the case of smoking, the research shows that a third of heavy smokers die of lung cancer or other smoking-induced disease. That of course means that two-thirds of heavy smokers do not die of these diseases. So most heavy smokers can say, I've smoked more than a pack a day for 30 years and I'm OK. Similarly, most people who were smacked can say my parents smacked me and I'm not a wife-beater or depressed.

MYTH 4: One or two times won't cause any damage

The general evidence indicates that the greatest risk of harmful effects occurs when smacking is very frequent. However that does not necessarily mean that smacking one or two times is harmless.

MYTH 5: Parents can't stop without training

There is no evidence that it takes some extraordinary training to be able to stop smacking. Even without parent training programmes, many parents are already using a wide variety of behavioural management strategies. The problem is that some also use smacking. In most cases, parents only need the patience to keep on doing what they were doing to correct misbehaviour and leave out the smack

MYTH 6: If you don't smack, your child will be spoiled or run wild

Non-spanking parents treat the child in ways that tend to bond the child to them and avoid acts that weaken the bond. They tend to use more rewards for good behaviour, greater warmth and affection and fewer verbal assaults on the child. They tend to do more explaining and reasoning.

MYTH 7: Parents smack rarely or only for serious problems

Contrary to this myth, most parents who smack tend to use this method of discipline for almost any misbehaviour. Many do not even give the child a warning.

MYTH 8: By the time a child is a teenager, parents have stopped

Based on a follow up National Family Violence Survey conducted in the United States in 1985, more than half of the parents of 13- to 14-year-old children smacked their children in the previous 12 months. The percentage drops each year as children get older, but even at age 17, 1 out of 5 parents (20%) may still be smacking their child.

MYTH 9: If parents don't smack, they will verbally abuse their children
The scientific evidence is exactly the opposite; those who did the least smacking also engaged in the least verbal aggression.

MYTH 10: It is unrealistic to expect parents to never smack
It is no more unrealistic to expect parents to never smack a child than to expect that husbands should never hit wives, or that no one should go through a stop sign, or that a supervisor should never hit an employee.

Parenting - our job is to help children learn to live without us. It is a short-term commitment - a time when children pass through our lives and on to a life of their own.

Some other discipline techniques that don't work:

1. **Embarrassing/humiliating:** Embarrassing someone is a cheap shot.
2. **Ordering**
3. **Taking away favoured things:** We can threaten to take away hobbies, make them stop sports or dancing, or take away the child's bike or the television. Often things are taken away for extended periods, long after the child will remember what it was taken away for or sometimes that it has been taken away. Many times it is impossible to live up to the threats we have imposed on the child and he/she knows it! This makes the parent look ineffectual and the child loses respect.

There has to be balance and fairness. For example, I like reading, it's one of my hobbies. What if my partner suddenly decided that I needed to do the ironing right now and told me that I couldn't read for pleasure until I did it to his satisfaction? Do you think that I would drop my reading and do the ironing? Not likely!

4. **Labelling:** Children live up to their labels. When we tell children they are lazy, they get lazier. When we tell them they are slow, they get slower. Children believe what they hear about themselves.
5. **Arguing and power struggles:** When we argue with our children, they realise that they have us hooked. They are getting full attention, and arguments usually go nowhere. Getting into arguments with children is usually non-productive.

6. Fussing/nagging
7. Threatening: Parents lose their credibility when they threaten to do things that they never intend to do.
8. Repeating commands: Parents need to “mean it” the first time they say a command.
9. Pleading/begging
10. Scaring
11. Inconsistency
12. Losing your cool: When adults resort to screaming, saying things they don’t mean, falling apart, or losing their cool, children react in many different ways; some are afraid, some are insecure, lose respect for parent, worsen their behaviour.
13. Being vague: For example, using statements such as “be good”, “straighten up”.
14. Allowing dangerous or destructive behaviour to continue
15. Laughing at misbehaviour
16. Rewarding misbehaviour
17. Allowing the child to manipulate the adult
18. Trying to talk a child out of wanting what he or she wants
19. Expecting the child to read the parent’s mind: Children need to be told very clearly and precisely what is expected of them, especially in new situations.
20. Putting the child on a guilt trip

INVENTORY FOR CHILD'S STRENGTHS AND WEAKNESSES

Strengths	Weaknesses
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10

PARENT CHARACTERISTICS

Strengths	Weaknesses
1	1
2	2
3	3
4	4
5	5
6	6
7	7
8	8
9	9
10	10

STEP 3**PAYING ATTENTION TO YOUR CHILD'S GOOD PLAY BEHAVIOUR**

1. Set aside about 15 to 20 minutes every day for a session with your child. This should be at a time and in a place where you are isolated from the rest of the family and can guarantee no major interruptions. If the phone rings, for example, let it ring or even better would be to take it off the hook or put the answerphone on. Try to have arrangements for other children so they will not interrupt this session.
2. Select a room for play where there will be least concern if things get ruined or broken; water may be spilled, clay smeared or toys dropped or broken, so a basement or kitchen floor or table would be best. Many parents select the area and then spread out a large plastic tablecloth, paper or shower curtain.
3. The child decides what to do (within broad limits) and is encouraged to choose activities using building, fantasy and/or activity toys (rather than highly structured games). Some suggestions include: family of puppets; doll family and house box for family and doll furniture; bowl for water; crayons, paints, felts, etc.; drawing paper; blackboard, chalk and eraser; cups and saucers; tinker toy or similar construction toys.
4. What to tell the child. You don't need to go into a long explanation with your child. You may simply say that you want to spend more time with him or her or just have some fun. There is usually very little difficulty in getting children to join in; most of the time, children enjoy the sessions and look forward to them.
5. What does the parent do. Firstly, relax and enjoy! The role of the parent in the play session is to establish an atmosphere of free play and acceptance for the child. You set the stage by setting the time and a few basic rules and your child takes charge of the rest; what your child does with the toys and what he or she says in the session are really up to him or her. It is the child's special time to relax and enjoy your company. Try to remember:
 - NO criticism
 - NO questions or commands
 - NO suggestions, advice or persuasion
 - NO interruptions or interference
 - NO information, unless asked by child
 - NO teaching, preaching or moralising

6. After watching your child play, begin to describe (out loud) what your child is doing; this is done to show your child that you are interested in what he/she is doing. Thinking of you as a sports commentator might help! Occasionally give your child positive statements of praise or approval about what you like about his or her play. Some suggestions are provided at the end of this handout.

7. There are very few restrictions on the child's activity in the play session, however it may be necessary to set up a couple of basic rules/limits before starting the session; an example of a limit might be "no hitting/hurting parent." If the child breaks a limit, you should point out that this particular behaviour is not allowed. If this is not enough and the behaviour occurs a second time, warn the child that the play session will end if it occurs again. The next occurrence ends the session immediately with something like, "Our play time is over now but we can come back again tomorrow."

SUGGESTIONS FOR GIVING POSITIVE FEEDBACK AND APPROVAL

* Verbal:

I like it when you...

It's nice when you...

You sure are a big girl/boy for...

That was terrific the way you...

Great job!

Terrific!

Choice!

Fantastic!

Fab!

Wow!

Wait till I tell your mum/dad how well you. . .

You did that all by yourself, way to go!

I always enjoy it when we . . . like this



Nonverbal::

Hug

Pat on the shoulder

Placing arm around the child

Smiling

Kiss

Giving a thumbs-up sign

A wink

Child-Directed Interaction

RULE	REASON	EXAMPLES
1. <i>Describe</i> appropriate behaviour.	<p>Allows child to lead</p> <p>Shows child you're interested</p> <p>Teaches concepts</p> <p>Models speech</p> <p>Holds child's attention</p> <p>Organises child's thoughts about play</p>	<p>That's a red block.</p> <p>You're making a tower.</p> <p>You drew a smiling face.</p> <p>The cowboy looks happy.</p>
2. <i>Imitate</i> appropriate play.	<p>Lets child lead</p> <p>Approves child's choice of play</p> <p>Shows child you are involved</p> <p>Teaches child how to play with others (e.g., basis of taking turns)</p> <p>Tends to increase child's imitation of what to do</p>	<p>Child: I'm putting baby to bed.</p> <p>Parent: I'll put sister to bed, too.</p> <p>Child: I'm making a sun in the sky.</p> <p>Parent: I'm going to put a sun in my picture too.</p>
3. <i>Reflect</i> appropriate talk.	<p>Doesn't control the conversation</p> <p>Shows child you're really listening</p> <p>Demonstrates acceptance and understanding of child</p> <p>Improves child's speech</p> <p>Increases verbal communication</p>	<p>Child: I made a star.</p> <p>Parent: Yes, you made a star</p>
4. <i>Praise</i> appropriate behaviour	<p>Cause the behaviour to increase</p> <p>Let child know what you like</p> <p>Increases child's self-esteem</p> <p>Adds to warmth of the relationship</p> <p>Makes <i>both</i> parent and child feel good!</p>	<p>That's terrific counting!</p> <p>I like the way you're playing so quietly.</p> <p>You have wonderful ideas for this picture.</p> <p>I'm proud of you for being polite.</p> <p>You did a nice job on that building.</p> <p>Your design is pretty.</p> <p>Thankyou for showing the colours to me.</p>

RULE	REASON	EXAMPLES
<p>5. <i>Ignore</i> inappropriate behaviour (unless it's dangerous or destructive).</p> <p>a) don't look at child, smile, frown, etc.</p> <p>b) Be silent.</p> <p>c) Ignore <i>every</i> time.</p> <p>d) Expect behaviour to increase at first</p>	<p>Avoids increasing poor behaviour</p> <p>Decreases some behaviours</p> <p>Helps child notice difference between your responses to acceptable and not acceptable behaviour</p>	<p>Child: ("winds up" parent and picks up toy)</p> <p>Parent: (ignores "wind up"; praises picking up)</p> <p>Child: (hits parent)</p> <p>Parent: (GAME STOPS. This can't be ignored)</p>
<p>6. <i>Don't give commands.</i></p>	<p>Doesn't allow child to lead</p> <p>Can cause unpleasantness</p> <p>Child obedience will be taught later</p>	<p><i>Indirect</i></p> <p>Will you hand me that paper?</p> <p>Could you tell me the alphabet?</p> <p><i>Direct</i></p> <p>Look at this.</p> <p>Please tie your shoe/come here.</p>
<p>7. <i>Don't ask questions.</i></p>	<p>Leads the conversation instead of following</p> <p>Many are commands or require an answer</p> <p>May seem like you aren't listening or disagree with child</p>	<p>That's a blue one, right?</p> <p>What colour is this?</p> <p>Are you having fun?</p> <p>You want to play with the wastebasket?</p>
<p>8. <i>Don't criticise.</i></p>	<p>Doesn't work to decrease unacceptable behaviour</p> <p>Often increases the criticised behaviour</p> <p>May lower the child's self-esteem</p> <p>Creates an unpleasant interaction</p>	<p>You're being naughty.</p> <p>I don't like it when you talk back.</p> <p>No, honey, that's not right.</p> <p>That design is ugly.</p>

PRACTICE POSITIVE PARENTING THROUGH SPECIAL PLAYTIME: EXAMPLE

Directions: Set aside 15 to 20 minutes a day to interact with your child for special time. (Occasionally you may be too busy to do the special playtime on a given day.) Tell your child, “It’s time for the special play time.” Help your child select several favourite toys. Go to a special place in your home and play. You should practice describing, praising, and touching and try to avoid questions, commands and criticisms. Keep track on this form of when you did the special playtime. Write your comments about how well it went. Comments should focus on your thoughts about your progress with describing, praising and touching the child and your observations of how your child reacted.

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Did the child’s game (yes/no)	Yes	Yes	No	Yes	No	Yes	Yes
Comments about special play time	She seemed confused by my behaviour. I had a hard time increasing describing, praising and touching.	She liked it. I still had a hard time increasing those positive behaviours	Forgot.	She liked it. She seems to think it is special. I’m still asking too many questions.	Too busy.	She liked it. I’m getting better at increasing positive behaviours.	

PRACTICE POSITIVE PARENTING THROUGH SPECIAL PLAYTIME

Directions: Set aside 15 to 20 minutes a day to interact with your child for special time. (Occasionally you may be too busy to do the special playtime on a given day.) Tell your child, "It's time for the special play time." Help your child select several favourite toys. Go to a special place in your home and play. You should practice describing, praising, and touching and try to avoid questions, commands and criticisms. Keep track on this form of when you did the special playtime. Write your comments about how well it went. Comments should focus on your thoughts about your progress with describing, praising and touching the child and your observations of how your child reacted.

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Did the child's game (yes/no)							
Comments about special play time							

STEP 4
ADULT SELF-EVALUATION OF THOUGHTS FORM

Child's name: _____ Parent's name: _____ Date: _____

Directions: Listed below are a variety of thoughts that parents may have about their children and themselves. Read each thought and indicate how frequently that thought typically occurs for you over an average week. Add up all the numbers for a total.

1	2	3	4	5
Not at all	Sometimes	Moderately often	Often	All the time

I. *Attributions about the child*

- _____ A. This child is a brat.
- _____ B. This child does it intentionally.
- _____ C. This child is the cause of all the family's problems.
- _____ D. This child is just trying to get attention.

II. *Attributions about self/others*

- _____ A. It's my fault that this child is that way.
- _____ B. If I wasn't such a poor parent, this child would be better off.
- _____ C. It's his/her (other parent's fault) that this child is that way.
- _____ D. If he/she (other parent) wasn't such a poor parent, this child would be better off.

III. *Beliefs/expectations about the child*

- _____ A. This child's future is bleak. When he/she grows up, he/she will probably be irresponsible, a criminal, school dropout, etc.
- _____ B. This child should behave like other children. I shouldn't have to teach this child how to behave.
- _____ C. This child must do well in school, sports, scouts, etc. It is unacceptable if this child does not do as well in these activities as any other child.
- _____ D. This child is defective. This child has many problems. This child does not fit in with other children.

IV. *Beliefs/expectations about self and/or family*

- _____ A. Our family is a mess.
- _____ B. I can't make mistakes in parenting this child.
- _____ C. I give up. There is nothing more I can do for this child.
- _____ D. I have no control over this child. I have tried everything.

V. *Beliefs/expectations about medications*

- _____ A. He/she needs medications. He/she can't function without them.
- _____ B. Medications are the answer. The child's problems will be greatly diminished or gone when he/she is on medications.

VI. *Beliefs/expectations about other interventions*

- _____ A. Therapy will fix or cure this child.
- _____ B. My child is the focus of therapy.
- _____ C. Therapy will not really help.

ADAPTIVE ATTRIBUTIONS AND BELIEFS REGARDING ADHD

Attributions

- I. Trait attribution: counters
 - A. Many problems are out of this child's control.
 - B. It doesn't matter whose fault it is; what matters are the solutions to the problems.
 - C. It's not just this child. I also play a role in the problem.

- II. Self-blame attribution: counters
 - A. It's not my fault; this child plays a role too.
 - B. It doesn't matter whose fault it is; what matters are the solutions to the problems.

Beliefs/expectations

- I. About the child: counters
 - A. I'm being irrational. I have no proof that this child will continue to have problems. I need to wait until the future.
 - B. My belief that I have no control over this child might contribute to the problem. Many things are in my control. This belief gives me the excuse not to control this child.
 - C. I can't expect this child to behave. This child needs to be taught how to behave more appropriately.
 - D. I need to accept this child for whoever he/she is. It's OK if this child is not great at school (kindy). I need to focus on this child's strengths and not on his/her weaknesses.

- II. About self/family (classroom): counters
 - A. We all have a part in the problem. It's not just this child.
 - B. I'm going to make mistakes. It's natural to make mistakes. This child is more challenging than others.
 - C. I have to parent (teach) this child now or later. I have no choice not to parent (teach) this child now. I need to think of new ways to parent (teach) this child. If I don't parent (teach) this child now, things might get worse.

- III. About medications : counters
 - A. Medications may be one component of this child's intervention, not the answer.
 - B. Medications with therapy and other interventions work best.
 - C. I have to help this child so that he/she does not attribute his/her improvements only to the medications, rather than to other factors in his/her control.

- IV. About other interventions: counters
 - A. No one can fix or cure this child, but we learn better how to adapt to the problems.
 - B. The therapist will guide us to learn how to better cope with our problems.
 - C. I will need to be equally involved in the intervention. I need to change too.

ADULT SELF-EVALUATION OF BEHAVIOUR FORM

Child's name: _____ Parents name: _____ Date: _____

Directions: Listed below are a variety of behaviours that parents and children may engage in. Read each one and indicate how frequently that behaviour typically occurs for you and/or your child over an average week. Add up all the numbers for a total.

1	2	3	4	5
Not at all	Sometimes	Moderately	Often	All the time
		Often		

- I. *Problematic commands:* Telling the child what to do ineffectively.
- ____ A. Vague commands - not specifying exactly what child is to do (e.g., shape up, knock it off, etc.)
- ____ B. Question commands - asking a question in attempt to gain child's compliance (e.g., would you please pick up your toys?, etc.)
- ____ C. Rationale commands - explaining why the child needs to comply (e.g., you need to get dressed or we will be late, etc.)
- ____ D. Multiple commands - telling the child to do too many things at once (e.g., pick up your toys, get dressed and come to the table for lunch)
- ____ E. Frequent commands - repeating commands to the child and not following through with consequences when the parent says he/she will.
- II. *Negative reinforcement:* Adult and child use aversive means to control one another; it works and therefore is reinforced and these behaviours are repeated.
- ____ A. Child, giving in and allowing child to "get own way" because he/she is so difficult.
- ____ B. Adult - yelling, threatening, etc. until child gives in and/or complies.
- III. *Low levels of positive reinforcement:*
- ____ A. Ignoring and/or not attending when child is behaving neutrally or appropriately.
- IV. *Inadvertent reinforcement of problem behaviour:*
- ____ A. Giving child attention and accidentally reinforcing problem behaviour (e.g., attention for disruptive behaviour, whining, somatic complaints, when child says it's too hard, etc.)
- V. *Poor parental monitoring of child:*
- ____ A. Not sure what child is doing or where child is when away from home
- VI. *Ineffective discipline:*
- ____ A. Having problems controlling the child's behaviour.
- ____ B. Yelling and threatening too much.
- ____ C. Being inconsistent in disciplining approaches.
- VII. *Overcontrolling:*
- ____ A. Telling the child what to do most of the time.
- ____ B. Not allowing the child to solve his/her own problems.

ADAPTIVE BEHAVIOURAL INTERCHANGES BETWEEN ADULTS AND CHILDREN

- I. *Commands:*
Specific, one-step, 10 words or less (e.g., pick up that shirt, get dressed now, etc.)

- II. *Positive reinforcement:*
Pay attention to and reward neutral and positive behaviour.

- III. *Ignoring:*
Don't pay attention to mild attention seeking behaviour (e.g., whining, pouting, etc.)

- IV. *Don't give in:*
Don't allow child to get his/her way by escalating his/her aversive behaviour.

- V. *Socratic parenting/teaching:*
Help children use problem-solving (i.e., plans) to solve their own problems and learn self-control. Use problem solving with the child in a collaborative way together). Model problem solving for the child.

- VI. *Effective discipline:*
Use time-out, reinforcement procedures, contracts, and contingencies for child-management.

- VII. *Monitoring:*
Develop specific rules and regulations about what the child can do and where the child can be. Check up on the child and provide consequences if rules and regulations are carried out or if they are broken.



GIVING EFFECTIVE COMMANDS (EFFECTIVELY)

1. All commands are not equal, e.g., "Set the table" generally has a low chance of eliciting child compliance whereas "Please turn on the t.v." has a much higher chance.
2. Issue instructions that you intend to follow through on.
3. Commands should be relatively simple and clear; they should take the form of direct statements, e.g., "Put the blocks on the table" or "Hand me the crayon."
 Try to avoid:
 - * indirect commands, e.g., "Be good"
 - * non-specific statements, e.g., "Let's do this together"
 - * questions, e.g., "Would you like to sit down?"
 - * rationale-type commands, e.g., "You need to get dressed because we have a doctor's appointment at 1.00pm and if you don't get dressed now, we will be late."
4. Commands should be stated positively - i.e., what to do versus what not to do, e.g., "Draw on the paper" versus "Stop drawing on the table."
5. Commands and instructions should be age- (or developmentally) appropriate.
6. Commands should require only one behaviour for the child to perform.
 Try to avoid:
 - * commands strung together, e.g., "Sit down and find the red car and put it in the garage."
 - * global commands that encompass many specific behaviours, e.g., "Clean up the table."
7. If possible, give commands in the absence of outside distractions and while making eye contact with the child to increase the likelihood that he or she is attending to the instruction.
8. Where appropriate have the child repeat the instruction.

PRACTICE POSITIVE ATTENTION AND REINFORCEMENT: EXAMPLE

Directions: Try to increase positive attention and reinforcement of your child (e.g., praising, touching, interacting, talking, smiling, etc.), decrease negative interactions (e.g., criticisms, unnecessary commands, unnecessary questions, etc.) and increase ignoring of mild behavioural problems. Keep track of the frequency of positive attention, negative interactions and ignoring behaviours.

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Frequency of positive attention and reinforcement	\\\\\\\\\ \\	\\	\				
Frequency of negative interactions	\\	\\\	\\\\\				
Frequency of ignoring	\\\\\\\\\ \\		\\\				

PRACTICE POSITIVE ATTENTION AND REINFORCEMENT

Directions: Try to increase positive attention and reinforcement of your child (e.g., praising, touching, interacting, talking, smiling, etc.), decrease negative interactions (e.g., criticisms, unnecessary commands, unnecessary questions, etc.) and increase ignoring of mild behavioural problems. Keep track of the frequency of positive attention, negative interactions and ignoring behaviours.

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Frequency of positive attention and reinforcement							
Frequency of negative interactions							
Frequency of ignoring							

REINFORCEMENT OF SPECIFIC BEHAVIOUR: EXAMPLE

Directions: Put a smiley face in the box if the behaviour occurred or task was completed. Put a frowning face in the box if the behaviour did not occur. Always praise your child each time that he/she gets a smiley face. Give out rewards on a daily or weekly basis as indicated below - these should be worked out beforehand.

Behaviour	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	Sunday
Up and dressed by 8.00am							
Help set table for dinner							
Feed dog							
In bed by 7.00pm with lights out							

Total number of smiley faces	2	3	2	4	4		
------------------------------	---	---	---	---	---	--	--

Rewards: Daily

1-2 smiley faces = extra bedtime story

3 smiley faces = special snack

4 smiley faces = special time with parent

Weekly

5-14 smiley faces = time with parent

15-21 smiley faces = video of choice

22-28 smiley faces = new model toy



IDEAS FOR REWARDS (what would your child like??)

favourite dessert

favourite meal

special snack

stamps

small toys

sports equipment



camping in the back yard

rent video tape

stickers

extra attention/special

time

special privileges

special t.v. privileges

stay up late

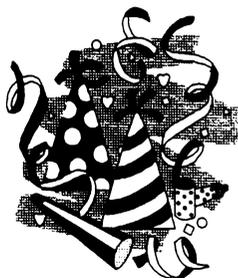
have a friend over to play, for dinner or to stay the night



go to a movie

trip

go on a special



small party

STEP 7
HOME SITUATIONS QUESTIONNAIRE-REVISED

Child's Name _____

Does your child have problems paying attention, concentrating or behaving appropriately in any of these situations? If yes, indicate how severe these problems are.

<i>Situations</i>	<i>Yes/No</i>		<i>If yes, how severe?</i>							<i>Severe</i>	
	<i>(circle one)</i>		<i>Mild</i>								
	Yes	No	1	2	3	4	5	6	7	8	9
While playing alone											
While playing with other children											
Mealtimes											
Getting dressed											
While watching t.v.											
When visitors are in your home											
When visiting someone else											
At church (if applicable)											
In supermarkets, shops, restaurants											
When asked to do chores at home											
During conversations with others											
While in the car											
When the other parent is at home											
When asked to do special projects											

No. problems:

Mean severity:

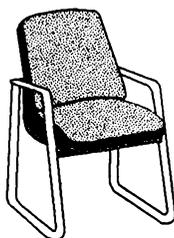
(Reprinted here for reference purposes)



TIME-OUT (from reinforcement)

Identify one or two problems areas or especially resistant types of non-compliance to become targets for time-out.

After you make a request and your child fails to comply within approximately five seconds, adopt a firm facial expression and body posture and issue a firmly stated warning, “If you don’t do as I asked, then you are going to sit in that chair”. If after five more seconds your child does not comply, announce firmly, “You didn’t do as I asked, so now you must sit in the chair” (i.e., as illustrated in this example, you label the rule-violation which was ‘not doing what you asked’).



All attempts by your child to avoid the chair are ignored. The child is escorted to the chair and you say, “You are to stay in that chair and remain quiet until I tell you when you can come out”. The amount of time (minutes) is usually equivalent to the child’s age (e.g., four years old = four minutes).

After this time and when the child is quiet, approach the chair and reissue the command or request. If the child is non-compliant, reissue the command or request and use the above procedure until compliance is achieved. When compliance is achieved, thank the child in a neutral tone (however, no other rewards are given). A few moments later, try to find an opportunity to praise and reward the child for some other compliant behaviour.

If the child leaves the chair, you may need to use some other backup strategy, e.g., response cost, privilege removal, grounding, time-out in another place. Backup contingencies are used only for getting off the chair and not for the original non-compliance; in this way, the chair becomes a highly effective punishment.

Leaving the chair is generally defined as when the child lifts his or her bottom off the chair, rocks the chair so that it moves around the floor, or tips the chair over. It’s OK for your child to swivel in the chair, turn about, look around, fidget, etc.

STEP 8**Managing your child's behaviour in public places**

- * Identify problem areas outside the home (e.g., visiting the supermarket) and previously employed strategies.



- * Anticipate such problems in public and establish a clear plan for dealing with them prior to going there:



review with your child your expectations for behaviour in this setting

establish some incentive for compliance with these rules



specify what types of outcomes/consequences will be applied should non-compliance occur

These might include: a) modified versions of strategies used successfully at home such as dispensing tokens for ongoing parental requests (e.g., "Stay close", "Don't touch") or removal of tokens for non-compliance; and, b) modified versions of time-out such as using quiet, out of the way public areas.

- * What will others think of you and your child in these situations?

What to do in the supermarket/shops to help children behave...(Without smacking, hitting or yelling.)

1. Give the child a responsibility, e.g., help select the hardest apple, find the longest green beans, match the coupons with the labels, etc.
2. Ignore inappropriate behaviour unless it is dangerous, destructive or embarrassing to you or a bother to others.
3. If a child gets out of control or embarrasses you, stop, pick him/her up and take him/her out of the shop or to the toilet or to a private place, talk to him or her quietly and tell him/her that this behaviour is inappropriate. If necessary, put him/her in the back seat of the car while you stay beside it or get in the front seat (saying nothing else). Wait for him/her to calm down. If this doesn't happen, you will have to go home. Get a sitter, return to the shops.
4. Praise appropriate behaviour/praise another child's appropriate behaviour.
5. Play a game, e.g., let's spot all the tennis shoes we can see on people's feet.
6. Let's guess how much something is going to cost (if child has some numerical skills).
7. Discuss rules before entering the shop. Let the child know, no "junk" foods. When we leave the child can select some type of treat if he/she has remembered and carried out the rules.
8. Bring a nutritious snack for the child to eat during the shopping trip.
9. Bring a book for the child to look at or a favourite toy.
10. Develop some sign language at home with the child, signals that mean "Stop", "Come here", "Be careful". Use them in public.
11. Don't let the child out of your sight. Hold hands, let him/her hold onto or help steer the trolley.
12. Reward appropriate behaviour. Talk to your child, play with him or her, engage in decision-making process.
13. Don't bring children who are tired or hungry to the shops. Arrange for a baby-sitter if possible.
14. Role play at home how to act in the store. Go when you are rested, as well as when the child is rested. Don't wait until the end of a tiring day.
15. Sing songs with him/her. Make up a "shopping" song.
16. Give the child something of yours to play with, e.g., keys, wallet, bag, etc.
17. Stop unacceptable behaviour as soon as it occurs. Don't ignore behaviour that is dangerous, destructive or embarrassing. Don't let the child think that you will allow such behaviour to occur in public.
18. Tell the child you will have to leave him/her at home next time -then do it.
19. Make a game out of shopping. Who can see the potatoes first? Do you remember what animal bacon comes from?
20. Talk about the pictures on the packages.
21. Let the child know ahead of time that you will stop by the park on the way home or play a game when you get home if he/she behaves well at the shops.

- Intersperse the shopping with fun activities where you sit and have a talk, play a game, etc.
22. Don't ever buy the child a treat from the shop where he/she threw a fit.
 23. Keep a supply of little action figures or small manipulative toys handy.
 24. Tie a favourite soft toy to the handle of the shopping cart.
 25. Let the child see how many things one can do with a certain item, e.g., what can you make out of tomato paste, etc.

 26. Find 5 items on each aisle that start with a certain letter (e.g., the first letter of your child's name), are red, are in cans, are for eating, are for not eating, etc.
 27. While standing in line, retell your child's favourite story or sing songs.
 28. Play "I see something" in the checkout lane and have your child guess what you see.
 29. Describe a food in the shopping cart and have your child guess what it is.
 30. Wear comfortable shoes and clothes, stay warm/cool.

 31. PRAISE, PRAISE, PRAISE! Whenever your child is doing something right.
 32. Take an older child with you who might like the diversion and be able to distract or entertain the younger child.
 33. Go shopping with a friend.

Taken from: Kersey, K.C. (1990). *Don't take it out on you kids! A parent's and teacher's guide to positive discipline*. Washington: Acropolis Books.

APPENDIX K
Correlation matrix for all dependent variables.

Table K1
Correlation matrix.

	Variables									
	1	2	3	4	5	6	7	8	9	10
1 ADHD par.total	1.00	.92*	.89*	.88*	.72*	.61*	-.03	.04	.04	.03
2 problems	.92*	1.00	.76*	.84*	.73*	.73*	.09	.15	.08	.06
3 inattention score	.89*	.76*	1.00	.96*	.31	.23	-.11	-.04	.16	.16
4 inattention symp.	.88*	.84*	.96*	1.00	.36	.26	.02	.07	.22	.21
5 hyp-imp score	.72*	.73*	.31	.36	1.00	.90*	.11	.14	-.16	-.17
6 hyp-imp symp.	.61*	.73*	.23	.26	.90*	1.00	-.02	.05	-.28	-.28
7 teacher total	-.03	.09	-.11	.02	.11	-.02	1.00	.93*	.70*	.71*
8 problems	.04	.15	-.04	.07	.14	.05	.93*	1.00	.58*	.68*
9 inattention score	.04	.08	.16	.22	-.16	-.28	.70*	.58*	1.00	.94*
10 inattention symp.	.03	.06	.16	.21	-.17	-.28	.71*	.68*	.94*	1.00
11 hyp-imp score	-.08	.05	-.31	-.19	.31	.25	.71*	.74*	.00	.06
12 hyp-imp symp	.02	.14	-.21	-.11	.37	.36	.56*	.68*	-.15	-.07
13 ODD par.total	.59*	.56*	.52*	.58*	.42	.27	-.06	-.14	.26	.21
14 problems	.68*	.66*	.62*	.69*	.46	.32	-.07	-.13	.23	.17
15 teacher total	-.07	.15	-.36	-.27	.40	.50*	.45	.49	.11	.15
16 problems	-.04	.17	-.31	-.23	.39	.52*	.39	.47	.06	.11
17 CPT omissions	-.30	-.24	-.28	-.22	-.19	-.21	.03	.15	-.25	-.14
18 CPT commissions	-.02	-.10	-.07	-.13	.06	-.01	.30	.09	.38	.27
19 GPRS-Oppos.	.72*	.72*	.56*	.56*	.63*	.62*	-.11	-.02	.08	.11
20 global index	.75*	.75*	.58*	.62*	.66*	.61*	-.11	-.05	-.10	-.08
21 CTRS-Oppos.	-.12	.06	-.38	-.31	.33	.44	.23	.27	-.01	.05
22 global index	-.18	-.08	-.49	-.43	.37	.39	.17	.27	-.20	-.09
23 PARQ-total	-.03	-.03	.02	.10	-.08	-.26	.39	.29	.59*	.59*
24 FES-Relationship	.28	.24	.14	.08	.35	.45	-.32	-.15	-.67*	-.64*
25 repeat commands	-.41	-.39	-.32	-.37	-.37	-.21	.06	.18	-.23	-.10
26 compliance	.22	.07	.13	.05	.26	.16	-.33	-.38	.00	-.03
27 child negative	-.57*	-.58*	-.56*	-.66*	-.34	-.16	-.18	-.11	-.37	-.24
28 parent approval	.22	.37	-.08	-.02	.57*	.68*	-.20	-.11	-.42	-.36
29 parent negative	--	--	--	--	--	--	--	--	--	--
30 off task	-.14	-.05	-.28	-.22	.13	.20	.07	.15	-.19	-.15
31 fidgeting	-.36	-.38	-.41	-.39	-.12	-.22	-.05	.04	-.32	-.24
32 vocalising	-.01	-.03	-.25	-.25	.36	.32	.10	.11	-.03	-.05
33 play with object	-.04	.06	-.12	-.11	.09	.31	-.42	-.24	-.50	-.38
34 off seat	.12	.15	.06	.13	.15	.17	-.24	-.06	-.42	-.30
35 total inattention	-.14	-.07	-.23	-.17	.05	.13	-.17	-.01	-.41	-.30

Note. * indicates $p < .05$

Table K1 Cont.

	Variables									
	11	12	13	14	15	16	17	18	19	20
1 ADHD par.total	-.08	.02	.59*	.68*	-.07	-.04	-.30	-.02	.72*	.75*
2 problems	.05	.14	.56*	.66*	.15	.17	-.24	-.10	.72*	.75*
3 inattention score	-.31	-.21	.52*	.62*	-.36	-.31	-.28	-.07	.56*	.58*
4 inattention symp.	-.19	-.11	.58*	.69*	-.27	-.23	-.22	-.13	.56*	.62*
5 hyp-imp score	.31	.37	.42	.46	.40	.39	-.19	.06	.63*	.66*
6 hyp-imp symp.	.25	.36	.27	.32	.50*	.52*	-.21	-.01	.62*	.61*
7 teacher total	.71*	.56*	-.06	-.07	.45	.39	.03	.30	-.11	-.11
8 problems	.74*	.68*	-.14	-.13	.49	.47	.15	.09	-.02	-.05
9 inattention score	.00	-.15	.26	.23	.11	.06	-.25	.38	.08	-.10
10 inattention symp.	.06	-.07	.21	.17	.15	.11	-.14	.27	.11	-.08
11 hyp-imp score	1.00	.94*	-.34	-.33	.52*	.49	.30	.05	-.23	-.05
12 hyp-imp symp.	.94*	1.00	-.40	-.36	.52*	.53*	.34	-.16	-.13	.01
13 ODD par.total	-.34	-.40	1.00	.97	.08	.01	-.42	.11	.75*	.68*
14 problems	-.33	-.36	.97	1.00	-.02	-.04	-.40	.07	.72*	.73*
15 teacher total	.52*	.52*	.08	-.02	1.00	.96*	-.11	.08	.38	.17
16 problems	.49	.53*	.01	-.04	.96*	1.00	-.15	.04	.41	.23
17 CPT omissions	.30	.34	-.42	-.40	-.11	-.15	1.00	-.60*	-.42	-.30
18 CPTcommissions	.05	-.16	.11	.07	.08	.04	-.60*	1.00	-.10	-.15
19 CPRS-Oppos.	-.23	-.13	.75*	.72*	.38	.41	-.42	-.10	1.00	.83*
20 global index	-.05	.01	.68*	.73*	.17	.23	-.30	-.15	.83*	1.00
21 CTRS-Oppos.	.33	.31	.12	.03	.82*	.81*	.04	.01	.33	.14
22 global index	.44	.45	-.16	-.20	.60*	.61*	.21	-.22	.11	.04
23 PARQ-total	-.03	-.20	.59*	.52*	.18	.10	-.08	.32	.17	.06
24 FES-relationship	.22	.44	-.36	-.26	-.16	-.11	.38	-.43	-.08	.07
25 repeat commands	.30	.34	-.39	-.46	.35	.39	.08	-.04	-.14	-.13
26 compliance	-.47	-.49	.37	.26	-.17	-.26	-.20	.10	.25	-.02
27 child negative	.10	.10	-.44*	-.59	.34	.33	.10	-.01	-.17	-.30
28 parent approval	.13	.20	.16	.12	.40	.31	.10	-.31	.40	.36
29 parent negative	--	--	--	--	--	--	--	--	--	--
30 off task	.28	.35	-.18	-.14	.22	.25	.24	-.08	-.22	-.33
31 fidgeting	.25	.30	-.43	-.44	-.03	-.07	.83*	-.34	-.43	-.41
32 vocalising	.16	.20	.03	.04	.33	.33	-.07	.27	-.00	-.20
33 play with object	-.10	.05	-.26	-.18	-.07	-.05	.41	-.44	-.11	-.15
34 off seat	.09	.21	-.03	.05	-.10	-.11	.51*	-.41	-.10	-.11
35 total inattention	.17	.29	-.28	-.22	.01	.00	.60*	-.40	-.29	-.35

Note. * indicates $p < .05$

Table K1 Cont.

	Variables									
	21	22	23	24	25	26	27	28	29	30
1 ADHD par.total	-.12	-.18	-.03	.28	-.41	.22	-.57*	.22	--	-.14
2 problems	.06	-.08	-.03	.24	-.39	.07	-.58*	.37	--	-.05
3 inattention score	-.38	-.49	.02	.14	-.32	.13	-.56*	-.08	--	-.28
4 inattention symp.	-.31	-.43	.10	.08	-.37	.05	-.66*	-.02	--	-.22
5 hyp-imp score	.33	.37	-.08	.35	-.37	.26	-.34	.57*	--	.13
6 hyp-imp problems	.44	.39	-.26	.45	-.21	.16	-.16	.68*	--	.20
7 teacher total	.23	.17	.39	-.32	.06	-.33	-.18	-.20	--	.07
8 problems	.27	.27	.29	-.15	.18	-.38	-.11	-.11	--	.15
9 inattention score	-.01	-.20	.59*	-.67*	-.23	.00	-.37	-.42	--	-.19
10 inattention symp.	.05	-.09	.59*	-.64*	-.10	-.03	-.24	-.36	--	-.15
11 hyp-imp score	.33	.44	-.03	.22	.30	-.47	.10	.13	--	.28
12 hyp-imp symp.	.31	.45	-.20	.44	.34	-.49	.10	.20	--	.35
13 ODD par.total	.12	-.16	.59*	-.36	-.39	.37	-.44	.16	--	-.18
14 problems	.03	-.20	.52*	-.26	-.46	.26	-.59*	.12	--	-.14
15 teacher total	.82*	.60*	.18	-.16	.35	-.17	.34	.40	--	.22
16 problems	.81*	.61*	.10	-.11	.39	-.26	.33	.31	--	.25
17 CPT omissions	.04	.21	-.08	.38	.08	-.20	.10	.10	--	.24
18 CPT commissions	.01	-.22	.32	-.43	-.04	.10	-.01	-.31	--	-.08
19 CPRS-oppos.	.33	.11	.17	-.08	-.14	.25	-.17	.40	--	-.22
20 global index	.14	.04	.06	.07	-.13	-.02	-.30	.36	--	-.33
21 CTRS-oppos.	1.00	.80*	.24	-.16	.17	.06	.37	.23	--	.43
22 global index	.80*	1.00	-.09	.09	.04	.12	.34	.29	--	.47
23 PARQ-total	.24	-.09	1.00	-.65*	-.07	.01	-.23	-.34	--	.11
24 FES-relationship	-.16	.09	-.65*	1.00	-.05	.00	-.07	.38	--	.32
25 repeat commands	.17	.04	-.07	-.05	1.00	-.65*	.78*	-.09	--	-.16
26 compliance	.06	.12	.01	.00	-.65*	1.00	-.15	.21	--	.10
27 child negative	.37	.34	-.23	-.07	.78*	-.15	1.00	.07	--	-.10
28 parent approval	.23	.29	-.34	.38	-.09	.21	.07	1.00	--	-.01
29 parent negative	--	--	--	--	--	--	--	--	1.00	--
30 off task	.43	.47	.11	.32	-.16	.10	-.10	-.01	--	1.00
31 fidgeting	-.01	.14	-.04	.31	.15	-.15	.19	.12	--	.22
32 vocalising	.46	.45	.26	.16	-.24	.29	-.11	-.01	--	.80*
33 play with object	.13	.30	-.35	.55	-.15	.09	.01	.42	--	.57*
34 off seat	.09	.18	.01	.49	-.16	.05	-.18	.21	--	.71*
35 total inattention	.21	.36	-.08	.51	-.12	.05	-.04	.19	--	.83*

Note. * indicates $p < .05$

Table K1 Cont.

	Variables				
	31	32	33	34	35
1 ADHD par.total	-.36	-.01	-.04	.12	-.14
2 problems	-.38	-.03	.06	.15	-.07
3 inattention score	-.41	-.25	-.12	.06	-.23
4 inattention symp.	-.39	-.25	-.11	.13	-.17
5 hyp-imp score	-.12	.36	.09	.15	.05
6 hyp-imp symp.	-.22	.32	.31	.17	.13
7 teacher total	-.05	.10	-.42	-.24	-.17
8 problems	.04	.11	-.24	-.06	-.01
9 inattention score	-.32	-.03	-.50	-.42	-.41
10 inattention symp	-.24	-.05	-.38	-.30	-.30
11 hyp-imp score	.25	.16	-.10	.09	.17
12 hyp-imp symp.	.30	.20	.05	.21	.29
13 ODD parent total	-.43	.03	-.26	-.03	-.28
14 problems	-.44	.04	-.18	.05	-.22
15 teacher total	-.03	.33	-.07	-.10	.01
16 problems	-.07	.33	-.05	-.11	.00
17 CPT omissions	.83*	-.07	.41	.51*	.60*
18 CPTcommissions	-.34	.27	-.44	-.41	-.40
19 CPRS-oppos.	-.43	-.00	-.11	-.10	-.29
20 global index	-.41	-.20	-.15	-.11	-.35
21 CTRS-oppos.	-.01	.46	.13	.09	.21
22 global index	.14	.45	.30	.18	.36
23 PARQ-total	-.04	.26	-.35	.01	-.08
24 FES-relationship	.31	.16	.55*	.49	.51*
25 repeat commands	.15	-.24	-.15	-.16	-.12
26 compliance	-.15	.29	.09	.05	.05
27 child negative	.19	-.11	.01	-.18	-.04
28 parent approval	.12	-.01	.42	.21	.19
29 parent negative	--	--	--	--	--
30 off task	.22	.80*	.57*	.71*	.83*
31 fidgeting	1.00	.15	.31	.47	.58*
32 vocalising	.15	1.00	.35	.45	.56*
33 play with object	.31	.35	1.00	.77*	.82*
34 off seat	.47	.45	.77*	1.00	.93*
35 total inattention	.58*	.56*	.82*	.93*	1.00

Note. * indicates correlations significant at $p < .05$

APPENDIX L

ANCOVA results for intervention groups x dependent variables

1. ADHD Rating Scale – Parent version

Table L1
ANCOVA Results for Total Score

Factor	df	F	p
group (1)	3	0.50	.69
intervention phase (2)	2	2.63	.09
1 x 2	6	2.07	.09

Table L2
Levene's Test for Total Score

Intervention Phase	df	F	p
pre	3	8.49	.00*
during	3	1.63	.24
post	3	2.11	.15

Note. * indicates $p=.003$

Table L3
Means for Group x Intervention Phase for Total Score

Group	Intervention Phase	M
1	pre	39.00
	during	27.88
	post	26.38
2	pre	35.00
	during	23.38
	post	28.25
3	pre	38.75
	during	43.75
	post	38.50
4	pre	34.45
	during	34.67
	post	35.63

Table L4
ANCOVA Results for Total Number of Problems

Factor	df	<i>F</i>	<i>p</i>
group (1)	3	0.76	.54
intervention phase (2)	2	2.56	.10
1 x 2	6	1.83	.13

Table L5
Levene's Test for Total Number of Symptoms

Intervention Phase	df	<i>F</i>	<i>p</i>
pre	3	4.15	.03
during	3	2.13	.15
post	3	2.93	.08

Table L6
Means for Group x Intervention Phase for Total Number of Problems

Group	Intervention Phase	<i>M</i>
1	pre	15.25
	during	10.25
	post	7.75
2	pre	12.50
	during	7.75
	post	8.75
3	pre	14.00
	during	16.50
	post	14.50
4	pre	12.12
	during	12.67
	post	12.25

Table L7
ANCOVA Results for Inattention Score

Factor	df	<i>F</i>	<i>p</i>
group (1)	3	0.41	.75
intervention phase (2)	2	0.90	.42
1 x 2	6	1.28	.30

Table L8
Levene's Test for Inattention Score

Intervention Phase	df	F	p
pre	3	5.78	.01
during	3	0.91	.46
post	3	1.08	.40

Table L9
Means for Group x Intervention Phase for Inattention Score

Group	Intervention Phase	M
1	pre	17.75
	during	13.50
	post	12.00
2	pre	14.50
	during	10.38
	post	12.38
3	pre	15.50
	during	18.25
	post	15.75
4	pre	15.98
	during	15.67
	post	17.38

Table L10
ANCOVA Results for Number of Inattention Problems

Factor	df	F	p
group (1)	3	0.73	.55
intervention phase (2)	2	1.80	.19
1 x 2	6	1.69	.17

Table L11
Levene's Test for Number of Inattention Problems

Intervention Phase	df	F	p
pre	3	13.22	.00*
during	3	1.40	.29
post	3	0.93	.46

Note. * indicates $p=.0004$

Table L12
*Means for Group x Intervention Phase
 for Number of Inattention Problems*

Group	Intervention Phase	<i>M</i>
1	pre	7.00
	during	5.50
	post	3.25
2	pre	5.00
	during	3.25
	post	3.25
3	pre	5.75
	during	7.50
	post	6.25
4	pre	5.45
	during	5.33
	post	5.75

Table L13
ANCOVA Results for Hyperactivity-Impulsivity Score

Factor	df	<i>F</i>	<i>p</i>
group (1)	3	1.24	.34
intervention phase (2)	2	3.90	.03
1 x 2	6	2.26	.07

Table L14
*Levene's Test for Hyperactivity-Impulsivity
 Score*

Intervention Phase	df	<i>F</i>	<i>p</i>
pre	3	0.12	.95
during	3	1.98	.17
post	3	4.38	.03

Table L15
*Means for Intervention Phase for
 Hyperactivity-Impulsivity Score*

Intervention Phase	<i>M</i>
pre	20.87
during	17.97
post	17.81

Table L16
*Means for Group x Intervention Phase
 For Hyperactivity-Impulsivity Score*

Group	Intervention Phase	<i>M</i>
1	pre	21.25
	during	14.38
	post	14.37
2	pre	20.50
	during	13.00
	post	15.87
3	pre	23.25
	during	25.50
	post	22.75
4	pre	18.47
	during	19.00
	post	18.25

Table L17
*Post hoc Comparisons for Group x Intervention
 Phase for Hyperactivity-Impulsivity Score*

	pre <i>p</i>	during <i>p</i>	post <i>p</i>
pre	-	.03	.05
during	.03	-	.90
post	.05	.90	-

Table L18
ANCOVA Results for Number of Hyperactivity-Impulsivity Problems

Factor	df	<i>F</i>	<i>p</i>
group (1)	3	0.70	.57
intervention phase (2)	2	2.48	.11
1 x 2	6	1.53	.21

Table L19
Levene's Test for Number of Hyperactivity-Impulsivity Problems

Intervention Phase	df	<i>F</i>	<i>p</i>
pre	3	0.70	.57
during	3	3.30	.06
post	3	11.22	.00*

Note. * indicates $p = .0008$

Table L20
Means for Group x Intervention Phase For Number of Hyperactivity-Impulsivity Problems

Group	Intervention Phase	<i>M</i>
1	pre	7.75
	during	4.75
	post	4.50
2	pre	7.50
	during	4.50
	post	5.50
3	pre	8.25
	during	9.00
	post	8.25
4	pre	6.63
	during	7.33
	post	6.50

2. ADHD Rating Scale – Teacher version

Table L21

ANCOVA Results for Total Score

Factor	df	<i>F</i>	<i>p</i>
group (1)	3	0.52	.68
intervention phase (2)	1	21.68	.00*
1 x 2	3	6.76	.00**

Note. * indicates $p=.0006$; ** indicates $p=.006$

Table L22

Levene's Test for Total Score

Intervention Phase	df	<i>F</i>	<i>p</i>
pre	3	.41	.75
post	3	1.11	.38

Table L23

*Means for Intervention Phase
For Total Score*

Intervention Phase	<i>M</i>
pre	34.66
post	23.53

Table L24

*Means for Group x Intervention
Phase for Total Score*

Group	Intervention Phase	<i>M</i>
1	pre	40.75
	post	11.00
2	pre	32.00
	post	27.63
3	pre	34.75
	post	29.25
4	pre	31.13
	post	26.25

Table L25
Post hoc Comparisons for Group x Intervention Phase for Total Score

Group	Intervention Phase	Group 1		Group 2		Group 3		Group 4	
		pre	post	pre	post	pre	post	pre	post
1	pre	-	.00*	.20	.14	.23	.18	.24	.11
	post	.00*	-	.00**	.01	.00**	.01	.00**	.00**
2	pre	.20	.00**	-	.80	.58	.84	.86	.75
	post	.14	.01	.80	-	.59	.74	.75	.78
3	pre	.23	.00**	.58	.59	-	.67	.73	.51
	post	.18	.01	.84	.74	.67	-	.71	.81
4	pre	.24	.00**	.86	.75	.73	.70	-	.74
	post	.11	.00**	.75	.78	.51	.81	.74	-

Note. * indicates $p=.001$; ** indicates $p\leq.009$

Table L26
ANCOVA Results for Total Number of Problems

Factor	df	F	p
group (1)	3	0.76	.54
intervention phase (2)	1	16.23	.00*
1 x 2	3	4.51	.02

Note. * indicates $p=.002$

Table L27
Levene's Test for Total Number of Problems

Intervention Phase	df	F	p
pre	3	0.31	.82
post	3	1.58	.25

Table L28
Means for Intervention Phase for Total Number of Problems

Intervention Phase	M
pre	11.88
post	7.31

Table L29
Means for Group x Intervention Phase
For Total Number of Problems

Group	Intervention Phase	M
1	pre	13.75
	post	2.00
2	pre	12.00
	post	9.25
3	pre	11.75
	post	10.00
4	pre	10.00
	post	8.00

Table L30
Post hoc Comparisons for Group x Intervention Phase for Total Number of Problems

Group	Intervention Phase	Group 1		Group 2		Group 3		Group 4	
		Pre	post	pre	post	pre	post	pre	post
1	pre	-	.00*	.45	.40	.66	.50	.39	.23
	post	.00*	-	.01	.02	.01	.02	.03	.02
2	pre	.45	.01	-	.74	.91	.81	.66	.52
	post	.40	.02	.74	-	.69	.75	.94	.59
3	pre	.67	.01	.91	.69	-	.73	.45	.49
	post	.49	.02	.81	.75	.73	-	**	.67
4	pre	.39	.03	.66	.94	.45	**	-	.81
	post	.23	.02	.52	.59	.49	.66	.81	-

Note. * indicates $p=.004$; ** = 1.00

Table L31
ANCOVA Results for Inattention Score

Factor	df	F	p
group (1)	3	2.86	.09
intervention phase (2)	1	19.32	.00*
1 x 2	3	10.90	.00*

Note. * indicates $p=.0009$; ** indicates $p=.001$

Table L32
Levene's Test for Inattention Score

Intervention Phase	df	F	p
pre	3	0.27	.85
post	3	1.59	.24

Table L33
Means for Intervention Phase For Inattention Score

Intervention Phase	M
pre	15.97
post	11.13

Table L34
Means for Group x Intervention Phase for Inattention Score

Group	Intervention Phase	M
1	pre	18.38
	post	3.17
2	pre	12.25
	post	13.38
3	pre	14.25
	post	10.00
4	pre	19.00
	post	18.00

Table L35

Post hoc Comparisons for Group x Intervention Phase for Inattention Score

Group	Intervention Phase	Group 1		Group 2		Group 3		Group 4	
		Pre	post	pre	post	pre	post	pre	post
1	pre	-	.00*	.10	.16	.19	.02	.78	.87
	post	.00*	-	.00**	.00**	.00**	.00**	.00*	.00*
2	pre	.10	.00**	-	.62	.65	.33	.08	.09
	post	.16	.00**	.62	-	.70	.31	.14	.13
3	pre	.19	.00**	.65	.70	-	.27	.19	.11
	post	.02	.01	.33	.31	.27	-	.02	.02
4	pre	.78	.00*	.08	.14	.19	.02	-	.89
	post	.87	.00*	.09	.13	.11	.02	.89	-

Note. * indicates $p=.0004$; $p\leq .009$

Table L36

ANCOVA Results for Number of Inattention Problems

Factor	df	F	p
group (1)	3	1.91	.19
intervention phase (2)	1	11.21	.00*
1 x 2	3	4.64	.02

Note. * indicates $p=.006$

Table L37

Levene's Test for Number of Inattention Problems

Intervention Phase	df	F	p
pre	3	0.23	.87
post	3	3.32	.06

Table L38

Means for Intervention Phase for Number of Inattention Problems

Intervention Phase	M
pre	5.25
post	3.25

Table L39
*Means for Group x Intervention Phase
 for Number of Inattention Problems*

Group	Intervention Phase	M
1	pre	5.75
	post	0.00
2	pre	4.50
	post	4.50
3	pre	4.25
	post	2.75
4	pre	6.50
	post	5.75

Table L40
Post hoc comparisons for Group x Intervention Phase for Number of Inattention Problems

Group	Intervention Phase	Group 1		Group2		Group3		Group 4	
		pre	post	pre	post	pre	post	pre	post
1	pre	-	.00*	.56	.32	.61	.15	.81	**
	post	.00*	-	.01	.02	.01	.04	.00*	.00*
2	pre	.56	.01	-	1.00	.84	.34	.48	.73
	post	.32	.02	**	-	.98	.49	.38	.56
3	pre	.61	.01	.84	.98	-	.23	.46	.72
	post	.15	.04	.34	.49	.23	-	.09	.20
4	pre	.81	.00*	.48	.38	.46	.09	-	.54
	post	1.0	.00*	.73	.56	.72	.20	.54	-

Note. * indicates $p \leq .006$; **=1.00

Table L41
ANCOVA Results for Hyperactivity-Impulsivity Score

Factor	df	F	p
group (1)	3	1.99	.17
intervention phase (2)	1	15.15	.00*
1 x 2	3	3.19	.06

Note. * indicates $p = .002$

Table L42
Levene's Test for Hyperactivity-Impulsivity Score

Intervention Phase	df	F	p
pre	3	1.49	.27
post	3	0.39	.76

Table L43
Means for Group x Intervention Phase for Hyperactivity-Impulsivity Score

Group	Intervention Phase	M
1	pre	22.38
	post	7.83
2	pre	19.75
	post	14.25
3	pre	20.50
	post	19.25
4	pre	12.13
	post	8.25

Table L44
Means for Intervention Phase for Hyperactivity-Impulsivity Score

Intervention Phase	M
pre	18.69
post	12.40

Table L45
ANCOVA Results for Number of Hyperactivity-Impulsivity Problems

Factor	df	F	p
group (1)	3	2.85	.09
intervention phase (2)	1	15.71	.00*
1 x 2	3	3.77	.04

Note. * indicates $p = .002$

Table L46
Levene's Test for Number of Hyperactivity-Impulsivity Problems

Intervention Phase	df	F	p
pre	3	5.38	.01
post	3	0.61	.62

Table L47
Means for Intervention Phase for Number of Hyperactivity-Impulsivity Problems

Intervention Phase	M
pre	6.63
post	4.06

Table L48
Means for Group x Intervention Phase for Number of Hyperactivity-Impulsivity Problems

Group	Intervention Phase	M
1	pre	8.00
	post	2.00
2	pre	7.50
	post	4.75
3	pre	7.50
	post	7.25
4	pre	3.50
	post	2.25

Table L49

Post hoc Comparisons for Group x Intervention Phase for Number of Hyperactivity-Impulsivity Problems

Group	Intervention Phase	Group 1		Group 2		Group 3		Group 4	
		pre	post	pre	post	pre	post	pre	post
1	pre	-	.00*	.92	.15	.71	.94	.04	.01
	post	.00*	-	.01	.20	.01	.01	.50	.85
2	pre	.92	.01	-	.13	**	.85	.04	.01
	post	.15	.20	.13	-	.20	.08	.35	.17
3	pre	.71	.01	**	.20	-	.98	.06	.02
	post	.94	.01	.85	.08	.98	-	.03	.01
4	pre	.04	.50	.04	.35	.06	.03	-	.35
	post	.01	.85	.01	.17	.01	.01	.35	-

Note. * indicates $p=.009$; **= 1.00

3. Rating Scale IV (A) – Parent version

Table L50

ANCOVA Results for Total Score

Factor	df	F	p
group (1)	3	1.05	.41
intervention phase (2)	2	2.55	.10
1 x 2	6	3.18	.92

Table L51

Levene's Test for Total Score

Intervention Phase	df	F	p
pre	3	3.88	.04
during	3	0.31	.82
post	3	0.41	.75

Table L52
Means for Group x Intervention
Phase for Total Score

Group	Intervention Phase	<i>M</i>
1	pre	16.68
	during	11.88
	post	13.25
2	pre	11.88
	during	9.75
	post	9.38
3	pre	20.25
	during	18.00
	post	16.50
4	pre	17.92
	during	16.67
	post	17.63

Table L53
ANCOVA Results for Number of Problems

Factor	df	<i>F</i>	<i>p</i>
group (1)	3	0.86	.49
intervention phase (2)	2	1.98	.16
1 x 2	6	0.54	.77

Table L54
Levene's Test for Number of Problems

Intervention Phase	df	<i>F</i>	<i>p</i>
pre	3	4.89	.02
during	3	0.44	.73
post	3	0.38	.77

Table L55
*Means for Group x Intervention
 Phase for Number of Problems*

Group	Intervention Phase	<i>M</i>
1	pre	5.82
	during	3.50
	post	3.25
2	pre	4.00
	during	3.00
	post	2.75
3	pre	7.50
	during	6.50
	post	6.00
4	pre	5.95
	during	6.00
	post	6.50

4. Rating Scale IV (A) – Teacher version

Table L56
ANCOVA Results for Total Score

Factor	df	<i>F</i>	<i>p</i>
group (1)	3	1.45	.28
intervention phase (2)	1	6.54	.03
1 x 2	3	1.94	.18

Table L57
Levene's Test for Total Score

Intervention Phase	df	<i>F</i>	<i>p</i>
pre	3	0.65	.60
post	3	2.15	.15

Table L58
*Means for Intervention Phase for
 Total Score*

Intervention Phase	<i>M</i>
pre	11.38
post	6.94

Table L59
ANCOVA Results for Number of Problems

Factor	df	<i>F</i>	<i>p</i>
group (1)	3	1.13	.38
intervention phase (2)	1	7.08	.02
1 x 2	3	1.05	.41

Table L60
Levene's Test for Number of Problems

Intervention Phase	df	<i>F</i>	<i>p</i>
pre	3	0.91	.47
post	3	2.51	.11

Table L61
Means for Intervention Phase for Number of Problems

Intervention Phase	<i>M</i>
pre	3.50
post	1.81

5. Connors' Rating Scale – Parent version

Table L62
ANCOVA Results for Global Index

Factor	df	<i>F</i>	<i>p</i>
group (1)	3	1.13	.38
intervention phase (2)	1	0.02	.89
1 x 2	3	1.20	.35

Table L63
Levene's Test for Global Index

Intervention	df	F	p
pre	3	4.06	.03
post	3	1.37	.30

Table L64
Means for Group x Intervention Phase for Global Index

Group	Intervention Phase	M
1	pre	72.50
	post	69.75
2	pre	70.25
	post	63.00
3	pre	83.00
	post	83.00
4	pre	68.25
	post	76.50

Table L65
ANCOVA Results for Oppositional Subscale

Factor	df	F	p
group (1)	3	0.55	.66
intervention phase (2)	1	1.76	.21
1 x 2	3	0.74	.55

Table L66
Levene's Test for Oppositional Subscale

Intervention Phase	df	F	p
pre	3	0.86	.49
post	3	0.32	.81

Table L67
Means for Group x Intervention
Phase for Oppositional Subscale

Group	Intervention Phase	<i>M</i>
1	pre	73.75
	post	67.00
2	pre	69.25
	post	59.00
3	pre	81.75
	post	80.75
4	pre	76.50
	post	78.00

6. Conners' Rating Scale – Teacher version

Table L68
ANCOVA Results for Global Index.

Factor	df	<i>F</i>	<i>p</i>
group (1)	3	2.28	.14
intervention phase (2)	1	18.78	.00*
1 x 2	3	1.89	.19

Note. * indicates $p < .001$

Table L69
Levene's Test for Global Index.

Intervention Phase	df	<i>F</i>	<i>p</i>
pre	3	.20	.90
post	3	.34	.80

Table L70
Means for Intervention Phase for
Global Index.

Intervention Phase	<i>M</i>
pre	75.94
post	65.46

Table L71
ANCOVA Results for Oppositional Subscale.

Factor	df	F	p
group (1)	3	1.67	.23
intervention phase (2)	1	3.18	.10
1 x 2	3	0.86	.49

Table L72
Levene's Test for Oppositional Subscale.

Intervention Phase	df	F	p
pre	3	0.52	.67
post	3	1.77	.21

Table L73
Means for Group x Intervention Phase for Oppositional Subscale

Group	Intervention Phase	M
1	pre	64.50
	post	50.00
2	pre	68.25
	post	66.00
3	pre	77.75
	post	78.25
4	pre	75.00
	post	59.00

7. Conners' Kiddy-Continuous Performance Task

Table L74
ANCOVA Results for % Omissions

Factor	df	F	p
group (1)	3	4.54	.03
intervention phase (2)	1	1.19	.30
1 x 2	3	2.36	.12

Table L75
Levene's Test for % Omissions

Intervention phase	df	<i>F</i>	<i>p</i>
pre	3	3.52	.05
post	3	5.18	.02

Table L76
Means for Group x Intervention Phase for % Omissions

Group	Intervention Phase	<i>M</i>
1	pre	33.75
	post	5.50
2	pre	61.75
	post	52.75
3	pre	24.00
	post	28.75
4	pre	20.25
	post	29.00

Table L77
Means for Group for % Omissions

Group	<i>M</i>
1	18.30
2	55.88
3	27.98
4	25.71

Table L78
ANCOVA Results for % Commissions

Factor	df	<i>F</i>	<i>p</i>
group (1)	3	0.15	.93
intervention phase (2)	1	2.72	.13
1 x 2	3	1.29	.32

Table L79
Levene's Test for % Commissions

Intervention Phase	df	F	p
pre	3	1.77	.21
post	3	0.49	.70

Table L80
Means for Group x Intervention Phase for % Commissions

Group	Intervention Phase	M
1	pre	49.00
	post	22.00
2	pre	30.50
	post	36.50
3	pre	46.50
	post	42.50
4	pre	59.00
	post	42.00

8. Parent Acceptance Rejection Questionnaire (PARQ) – Total

Table L81
ANCOVA Results for PARQ-Total

Factor	df	F	p
group (1)	3	0.41	.75
intervention phase (2)	1	1.38	.26
1 x 2	3	2.94	.08

Table L82
Levene's Test for PARQ-Total

Intervention Phase	df	F	p
pre	3	1.36	.30
post	3	1.37	.30

Table L83
*Means for Group x Intervention
 Phase for PARQ-Total*

Group	Intervention Phase	<i>M</i>
1	pre	100.50
	post	81.50
2	pre	90.00
	post	94.75
3	pre	113.25
	post	115.25
4	pre	110.12
	post	107.83

8. Family Environment Scale (FES) – Relationship Index

Table L84
ANCOVA Results for FES-Relationship Index

Factor	df	<i>F</i>	<i>p</i>
group (1)	3	3.11	.07
intervention phase (2)	1	6.27	.03
1 x 2	3	0.56	.65

Table L85
Levene's Test for FES-Relationship Index

Intervention Phase	df	<i>F</i>	<i>p</i>
pre	3	0.69	.58
post	3	2.83	.08

Table L86
*Means for Intervention Phase for
 FES-Relationship Index*

Intervention Phase	<i>M</i>
pre	16.07
post	18.05

9. Behaviour observation of parent/child interaction – Compliance task

Table L87
ANCOVA Results for Number of Repeat Commands

Factor	df	F	p
group (1)	3	0.78	.53
intervention phase (2)	1	7.94	.02
1 x 2	3	0.88	.48

Table L88
Levene's Test for Number of Repeat Commands

Intervention Phase	df	F	p
pre	3	5.30	.02
post	3	0.97	.44

Table L89
Means for Intervention Phase for Number of Repeat Commands

Intervention Phase	M
pre	.61
post	.29

Table L90
Means for Group x Intervention Phase For Number of Repeat Commands

Group	Intervention Phase	M
1	pre	.54
	post	.35
2	pre	.61
	post	.52
3	pre	.69
	pre	.19
4	pre	.61
	post	.11

Table L91
ANCOVA Results for % Child Compliance

Factor	df	F	p
group(1)	3	1.05	.41
intervention phase (2)	1	6.14	.03
1 x 2	3	0.23	.88

Table L92
Levene's Test for % Child Compliance

Intervention Phase	df	F	p
pre	3	4.65	.02
post	3	3.18	.06

Table L93
Means for Intervention Phase for % Child Compliance

Intervention Phase	M
pre	60.25
post	77.40

Table L94
Means for Group x Intervention Phase for % Child Compliance

Group	Intervention Phase	M
1	pre	51.08
	post	71.86
2	pre	52.45
	post	65.61
3	pre	63.48
	post	87.88
4	pre	74.00
	post	84.25

Table L95
ANCOVA Results for % Child Negative

Factor	df	F	p
group (1)	3	1.69	.23
intervention phase (2)	1	0.19	.67
1 x 2	3	0.43	.74

Table L96
Levene's Test for % Child Negative

Intervention Phase	df	F	p
pre	3	4.76	.02
post	3	11.18	.00*

Note. * indicates $p=.0009$

Table L97
Means for Group x Intervention Phase
for % Child Negative

Group	Intervention Phase	M
1	pre	0.00
	post	4.55
2	pre	13.07
	post	16.43
3	pre	8.80
	post	0.00
4	pre	20.00
	post	11.00

Table L98
ANCOVA Results for Number of Parental Approval

Factor	df	F	p
group (1)	3	0.59	.64
intervention phase (2)	1	1.52	.24
1 x 2	3	0.38	.77

Table L99
Levene's Test for Number of Parent Approval

Intervention Phase	df	F	p
pre	3	0.88	.48
post	3	0.96	.44

Table L100
Means for Group x Intervention Phase for Number of Parent Approval

Group	Intervention Phase	M
1	pre	.15
	post	.10
2	pre	.15
	post	.10
3	pre	.13
	post	.15
4	pre	.08
	post	.03

10. Behaviour observations of parent/child interactions – attention

Table L101
ANCOVA Results for % Off-task

Factor	df	F	p
group (1)	3	0.21	.89
intervention phase (2)	1	1.10	.31
1 x 2	3	0.60	.63

Table L102
Levene's Test for % Off-task

Intervention Phase	df	F	p
pre	3	0.53	.67
post	3	7.32	.00*

Note. * indicates $p=.005$

Table L103
*Means for Group x Intervention
 Phase for % Off-task*

Group	Intervention Phase	<i>M</i>
1	pre	12.50
	post	2.50
2	pre	20.83
	post	2.50
3	pre	16.26
	post	0.75
4	pre	10.50
	post	20.08

Table L104
ANCOVA Results for % Fidgeting

Factor	df	<i>F</i>	<i>p</i>
group (1)	3	0.99	.43
intervention phase (2)	1	4.59	.05
1 x 2	3	2.50	.11

Table L105
Levene's Test for % Fidgeting

Intervention Phase	df	<i>F</i>	<i>p</i>
pre	3	1.66	.23
post	3	4.13	.03

Table L106
*Means for Group x Intervention
 Phase for % Fidgeting*

Group	Intervention Phase	<i>M</i>
1	pre	13.25
	post	10.83
2	pre	32.50
	post	4.08
3	pre	10.91
	post	1.25
4	pre	7.08
	post	10.25

Table L107
*Means for Intervention Phase
 for % Fidgeting*

Intervention Phase	<i>M</i>
pre	15.93
post	6.60

Table L108
ANCOVA Results for % Vocalising

Factor	df	<i>F</i>	<i>p</i>
group (1)	3	0.13	.94
intervention phase (2)	1	2.61	.13
1 x 2	3	0.77	.53

Table L109
Levene's Test for % Vocalising

Intervention Phase	df	<i>F</i>	<i>p</i>
pre	3	3.37	.05
post	3	9.00	.00*

Note. * indicates $p=.002$

Table L110
ANCOVA Results for % Playing with Object

Factor	df	<i>F</i>	<i>p</i>
group (1)	3	2.49	.12
intervention phase (2)	1	0.07	.80
1 x 2	3	0.08	.97

Table L111
Levene's Test for % Playing With Object

Intervention Phase	df	<i>F</i>	<i>p</i>
pre	3	24.24	.00*
post	3	6.28	.00**

Note. * indicates $p=.00002$; ** indicates $p=.008$

Table L112
ANCOVA Results for % Out of Seat

Factor	df	F	p
group (1)	3	1.33	.31
intervention phase (2)	1	0.43	.52
1 x 2	3	0.52	.68

Table L113
Levene's Test for % Out of Seat

Intervention Phase	df	F	p
pre	3	2.29	.13
post	3	6.41	.00*

Note. * indicates $p=.008$

Table L114
Means for Group x Intervention Phase for % Out of Seat

Group	Intervention Phase	M
1	pre	11.67
	post	0.00
2	pre	30.09
	post	14.25
3	pre	12.02
	post	0.00
4	pre	8.25
	post	22.50

Table L115
ANCOVA Results for Total Inattention for All Categories

Factor	df	F	p
group (1)	3	1.24	.34
intervention phase (2)	1	1.18	.30
1 x 2	3	0.84	.50

Table L116
Levene's Test for Total Inattention for All Categories

Intervention Phase	df	F	p
pre	3	0.73	.55
post	3	4.83	.02

Table L117
*Means for Group x Intervention Phase
 For Total Inattention for All Categories*

Group	Intervention Phase	<i>M</i>
1	pre	7.58
	post	2.92
2	pre	20.08
	post	7.26
3	pre	7.21
	post	0.43
4	pre	6.75
	post	12.58

11. Programme Evaluation

General evaluation

ANCOVA results: $F(3,11) = .38, p = .77$

Like parent programme

ANCOVA results: $F(3,11) = .99, p = .43$

Like medication

ANCOVA results: $F(3,11) = 1.86, p = .20$

Like sessions

ANCOVA results: $F(3,11) = 1.88, p = .19$

Table L118

*Means x Group for General Evaluation, % Like Parent Programme,
 % Like Medication and % Like Session*

	general evaluation	parent programme	medication	sessions
Group	<i>M</i>	<i>M</i>	<i>M</i>	<i>M</i>
1	68.73	70.88	74.59	78.21
2	74.04	81.62	81.83	63.75
3	64.64	71.70	57.20	87.06
4	66.75	61.97	61.80	86.59

Attendance

ANCOVA results: $F(3,11) = 1.14, p = .38$

Table L119

Means x Group for Attendance

Group	<i>M</i>
1	78.60
2	63.64
3	100.00
4	72.43

APPENDIX M
MANCOVA results for treatment components x dependent variables

1. ADHD Rating Scale – Parent version

Table M1

MANCOVA Results for Total Score and Total Number of Problems

Factor	<i>F</i>	df 1	df 2	<i>p</i>
pharmacotherapy (1)	1.38	2	10	.30
behavioural intervention (2)	2.26	2	10	.15
intervention phase (3)	2.43	2	9	.12
1 x 2	0.05	2	10	.95
1 x 3	2.79	4	9	.09
2 x 3	0.50	4	9	.74
1 x 2 x 3	0.87	4	9	.52

Table M2

MANCOVA Results for Inattention Score and Number of Inattention Problems

Factor	<i>F</i>	df 1	df 2	<i>p</i>
pharmacotherapy (1)	1.39	2	10	.29
behavioural intervention (2)	14.92	2	10	.00*
intervention phase (3)	4.73	4	9	.03
1 x 2	1.20	2	10	.34
1 x 3	4.40	4	9	.03
2 x 3	0.91	4	9	.50
1 x 2 x 3	0.87	4	9	.52

Note. * indicates $p=.001$

Table M3

Means for Behavioural Intervention for Inattention Score and Number of Problems

Factor	<i>M</i>
Support group	14.34
Parent training	15.50

Table M4
Means for Intervention Phase for Inattention Score and Number of Problems

Intervention phase	Total (M)	Problems (M)
pre	15.93	5.80
during	14.45	5.40
post	14.38	4.63

All post hoc comparisons are nonsignificant.

Table M5
Means for Pharmacotherapy x Intervention Phase Interaction for Inattention Score and Number of Problems

Group	Intervention Phase	Total (M)	Problems (M)
Active	pre	16.13	6.00
	during	11.94	4.38
	post	12.19	3.25
Placebo	pre	15.74	5.60
	during	16.96	6.42
	post	16.56	6.00

Table M6
Post hoc Comparisons for Pharmacotherapy x Intervention Phase Interaction for Number of Inattention Problems

		Active			Placebo		
	pre	during	post	pre	during	post	
	<i>p</i>	<i>p</i>	<i>p</i>	<i>p</i>	<i>p</i>	<i>p</i>	
Active	pre	-	.18	.02	.66	.89	*
	during	.18	-	.22	.18	.18	.29
	post	.02	.22	-	.04	.02	.04
Placebo	pre	.66	.18	.04	-	.80	.90
	during	.89	.18	.02	.80	-	.64
	post	*	.29	.04	.90	.64	-

*=1.00

All post hoc comparisons for total inattention score are nonsignificant.

Table M7
*MANCOVA Results for Hyperactivity-Impulsivity Score
 and Number of Problems*

Factor	<i>F</i>	df 1	df 2	<i>p</i>
pharmacotherapy (1)	0.20	2	10	.82
behavioural intervention (2)	1.46	2	10	.28
intervention phase (3)	2.83	4	9	.09
1 x 2	0.80	2	10	.48
1 x 3	4.75	4	9	.03
2 x 3	0.29	4	9	.88
1 x 2 x 3	0.20	4	9	.93

Table M8
*Means for Pharmacotherapy x Intervention Phase Interaction
 for Hyperactivity-Impulsivity Score and Number of Problems*

Group	Intervention Phase	Total (<i>M</i>)	Problems (<i>M</i>)
Active	pre	20.88	7.64
	during	13.69	4.63
	post	15.13	5.00
Placebo	pre	20.86	7.44
	during	22.25	8.17
	post	20.50	7.38

Table M9
*Post hoc Comparisons for Pharmacotherapy x Intervention Phase
 Interaction for Hyperactivity-Impulsivity Score*

	Active			Placebo		
	pre <i>p</i>	during <i>p</i>	post <i>p</i>	pre <i>p</i>	during <i>p</i>	post <i>p</i>
Active						
pre	-	.003	.01	.99	.44	.98
during	.003	-	.42	.002	.001	.002
post	.01	.42	-	.008	.004	.005
Placebo						
pre	.99	.002	.008	-	.71	.84
during	.44	.001	.004	.71	-	.75
post	.98	.002	.005	.84	.75	-

Table M10
*Post hoc Comparisons for Pharmacotherapy x Intervention Phase
 Interaction for Number of Hyperactivity-Impulsivity Problems*

	Active			Placebo		
	pre	during	post	pre	during	post
	<i>p</i>	<i>p</i>	<i>p</i>	<i>p</i>	<i>p</i>	<i>p</i>
Active						
pre	-	.03	.04	.84	.56	.96
during	.03	-	.69	.03	.009	.02
post	.04	.69	-	.04	.02	.02
Placebo						
pre	.84	.03	.04	-	.71	.94
during	.56	.009	.02	.71	-	.83
post	.96	.02	.02	.94	.83	-

2. ADHD Rating Scale – Teacher version

Table M11
MANCOVA Results for Total Score and Total Number of Problems

Factor	<i>F</i>	df 1	df 2	<i>p</i>
pharmacotherapy (1)	0.55	2	10	.59
behavioural intervention (2)	0.19	2	10	.83
intervention phase (3)	10.06	2	11	.00*
1 x 2	1.75	2	10	.22
1 x 3	2.86	2	11	.10
2 x 3	4.21	2	11	.04
1 x 2 x 3	3.35	2	11	.07

Note. * indicates $p = .003$

Table M12
*Means for Intervention Phase for Total Score
 and Total Number of Problems*

Intervention Phase	Total (<i>M</i>)	Problems (<i>M</i>)
pre	34.66	11.88
post	23.53	7.31

Table M13
Post hoc Comparisons for Intervention Phase for Total Score

		Placebo		Active	
		pre <i>p</i>	post <i>p</i>	pre <i>p</i>	post <i>p</i>
<hr/>					
Placebo					
	pre	-	.20	.09	.01
	post	.20	-	.02	.07
Active					
	pre	.09	.02	-	.001
	post	.01	.07	.001	-

Table M14
Post hoc Comparisons for Intervention Phase for Total Number of Problems

		Placebo		Active	
		pre <i>p</i>	post <i>p</i>	pre <i>p</i>	post <i>p</i>
<hr/>					
Placebo					
	pre	-	.16	.30	.02
	post	.16	-	.06	.13
Active					
	pre	.30	.06	-	.006
	post	.02	.13	.006	-

Table M15
Means for Behavioural Intervention x Intervention Phase Interaction For Total Score and Total Number of Problems

Group	Intervention Phase	Total (<i>M</i>)	Problems (<i>M</i>)
<hr/>			
Support			
	pre	31.56	11.00
	post	26.94	8.63
Active			
	pre	37.75	12.75
	post	20.13	6.00

Table M16
MANCOVA Results for Inattention Score
and Number of Inattention Problems

Factor	<i>F</i>	df 1	df 2	<i>p</i>
pharmacotherapy (1)	5.20	2	10	.03
behavioural intervention (2)	1.28	2	10	.32
intervention phase (3)	9.76	2	11	.00*
1 x 2	1.09	2	10	.37
1 x 3	2.13	2	11	.17
2 x 3	13.11	2	11	.00**
1 x 2 x 3	4.89	2	11	.03

Note. * indicates $p=.004$; ** indicates $p=.001$

Table M17
Means for Pharmacotherapy x Behavioural Intervention x Intervention Phase
Interaction for Inattention Score and Number of Inattention Problems

Treatment component	Group	Intervention Phase	Total (<i>M</i>)	Problems (<i>M</i>)
P/therapy	Placebo	pre	12.25	4.50
		post	13.38	4.50
	Active	pre	18.38	5.75
		post	3.17	0.00
Behav.Int	Support	pre	19.00	6.50
		post	18.00	5.75
	Training	pre	14.25	4.25
		post	10.00	2.75

Table M18
*Post hoc Comparisons for Treatment Components x Intervention Phase Interaction
 for Inattention Score*

	Pharmacotherapy –active				Pharmacotherapy - placebo			
	Parent support		Parent training		Parent support		Parent training	
	pre <i>p</i>	post <i>p</i>	pre <i>p</i>	post <i>p</i>	pre <i>p</i>	post <i>p</i>	pre <i>p</i>	post <i>p</i>
P/therapy - active								
Parent support								
pre	-	.62	.10	.004	.08	.09	.65	.33
post	.62	-	.16	.003	.14	.13	.70	.31
Parent training								
pre	.10	.16	-	.0004	.78	.87	.19	.02
post	.004	.003	.0004	-	.0004	.0004	.002	.009
P/therapy - placebo								
Parent support								
pre	.08	.14	.78	.0004	-	.89	.19	.02
post	.09	.13	.87	.0004	.89	-	.11	.02
Parent training								
pre	.65	.70	.19	.002	.19	.11	-	.27
post	.33	.31	.02	.009	.02	.02	.27	-

Table M19
*Post hoc Comparisons for Treatment Components x Intervention Phase Interaction
 for Number of Inattention Problems*

	Pharmacotherapy -active				Pharmacotherapy - placebo			
	Parent support		Parent training		Parent support		Parent training	
	pre <i>p</i>	post <i>p</i>	pre <i>p</i>	post <i>p</i>	pre <i>p</i>	post <i>p</i>	pre <i>p</i>	post <i>p</i>
P/therapy - active								
Parent - support								
Pre	-	*	.56	.01	.48	.73	.84	.34
post	*	-	.32	.02	.38	.56	.98	.47
Parent - training								
pre	.56	.32	-	.005	.81	*	.61	.15
post	.01	.02	.005	-	.003	.006	.01	.04
P/therapy - placebo								
Parent - support								
pre	.48	.38	.81	.003	-	.54	.46	.09
post	.73	.56	*	.006	.54	-	.72	.20
Parent - training								
pre	.84	.98	.61	.01	.46	.72	-	.23
post	.34	.49	.15	.04	.09	.20	.23	-

Note: *=1.00

Table M20
*MANCOVA Results for Hyperactivity-Impulsivity Score
 and Number of Problems*

Factor	<i>F</i>	df 1	df 2	<i>p</i>
pharmacotherapy (1)	0.23	2	10	.80
behavioural intervention (2)	0.99	2	10	.41
intervention phase (3)	7.60	2	11	.00*
1 x 2	3.56	2	10	.07
1 x 3	3.63	2	11	.06
2 x 3	0.45	2	11	.65
1 x 2 x 3	1.51	2	11	.26

Note. * indicates $p=.009$

Table M21
Means for Intervention Phase for Hyperactivity-Impulsivity Score and Number of Problems

Intervention Phase	Total (<i>M</i>)	Problems (<i>M</i>)
pre	18.69	6.63
post	12.40	4.06

Post hoc comparisons for both variables significant, $p=.002$

3. Rating Scale IV (A) – Parent version

Table M22
*MANCOVA Results for Total Score and
 Total Number of Problems*

Factor	<i>F</i>	df 1	df 2	<i>p</i>
pharmacotherapy (1)	1.02	2	10	.40
behavioural intervention (2)	1.04	2	10	.39
intervention phase (3)	1.27	4	9	.35
1 x 2	1.71	2	10	.23
1 x 3	1.09	4	9	.42
2 x 3	0.58	4	9	.69
1 x 2 x 3	0.52	4	9	.73

4. Rating Scale IV (A) – Teacher version

Table M23

MANCOVA Results for Total Score and Total Number of Problems

Factor	<i>F</i>	df 1	df 2	<i>p</i>
pharmacotherapy (1)	0.64	2	10	.55
behavioural intervention (2)	0.52	2	10	.61
intervention phase (3)	3.25	2	11	.08
1 x 2	1.24	2	10	.33
1 x 3	0.94	2	11	.42
2 x 3	0.94	2	11	.42
1 x 2 x 3	3.35	2	11	.07

5. Conners' Rating Scale – Parent version

Table M24

MANCOVA Results for Oppositional Subscale and Global Index

Factor	<i>F</i>	df 1	df 2	<i>p</i>
pharmacotherapy (1)	0.41	2	10	.67
behavioural intervention (2)	1.54	2	10	.26
intervention phase (3)	5.57	2	11	.02
1 x 2	1.25	2	10	.33
1 x 3	1.08	2	11	.37
2 x 3	0.60	2	11	.57
1 x 2 x 3	1.60	2	11	.25

Table M25

Means for Intervention Phase for Oppositional Subscale and Global Index

Intervention Phase	Oppositional Subscale (<i>M</i>)	Global Index (<i>M</i>)
pre	75.31	73.50
post	71.19	73.06

Post hoc comparisons for both variables are nonsignificant.

6. Conners' Rating Scale-Teacher version

Table M26
MANCOVA Results for Oppositional Subscale and Global Index

Factor	<i>F</i>	df 1	df 2	<i>p</i>
pharmacotherapy (1)	0.58	2	10	.58
behavioural intervention (2)	0.42	2	10	.67
intervention phase (3)	8.62	2	11	.00*
1 x 2	2.70	2	10	.12
1 x 3	1.05	2	11	.38
2 x 3	0.28	2	11	.77
1 x 2 x 3	1.91	2	11	.19

Note. * indicates $p=.006$.

Table M27
Means for Intervention Phase for Oppositional Subscale and Global Index

Intervention Phase	Oppositional Subscale (<i>M</i>)	Global Index (<i>M</i>)
pre	71.38	75.94
post	63.31	65.46

Post hoc comparisons for Oppositional subscale are nonsignificant.
Post hoc comparisons for Global Index are significant, $p=.001$.

7. Conners' Kiddy Continuous Performance Test

Table M28
MANCOVA Results for % Omissions and %Commissions

Factor	<i>F</i>	df 1	df 2	<i>p</i>
pharmacotherapy (1)	0.58	2	10	.58
behavioural intervention (2)	3.34	2	10	.08
intervention phase (3)	7.29	2	11	.01
1 x 2	3.30	2	10	.08
1 x 3	5.95	2	11	.02
2 x 3	3.35	2	11	.07
1 x 2 x 3	6.22	2	11	.02

Table M29
*Means for Intervention Phase for % Omissions
 and % Commissions*

Intervention Phase	Omissions (M)	Commissions (M)
pre	34.94	46.25
post	29.00	35.75

Table M30
*Means for Pharmacotherapy x Behavioural Intervention x Intervention
 Phase Interaction for % Omissions and % Commissions*

	Omissions (M)	Commissions (M)
Pharmacotherapy – active		
Parent – support		
pre	61.75	30.50
post	52.75	36.50
Parent – training		
pre	33.75	49.00
post	5.50	22.00
Pharmacotherapy – placebo		
Parent - support		
pre	20.25	59.00
post	29.00	42.00
Parent- training		
pre	24.00	46.50
post	28.75	42.50

Table M31

Post hoc Comparisons for Pharmacotherapy x Behavioural Intervention x Intervention Phase Interaction for % Omissions

	Pharmacotherapy - active				Pharmacotherapy - placebo			
	Parent support		Parent training		Parent support		Parent training	
	pre <i>p</i>	post <i>p</i>	pre <i>p</i>	post <i>p</i>	pre <i>p</i>	post <i>p</i>	pre <i>p</i>	post <i>p</i>
Pharmacotherapy - active								
Parent - support								
pre	-	.42	.06	.004	.03	.05	.04	.07
post	.43		.11	.01	.09	.12	.12	.18
Parent - training								
pre	.06	.11	-	.17	.73	.67	.81	.89
post	.004	.01	.17	-	.20	.26	.25	.20
Pharmacotherapy - placebo								
Parent - support								
pre	.03	.09	.73	.20	-	.85	.74	.72
post	.05	.16	.67	.26	.85	-	.89	.98
Parent- training								
pre	.04	.12	.81	.25	.74	.89	-	.67
post	.07	.18	.89	.20	.72	.98	.67	-

All post hoc comparisons for percentage Commissions are nonsignificant.

8. Parent Acceptance Rejection Questionnaire (PARQ) -Total & Family Environment Scale (FES) - Relationship Index

Table M32

MANCOVA Results for PARQ-Total and FES-Relationship Index

Factor	<i>F</i>	df 1	df 2	<i>p</i>
pharmacotherapy (1)	2.61	2	10	.12
behavioural intervention (2)	0.01	2	10	.99
intervention phase (3)	4.20	2	11	.04
1 x 2	3.36	2	10	.08
1 x 3	0.94	2	11	.42
2 x 3	1.20	2	11	.34
1 x 2 x 3	2.46	2	11	.13

Table M33
*Means for Intervention Phase for PARQ-
 Total and FES-Relationship Index*

Intervention Phase	PARQ (M)	FES (M)
pre	103.47	16.07
post	99.83	18.05

Post hoc comparisons for Parent Acceptance Rejection Questionnaire-total are nonsignificant ($p=.26$). Post hoc comparisons for Family Environment Scale-Relationship Index are significant, $p=.03$.

9. Behavioural observation of parent/child interaction – Compliance task

Table M34
MANCOVA Results for Repeat Commands, % Child Compliance and % Child Negative

Factor	F	df 1	df 2	p
pharmacotherapy (1)	0.95	3	9	.45
behavioural intervention (2)	2.62	3	9	.11
intervention phase (3)	4.47	3	10	.03
1 x 2	0.29	3	9	.83
1 x 3	1.45	3	10	.29
2 x 3	0.33	3	10	.80
1 x 2 x 3	0.10	3	10	.96

Table M35
Means for Intervention Phase on Repeat Commands, % Child Compliance and % Child Negative

Intervention Phase	No. repeat commands (M)	Child compliance (M%)	Child negative (M%)
pre	0.61	60.25	10.47
post	0.29	77.40	7.99

Post hoc comparisons for repeat commands and percentage child compliance are significant, $p=.02$ and $p=.03$, respectively.

Post hoc comparisons for percentage child negative are nonsignificant ($p=.67$).

10. Behavioural observation of parent/child interaction – Attention task

Table M36
MANCOVA Results for Off-task, Vocalising and Total

Factor	<i>F</i>	df 1	df 2	<i>p</i>
pharmacotherapy (1)	0.29	3	9	.83
behavioural intervention (2)	1.19	3	9	.37
intervention phase (3)	0.80	3	10	.52
1 x 2	0.54	3	9	.67
1 x 3	1.78	3	10	.21
2 x 3	0.36	3	10	.79
1 x 2 x 3	0.48	3	10	.70

Table M37
MANCOVA Results for Playing with Object, Out of Seat and Total

Factor	<i>F</i>	df 1	df 2	<i>p</i>
pharmacotherapy (1)	0.34	3	9	.80
behavioural intervention (2)	1.74	3	9	.23
intervention phase (3)	1.62	3	10	.25
1 x 2	0.41	3	9	.75
1 x 3	0.61	3	10	.62
2 x 3	0.33	3	10	.80
1 x 2 x 3	1.07	3	10	.40

Table M38
MANCOVA Results for Fidgeting and Total

Factor	<i>F</i>	df 1	df 2	<i>p</i>
pharmacotherapy (1)	1.03	2	10	.39
behavioural intervention (2)	1.51	2	10	.27
intervention phase (3)	2.60	2	11	.12
1 x 2	0.04	2	10	.96
1 x 3	1.75	2	11	.22
2 x 3	0.43	2	11	.66
1 x 2 x 3	3.56	2	11	.06

APPENDIX N

Difference in scores and degree of change on ADHD Rating Scale –Parent and Teacher Versions

Table N1

Difference between Pre-intervention and During-intervention Scores and Reliable Change Index for ADHD Rating Scale-Parent Version

Participant	Total Score		Inattention		Hyperactivity-Impulsivity	
	Difference	RCI	Difference	RCI	Difference	RCI
1a	18.50	3.39	8.50	2.52	10.00	3.40
1b	4.00	0.73	2.00	0.59	2.00	0.68
1c	0.00	0.00	0.00	0.00	0.00	0.00
1d	22.00	4.03	6.50	1.93	15.50	5.27
2a	16.00	3.58	3.00	1.01	13.00	5.44
2b	23.00	4.21	14.00	4.15	9.00	3.06
2c	2.00	0.37	+3.00	+0.89	5.00	1.70
2d	5.50	1.01	2.50	0.74	3.00	1.02
3a	+1.00	+0.18	+2.00	+0.59	1.00	0.34
3b	+4.00	+0.89	0.00	0.00	+4.00	+1.67
3c	+5.00	+1.12	+4.00	+1.35	+1.00	+0.42
3d	+10.00	+1.83	+5.00	+1.48	+5.00	+1.70
4a	+1.00	+0.18	0.00	0.00	+1.00	+0.34
4b	3.00	0.55	5.00	1.48	+2.00	+0.68
4c	+5.00	+0.92	+4.00	+1.19	+1.00	+0.34
4d	2.00	0.37	0.50	0.15	1.50	0.51

Note: + indicates score increased, i.e., level of ADHD was more severe.

Table N2

Number of Participants Showing Various Degrees of Change between Pre and During Measures on ADHD Rating Scale-Parent Version for Each Intervention Group (n)

Group	Significantly Worse	Worse	Same	Better	Significantly Better
Total score					
1			1	1	2
2				2	2
3		4			
4		2		2	
Inattention					
1			1	2	1
2		1		2	1
3		2	1	1	
4		1	1	2	
Hyperactivity-Impulsivity					
1			1	1	2
2				2	2
3		3		1	
4		3		1	

Table N3

Difference between During-intervention and Post-intervention Scores and Reliable Change Index for ADHD Rating Scale-Parent

Participant	Total Score		Inattention		Hyperactivity-Impulsivity	
	Difference	RCI	Difference	RCI	Difference	RCI
1a	+16.50	+3.02	+8.50	+2.52	+8.00	+2.72
1b	15.00	2.75	7.00	2.08	8.00	2.72
1c	10.00	1.83	8.00	2.37	2.00	0.68
1d	+2.50	+0.46	+0.50	+0.15	+2.00	+0.68
2a	+10.00	+2.24	+3.00	+1.01	+7.00	+2.93
2b	7.00	1.28	2.00	0.59	5.00	1.70
2c	+12.00	+2.20	+5.00	+1.48	+7.00	+2.38
2d	+4.50	+0.82	+2.00	+0.59	+2.50	+0.85
3a	1.00	0.18	2.00	0.59	+1.00	+0.34
3b	14.00	3.13	6.00	2.03	8.00	3.35
3c	5.00	1.12	2.00	0.68	3.00	1.25
3d	1.00	0.18	0.00	0.00	1.00	0.34
4a	0.00	0.00	0.00	0.00	0.00	0.00
4b	1.00	0.18	0.00	0.00	1.00	0.34
4c	+3.00	+0.55	+1.00	+0.30	+2.00	+0.68
4d	+2.00	+0.37	+6.00	+1.78	4.00	1.36

Note: + indicates score increased, i.e., level of ADHD was more severe.

Table N4

Number of Participants Showing Various Degrees of Change Between During and Post Measures on ADHD Rating Scale-Parent Version for Each Intervention Group (n)

Group	Significantly Worse	Worse	Same	Better	Significantly Better
Total score					
1	1	1		1	1
2	2	1		1	
3				3	1
4		2	1	1	
Inattention					
1	1	1			2
2		3		1	
3			1	2	1
4		2	2		
Hyperactivity-Impulsivity					
1	1	1		1	1
2	2	1		1	
3		1		2	1
4		1	1	2	