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LA THÈSE A ÉTÉ
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COPING STYLES
OF
PARENTS OF HYPERACTIVE CHILDREN

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THESIS

Submitted in Partial Fulfillment
of the Requirements for the Degree of
Master of Arts,

School of Graduate Studies
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Abstract

The aim of this study was to provide an empirical investigation of the psychological coping styles of parents of hyperactive children. This question was examined through the use of psychometric instruments which provide an actuarial profile of the nature and effectiveness of the behaviours which the parent utilizes to cope with psychological stress. Nineteen hyperactive boys aged five to twelve inclusive, undergoing treatment at the Children's Hospital of Eastern Ontario, and their parents were selected for study. Two major variables were isolated through the use of control groups: first, the degree of behavioural versus physiological involvement in the illness. In order to control for this, eighteen asthmatic boys and their parents were chosen for parallel study, childhood asthma with its significant physical loading presenting a meaningful contrast to hyperactivity along a physiological/behavioural continuum of chronic illness in childhood. Secondly, in order to control for the chronicity variable, nineteen boys presenting to a general paediatric clinic for short-term treatment of a minor ailment, and their parents, were included into a "normal" control group. Five significant control variables were included in the study: the parents' age, level of education, level of intellectual functioning and cognitive efficiency, and the gross family income for 1980.

Results of multivariate analyses of covariance of scores obtained by mothers of hyperactive, asthmatic control and normal control children suggest that the mother of the hyper-

active child faces a greater problem of psychological adjustment than mothers of asthmatic and normal control children. She tends to cope with the ongoing stresses in her life with denial and repression of underlying conflicts and a tendency to blame her difficulties on outside circumstances. She reacts to a felt reduction of her parenting skills by turning the feelings of anger and disappointment inwards. Although she continues to strive for mastery of her problems, her psychological well-being is affected in several ways: she is somewhat depressed, with a decrease in self-esteem and a general oversensitivity to her environment.

The overall pattern of psychological adjustment of fathers of hyperactive children does not differ significantly from that of fathers of the other groups. Fathers of hyperactive children use their intellectual resources somewhat less efficiently than fathers of normal control children. Although the overall level of psychological defensiveness in parents of asthmatic children is parallel to that of parents of hyperactive children, they utilize a different coping style characterized by a moderate tendency to withdraw from social situations, and a discomfort with interpersonal relationships which may contribute to a degree of dissatisfaction with marital adjustment.

TABLE OF CONTENTS

	<u>PAGE</u>
ACKNOWLEDGEMENTS	ii
ABSTRACT	iii
TABLE OF CONTENTS	v
LIST OF TABLES	vi
LIST OF APPENDICES	viii
CHAPTER I - INTRODUCTION	1
Parent-Child Interaction in Hyperactivity	1
Parent-Child Interaction in Childhood Asthma	13
Familial Reactions to Chronic Childhood Illness ...	16
Summary of the Literature	20
Objectives of the Study	22
Choice of Instrument	24
Hypotheses	24
CHAPTER II - METHOD	27
Subjects	27
Rating Scales	29
Procedure	42
Ethical Considerations	43
Measures	43
CHAPTER III - RESULTS	46
CHAPTER IV - DISCUSSION	
Analysis of Control Variables	77
Analysis of Dependent Variables	81
Conclusion	93
APPENDICES	99
REFERENCES	108

LIST OF TABLES

<u>TABLE</u>	<u>DESCRIPTION</u>	<u>PAGE</u>
1	Analysis of Variance of Mean Scores Obtained by Parents of Hyperactive, Normal Control and Asthmatic Control Children on Control Variables	51
2	Means, Standard Deviations and Post-hoc Comparisons for Control Variables Describing Parents of the Three Groups of Children	52
3	Analysis of Variance of Mean Scores Obtained by Mothers of Hyperactive, Normal Control, and Asthmatic Control Children on Control Variables	54
4	Means, Standard Deviations and Post-hoc Comparisons for Control Variables Describing Mothers of the Three Groups of Children	55
5	Analysis of Variance of Mean Scores Obtained by Fathers of Hyperactive, Normal Control and Asthmatic Control Children on Control Variables	57
6	Means, Standard Deviations and Post-hoc Comparisons for Control Variables Describing Fathers of the Three Groups of Children	58
7	Regression Weights of Dependent Variables Describing Parents of the Three Groups of Children on Orthogonal Factors in Varimax Rotated Factor Matrix	60
8	Eigenvalues and Percent of Variance Accounted for by Factors in Initial Factor Matrix Obtained through Factor Analysis of Dependent Variables Describing Parents of Hyperactive, Asthmatic and Normal Control Children	61
9	Multivariate Analyses of Covariance of Mean Scores Obtained by Parents of the Three Groups of Children on Subscales of Dependent Variable Factors	64
10	Univariate Analyses of Covariance of Mean Scores Obtained by Parents of Hyperactive, Normal Control and Asthmatic Control Children on Subscales of Dependent Variable Factors	65

LIST OF TABLES (cont'd)

<u>TABLE</u>	<u>DESCRIPTION</u>	<u>PAGE</u>
11	Mean Scores Adjusted for Covariates and Post-hoc Comparisons for Dependent Variables Describing Parents of Hyperactive, Asthmatic and Normal Control Children	66
12	Univariate Analyses of Covariance of Mean Scores Obtained by Mothers Pooled Together and Fathers Pooled Together on Subscales of Dependent Variable Factors	67
13	Mean Scores Adjusted for Covariates for Dependent Variables Describing Mothers Pooled Together and Fathers Pooled Together of the Three Groups of Children	68
14	Univariate Analyses of Covariance of Mean Scores Obtained by Mothers of Hyperactive, Normal Control and Asthmatic Control Children on Subscales of Dependent Variable Factors	69
15	Mean Scores Adjusted for Covariates and Post-hoc Comparisons for Dependent Variables Describing Mothers of Hyperactive, Asthmatic and Normal Control Children	70
16	Univariate Analyses of Covariance of Mean Scores Obtained by Fathers of Hyperactive, Normal Control and Asthmatic Control Children on Subscales of Dependent Variable Factors	71
17	Mean Scores Adjusted for Covariates and Post-hoc Comparisons for Dependent Variables Describing Fathers of Hyperactive, Normal Control and Asthmatic Control Children	72

LIST OF APPENDICES

<u>APPENDIX</u>	<u>DESCRIPTION</u>	<u>PAGE</u>
A	Letter Sent to Parents of Hyperactive, Asthmatic and Normal Control Children	99
B	Informed Consent Form Signed by Parents in the Study	101
C	Release of Information Form Signed by Parents in the Study	102
D	Raw Scores Obtained by Parents of Hyperactive, Asthmatic and Normal Control Children on Dependent Variables in the Study	103
E	Raw Scores Obtained by Fathers Pooled Together and Mothers Pooled Together on Dependent Variables in the Study	104
F	Raw Scores Obtained by Mothers of the Three Groups of Children on Dependent Variables	105
G	Raw Scores Obtained by Fathers of the Three Groups of Children on Dependent Variables	106
H	Age, Peabody IQ and Connors Hyperkinesis Scores Obtained by Hyperactive, Normal Control and Asthmatic Control Children	107

CHAPTER I

Introduction

Parent-Child Interaction in Hyperactivity

The term hyperkinesis dates back to the early work of Strauss and Lehtinen in the 1940's who in their attempt to distinguish between exogenous and endogenous retardation, identified a subgroup of "hyperkinetic syndrome" composed of hyperactive, distractable, uninhibited, impulsive, erratic and uncoordinated behaviour. Since the publication of that classic work, the core of behaviours termed "hyperkinetic syndrome" has been represented by at least forty different labels (Cruikshank, 1971). This diversity in labels underlines the present lack of certainty regarding the etiology of this disorder. The name "minimal brain damage" suggests the presence of actual central nervous system impairment, while "minimal brain dysfunction" reflects a more recent view suggesting the presence of neurophysiological or neurochemical dysfunction. A number of purely descriptive labels have also been utilized, including such terms as "hyperkinetic impulse disorder" and "hyperkinetic child syndrome" (Weiss and Hechtman, 1979).

The diagnostic criteria⁷ for hyperactivity consists of a cluster of symptoms present in the child since early life. The present DSM III diagnostic criteria include those of excessive general hyperactivity or motor restlessness, difficulty in sustaining attention, impulsive

behaviour interfering with school performance and social activities, low frustration tolerance, and lastly, duration of these symptoms for at least one year (Weiss and Hechtman, 1979). Recent work by Firestone and Martin (1979) has indicated that of this cluster of traits, the sole significant factor in differentiating hyperactive children from other disturbed groups is that of attentional deficits.

Hyperactivity is identified as the major form of behavioural disturbance in children. It is found to occur in 3 to 6 per cent of grade school children, in a male to female ratio of 4 to 1 (Paine, 1968). As stated above, the question of its etiology is at present controversial and only partly understood, and the role and interaction of various biological, psychological, social and environmental factors has been suggested (Bowen and Mercer, 1975).

The major form of pharmacological treatment for hyperactivity consists of the long-term administration of central nervous system stimulants, methylphenidate hydrochloride (Ritalin) and deoxthroamphetamine (Dexedrine).

In contrast to the traditionally held hypotheses linking the presumed mechanism of action of these drugs to a paradoxical quieting effect on the hyperactive children, recent research has shown that the improvements

in motor and cognitive performance resulting from the administration of stimulant drugs are in fact secondary to an enhancement in attentional processes which these drugs produce in both normal and hyperactive children (Weingartner, Rapoport, Buchsbaum, Bunney, Ebert, Mikkelsen and Laine, 1980).

Other treatment approaches include the use of behaviour therapy as well as parental counselling and remedial educational methods. The vast amount of research work on hyperactivity in the past decade has in fact chosen these areas of etiology, diagnosis, and treatment of hyperactivity as major foci of interest. It is only a handful of investigations which have directed themselves towards the study of the parent of the hyperactive child--the area of interest of the present investigation. This small group of studies could be viewed as falling within three somewhat distinct areas of concern.

The first of these concerns is that of an attempt at identifying a fundamental genetic predisposition towards mental illness in families of hyperactive children. With this aim in mind, Morison and Stewart (1971), conducted a systematic semi-structured psychiatric examination of the parents of 59 hyperactive and 41 normal control

children. A significantly higher prevalence of psychiatric illness was found in the "hyperactive" group. Specifically, a higher incidence of alcoholism and sociopathy was found in fathers of hyperactive children, and a higher incidence of alcoholism and hysteria was found in the mothers.

In a similarly designed psychiatric assessment of the parents of 50 hyperactive and 50 normal matched controls, Cantwell (1972) obtained comparable results for fathers of the hyperactive group, and significant scores for hysteria in mothers.

These studies are limited by their use of a single observer and of non-standardized interview techniques as well as by the lack of control for observer bias. However, they are useful in providing a pioneering set of epidemiological investigations which, in addition to providing support for the "genetic" theories of hyperactivity through the suggestion of a possible transmission of a general predisposition towards psychopathology, a theory which must be further investigated through adoption and twin studies, does also provide some tentative evidence for the existence of significant psychiatric illness in the parents of hyperactive children.

A study concurrently carried out at the School of Psychology of the University of Ottawa and the Children's Hospital of Eastern Ontario by Alberts and Firestone, is using a standardized and psychometric procedure in an investigation of the psychological and behavioral characteristics of both parents of hyperactive children and the children, with a particular interest in the question of the genetic loading in hyperactivity. In order to control for the variable of natural versus adoptive parenting, they are examining the characteristics of both natural and adopted hyperactive children and their parents. They have also included a second, normal control factor for both their adopted and hyperactive groups. The inclusion of this control group illustrates the major distinction in focus of this study from the Alberts and Firestone study.

A second approach has chosen as a focus of interest the mother-hyperactive child interaction within a standardized problem-solving situation. As an extension of previously reported studies in which a high level of maternal involvement on a structured task had been reported in distractable children (Bee, 1967) and children with poor spatial ability (Bing, 1963), Campbell (1972) examined the interaction between mother and hyperactive child in the context of a cognitive task while focusing on the variables

of the child's impulse control and cognitive style as well as the mother's expectation of success or failure of the child on the task. Thirty grade two and three boys, matched for age, were divided into a reflective, a hyperactive, and an impulsive group, in accordance with their scores on Kagan's (1971) measure of cognitive response style. Children were observed in individual interaction with their mothers while asked to resolve two easy and two difficult tasks presented in counter-balanced order. Maternal and child behaviour was coded in ten second intervals into the following categories: approval, disapproval, suggestion, encouragement, impulse control suggestions, and direct physical help. Child behaviour variables were the following: comments on task and on performance, request for maternal feedback, for examiner feedback and for help, and rejection of help. Mothers were then given a structured interview.

It was found that mothers of all three groups of subjects interacted more with their children during the difficult than the easy tasks. Although mothers of the hyperactive children did not engage in significantly more interaction than the other mothers, they showed a different characteristic pattern of interaction providing significantly more direct physical help, encouragement

and impulse control suggestions. They were found to be supportive rather than punitive or intrusive. Hyperactive children were found to interact more than other subjects on difficult tasks and to make more comments on the tasks and on their own performance.

The results of this study were interpreted in the perspective of a mother-child interaction model of maternal behaviour, whereby the mother's behaviour towards the child is considered to be a response to the child's actual behaviour in the situation. The differential responsiveness of the mother of the hyperactive children in this study towards varying task difficulties is construed as reflective of her tendency to structure tasks in response to the child's ability to focus attention, control impulsivity, and persist. Hand in hand with this, the child's differential responsiveness along the variable of task difficulty is taken to be a possible signal to the mother to intervene and provide the necessary support.

The results of this study have received additional support in a later study (Campbell, 1975) of mother-child interaction in a similar problem-solving situation, this time utilizing a subject group of 39 boys equally divided into a hyperactive, a "learning-disabled", and a normal control group.

Representative of a relatively divergent theoretical framework is the Cunningham and Barkley (1979) study of the mother-child interactions in 15-minute free-play and structured-task situations. Subjects consisted of 20 normal and 20 hyperactive boys ranging in age from six to twelve years. The experimental design was aimed at improving upon the Campbell (1973, 1975) designs in two respects: first, the mother and child behaviours were coded in a series of antecedent-consequent behavioural units, rather than independently, and secondly, the addition of an unstructured setting for further observation of interactional characteristics. It was found that the mothers of the hyperactive boys provided fewer positive responses and spent significantly more time attempting to control, direct or restructure their children's activities than the control mothers, both in the structured tasks and in the free-play situations. The results were taken to suggest the presence of a generalized controlling and intrusive management strategy in the mothers of the hyperactive children which, while initially occurring in response to the child's overactive, impulsive, and inattentive style, may in fact further exacerbate the child's behavioural problems. It was further suggested that these mothers may have acquired a generalized set of expectations about their

children which would adversely influence their responses to the child, and that their infrequent use of praise, interest and attention towards their children may contribute towards the child's disruptive behaviours purportedly aimed at eliciting maternal attention.

Aimed at a further clarification of the potentially circular question of the respective causal roles of parenting style and the hyperactive child's cognitive style, Humphries, Kinsbourne and Swanson (1978) utilized an ingenious experimental paradigm which falls into a third related area of interest in these studies, that of the parent-child interactions as related to the responses of the hyperactive child to the administration of stimulant drug medication. Working with a group of 26 hyperactive children, including 18 boys and 8 girls with a mean age of 10.2 years, Humphries et al. utilized the following paradigm: Mother-child interaction was observed in the unmedicated (placebo) child, in the context of two maze-tracking tasks, an easy and a more difficult one. Then, one to two hours subsequent to methylphenidate administration, when improved task performance was expected to have occurred, the mother-child interaction was again observed. A double-blind, counter-balanced design was utilized. It was found that mothers gave out significantly more controlling instructions in the difficult than in the easy placebo

tasks (a finding congruent with those of Campbell, 1973, 1975), and that a similar pattern was found to occur in the medicated conditions. These results were taken to give further support to the mother-child interactional model which purports that the mother's controlling behaviour towards the child, rather than consisting of a rigid and inflexible pattern, represents an adaptable response secondary to the child's disordered behaviour.

The question of the relationship between the mother's characteristic response style towards her hyperactive child and the child's typically "disruptive" cognitive behavioural style is thus clearly a highly complex one in which a dyadic interactional effect is likely to be in effect. Further research, integrating and developing previous experimental designs as well as adding parallel information gathered elsewhere in the study of hyperactivity, will be needed in order to shed greater light on this question.

Another set of investigators have examined the relationship between parent-child interaction and stimulant drug therapy from a different angle--that of the relationship between the child's responsiveness to the stimulant drugs and the parenting style. Working with a group of 83 hyperkinetic/minimal brain dysfunction boys, Whaley-Khahn and Loney (1977) looked at the parenting characteristics of

both mothers and fathers in relation to clinical responsiveness to methylphenidate administration. Self-esteem was evaluated by judges on the basis of a number of psychological and educational test reports, and rated on a five-point scale. On the basis of medical records, parenting characteristics were rated by judges on the Parental Attitude Research Inventory, and on the Loney (1975) four-point scale of parental firmness, consistency, simplicity and placidity. Self-report measures were also obtained in structured interviews.

Five significant predictors of self-esteem were identified through multiple regression of the measures. Included was higher hostility in mothers. Four predictors of initial responsiveness to central nervous system stimulant medication were found, including greater inattention in the child, reported maternal shortcomings, rated love in the father and finally, the mother not describing herself as too soft-tempered.

In a related study, Conrad and Insel (1967) attempted to identify the characteristics of the parents of 31 hyperactive children who were responding favourably to amphetamine therapy. Information was gathered regarding the question of the child's interpersonal and social environment. This was determined along three dimensions. Parents

were viewed as either, (1) grossly deviant - a category including such items as mental illness, promiscuity, and retardation, (2) socially incompetent, i.e. having a history of heavy drinking or contact with the police, and finally, (3) engaging in poor parental relations. A correlation was found between poor responsiveness to medication and parental classification in the categories of grossly deviant and socially incompetent. It was concluded that the quality of the parent-child relationship is directly related to drug responsiveness, although this effect may occur either directly or by affecting the child's diagnostic classification.

These studies, though limited by the use of questionnaire and self-report measures, the lack of control groups, and the failure to report specific psychological test results, represent an initial attempt at identifying one of the possible factors intervening in the hyperactive child's degree of responsiveness to stimulant drug therapy.

From this review of the portions of the research on hyperactivity which deals specifically with the characteristics of the parents of hyperactive children and their interactional styles with their children, it can be seen that these theoretically broad topics have only been touched upon through work in a small number of highly specific sub-

areas. We have some rather controversial hypotheses regarding the causal interactions between the hyperactive child's characteristically impaired cognitive style and the parents' (more specifically the mothers') characteristic response style to the child. We also have some tentative hypotheses regarding the relationships between the child's degree of responsiveness to stimulant medication and the parent's general parenting style.

Finally, we have, through the psychiatric studies, some tentative evidence for the increased incidence of psychiatric illness in the parents of hyperactive children.

Parent-Child Interaction in Childhood Asthma

Bronchial asthma represents a major form of psychophysiological respiratory illness. Asthma can be broadly defined as dyspnoea with wheezing. The asthmatic congestion is caused by a combination of bronchospasm, oedema and hypersecretion which lead to a low grade inflammatory thickening of the bronchial wall and a plugging of the bronchiolar lumens which produces the symptoms of asthma (Knapp, 1977).

The cause of asthma is not clear, though a genetic predisposition is presumed to operate. Recent experimental clinical evidence has suggested that psychological factors

can influence pulmonary function in asthma either adversely or beneficially. This mechanism may operate at the level of the hypothalamus and limbic system, the autonomic nervous system, where both parasympathetic and sympathetic activity may exacerbate or minimize immunological factors, and at the peripheral tissue level, where higher information converges on receptors and the activity of the cyclic nucleotides.

The major form of medical treatment of bronchial asthma is that of steroids, which have a powerful, non-specific anti-inflammatory action. However, the underlying asthmatic process is found to persist in this form of treatment, and the side-effects of continued steroid administration can be quite severe.

A wide variety of psychotherapeutic modalities have been applied to the treatment of asthma: the use of psychotropic drugs, suggestion and hypnosis, behavior modification, long-term psychoanalysis or psychotherapy, and group and family therapy (Knapp, 1977).

In 1976 there were 8.6 million asthmatics in the United States, over half of whom were children. Asthma is the major cause of chronic illness in children under age 17. It is the leading contributor of school absenteeism in children with chronic illness (Creer, Renne

and Christian, 1976). It is a disease which is particularly difficult to deal with due to its intermittent nature and to the need in many patients for prolonged hospitalization to permit observation and the development of an individual medical program. For these reasons, asthma lends itself to the study of chronic illness (Kinsman, Jones, Matus and Schum, 1976).

Since the early days of psychoanalytic and psychiatric research into psychosomatic disorders, the hypothesis of a psychological component in the etiology and maintenance of the asthmatic syndrome has been received with much consideration both in theoretical and applied literature. Starting with French and Alexander's (1941) unidimensional characterization of the "asthmatic mother", the psychological conceptualization of the psyche-soma interplay in the etiology of asthma has developed towards a focalization on the heterogeneity of factors, both constitutional and environmental, which may be at play. Such variables have been suggested as the valence of the allergic factors (eg. Purcell, Bernstein and Bukantz, 1961), the nature of the maternal responses to the child's symptoms (eg. Byrne and Murrell 1977, Davis 1975), and the psychodynamic characteristics of the family unit (Minuchin et al, 1977).

The adverse effect of childhood asthma on family life.

has been reported in the literature (eg. McLean and Ching, 1973). These effects range from excessive physical demands on parents such as sleepless nights and numerous trips to the doctor, a sense of chronic anxiety and frustration, and a severe exacerbation of underlying familial conflicts.

The factors of the prevalence of asthma in the realm of paediatric disorders, its chronic nature, its intermittent severity as well as its partial imperturbability to presently available treatment approaches, its adverse effects on both the social and academic adjustment of the child and on the overall functioning of the family unit, and finally its high physiological loading in contrast with hyperactivity's behavioral predominance, all support the choice of childhood asthma as a conceptually appropriate control group for the study of the psychological adjustment of the parents of hyperactive children.

Familial Reactions to Chronic Childhood Illness

Having thus presented a review of those portions of the literature on hyperactivity and childhood asthma which pertain to the question of the parent-child interactional characteristics, a word of mention must be made to the body of literature pertaining to the question of familial reaction to chronic illness in the child. The work in this area, largely of a theoretical and/or anecdotal nature,

had directed itself to the study of this question in a variety of childhood syndromes such as spina bifida cystica (eg. Hare, Laurence, Payne and Raunsley, 1966; Walker, Thomas and Russell, 1971), mental retardation (eg. Zuk, 1959, Waterman, 1948), Down's syndrome (Golden and Davis, 1974), and blindness (Fraiberg, 1971). Within this body of work, a number of papers stand out in that they provide a theoretical framework for the questions of (a) the nature of the crisis presented by the chronically ill child, and (b) the process of adaptation and adjustment which this necessitates on the family's part. The first of these is the Solnit and Stark (1961) psychoanalytically-based study of mothers of mentally retarded children. Briefly, the authors hypothesize the presence of a process of preparation for childbirth in which the mother forms an image of the expected baby, this being comprised of a composite representation of "self" and "love objects", and entailing a process of repetition and resolution of basic conflicts with her own mother. In response to the birth of the "deformed" child, a mourning process is described to ensue, in which the loss of the wishes and expectations of the child must occur. The behaviours characteristic of this mourning process are described as falling within a continuum

of possible pathologies ranging from the experience of guilt feelings which give way to an "exclusive and unremitting" dedication to the child's welfare to, at the other end of the continuum, an intolerance for the child, who poses such an intolerable injury to the narcissistic self that there is an almost irresistible impulse to deny her relationship to him/her. In a theoretically linked study of the maternal reaction to the birth of a physically deformed child, Lax (1972) describes this event as a unique trauma to the mother. Considered, as by Solnit and Start, as a narcissistic blow, the birth of the deformed infant is felt to result in both conscious and unconscious feelings of devaluation, resulting in a breakdown of self-esteem in which both the self and its product are completely stripped of their worth. The specific type of reaction which will occur is described as contingent on such factors as the mother's personality structure, her unconscious attitude towards the child, and her characteristic ways of dealing with conflict.

The final study of interest in this context is the Drotar, Baskiewicz, Kennell and Klaus (1975) study of the parental reactions to the birth of children with congenital malformations. Parents of twenty children with a variety of common malformations such as Down's syndrome, cleft palate, and extrophy of the bladder were interviewed. The

audio-taped transcripts of these interviews were analysed by "blind" judges and classified into lists with common features. The result of this analysis was the finding that the reaction of the parents to the birth of their child follows a characteristic sequence in five stages: first, a stage of shock, characterized by irrational behaviour, crying, and feelings of helplessness; secondly, a period of denial, whose intensity appears to be contingent on the visibility of the malformation; next, a period of sadness, anger and anxiety, accompanied by a hesitance as to attachment to the child, apparently related to a fear of loss of the child through death; fourth, a period of adaptation of varying length, whereby a weaning of intensity of the emotional reactions and an increase in felt comfort and ability to care for the infant are found. Finally, a complex period of reorganization, in which such issues as responsibility for the child's problems and relationship with the spouse -- which may have been characterized by either mutual rejection or increased closeness -- must be faced and dealt with, is encountered. Parents are described as varying both in the rate and the specific stages which they do cross, and the degree to which the demands inherent in each stage are appropriately met.

The studies thus outlined represent a sampling of the

existing literature on the question of the familiar reactions to childhood illness. Although limited by their methodological drawbacks and their heavy reliance on theory, they serve to illustrate the perspective of childhood chronic illness as a stressing or traumatic event to which the parents must adapt a perspective congruent with that espoused in the present study. The variability of this process of adaptation and its reliance on both personality characteristics of the parents, inherent elements in the adjustment process, as well as unique characteristics of the situation, are described.

Summary of the Literature

The onset of chronic illness in a child, whether at birth or at a later time, is described as a psychologically traumatic event for the child's parents which is manifested in a number of ways. The mother, who has carried and given birth to the child and may play the major parenting role, is particularly affected. She may feel that she has failed in the task of producing a healthy infant, or that she has not properly cared for her child. Both parents may undergo a loss of their wishes and expectations for the child, which must be resolved through a process of grief and readjustment.

The nature of this adjustment varies according to the parent's personality, the resources accessible to him, his

previous attitudes towards the child, and the particular problems associated with the illness. Some parents cope effectively with this process. Others cope, but at a high psychological cost. They become less efficient, depressed or experience chronic feelings of anger, frustration or anxiety. They feel a marked reduction in their self-esteem, or experience guilt feelings which lead them to become overprotective or devoted to the child. Others may develop ambivalent attitudes towards the child, withdraw emotionally from him, or deny their feelings about the situation.

Parents of hyperactive children are faced with a particularly difficult problem of adaptation. They are raising a child who suffers from a chronic and debilitating illness which has a detrimental effect on his social and academic development. The unusually high level of motor activity is disruptive not only to the child but for those around him. Clinicians who work with families of hyperactive children are familiar with the parents' complaints around problems of adjustment and the common symptoms of psychological distress which they report. Yet no clinical, empirical study to date has explored the question of the manner in which parents of hyperactive children cope with their child's illness.

Little can be drawn directly from the literature on this question. Only a handful of studies on hyperactivity have focused on the characteristics of the parents. Controversial information is obtained from the studies of maternal parenting style as observed in standardized problem-solving situations. Here the mother's characteristic manner of dealing with her child is described by two diverging points of view as either healthy, adaptive and geared towards meeting the child's ongoing needs, or as maladaptive, controlling and intrusive. The genetic studies, though lacking in standardized methodology, provide some tentative evidence for the presence of psychopathology in these parents. An increase of alcoholism and sociopathy in fathers, and alcoholism as well as hysteria in mothers, has been described. These studies have been taken tentatively to suggest the presence of a generalized genetic predisposition towards psychiatric illness in this group. Viewed from another angle they suggest the presence of a relatively maladjustive coping style, somewhat different for each sex-parent, for this group.

Objectives of this Study

The aim of this study is to provide an empirical, clinical investigation of the psychological coping styles of parents of hyperactive children. More specifically,

we are concerned with examining the characteristic manner in which parents of hyperactive children adjust and cope with the stresses of raising a hyperactive child. Two aspects of psychological coping style will be examined:

1. The particular types of behaviors which the parent utilizes to cope with the situation. In psychological terms, the characteristic defenses or psychological coping mechanisms which the parent has adopted.
2. The effectiveness of these behaviors in bringing about a successful adaptation. This will be viewed as being
 - a) directly proportional to the parent's level of control and satisfaction with his life, and b) inversely proportional to the level of psychological distress which he is experiencing.

A control group of children suffering from a form of chronic illness which provides a meaningful contrast to hyperactivity was identified in an attempt to isolate the unique characteristics of the parent of the hyperactive child. A group of asthmatic children and their parents was selected for parallel study since asthma presents a salient contrast for hyperactivity along a behavioral/physiological continuum. In order to isolate the patterns of psychological adjustment of the parents of hyperactive children from those children who are free of chronic

medical or psychological difficulties, a second age-matched normal control group was included.

Choice of instrument

The Minnesota Multiphasic Personality Inventory (MMPI) was selected as the major instrument in this study. It is a widely used objective personality measure which provides actuarial data based on a vast body of correlational studies. The studies link MMPI profile configurations with a large body of clinical information relating to symptom clusters and adjustment. The MMPI basic and special scales provide quantitative and qualitative information regarding the individual's psychological defense style as well as the presence and nature of psychological distress which he may be experiencing.

Hypotheses

1. Parents of hyperactive children utilize a higher intensity of "neurotic" defenses than the parents of the normal group. Their level of defensiveness is also higher than that of the asthmatic group, in view of the additional behavioral component which the parent of the hyperactive child must adapt to.

More specifically, parents of the hyperactive will utilize a higher level of repression and denial of their feelings and problems (reflected by MMPI scale 3). They will tend to express their psychological conflicts through physical symptoms

(Scale 1). They will adopt perfectionistic and obsessive-compulsive mechanisms in response to feelings of guilt, anxiety and self-doubt (Scale 7), show a tendency to over-react to minor concerns, and handle painful emotions by attempting to understand them in intellectual terms (R-S scale). Thus, MMPI scales 1, 3, 7, and the R-S scale will be significantly more elevated in the profiles of the hyperactive group than in the other two groups.

2. Parents of the hyperactive group will experience a significantly greater impairment of self-esteem and report a higher level of depressive symptoms than the other groups. Thus, Scale 2 will be significantly higher in the hyperactive group.

3. Parents of the hyperactive group will exhibit a greater level of frustration and dissatisfaction with their present life circumstances which is experienced directly through feelings of anger and bitterness (scale 4) or handled by a tendency to blame others for their problems and feel morally self-righteous (scale 6). Thus Scales 4 and 6 will be significantly higher in the hyperactive group than in the other two groups.

4. Parents of the hyperactive group will more frequently acknowledge a dissatisfaction with their overall adjustment, an inability to cope successfully with their problems, and a fear of loss of control over their lives (scale F). They will less frequently describe feelings of self-acceptance, mastery and control over their situation (low Scale K). Their personality profiles will objectively reflect an overall

lower level of adjustment (Total pathology score). Thus scales F and TP will be significantly higher, and scale K significantly lower in the hyperactive than the other two groups.

5. Mothers of the hyperactive group will experience a more pronounced impairment in self-esteem and a greater level of psychological distress than both fathers of the hyperactive group and all other parents. Thus, scales 2, 7, K and R-S will be significantly higher in mothers of the hyperactive group than in fathers of the hyperactive group (and in parents of the other groups as hypothesized above).

CHAPTER II

Method

Subjects

Fifty-six male children¹ ranging in age from five to twelve years inclusive and their respective parents, were included in the study. The families were made up of a mixed socio-economic group living in the Ottawa area and its vicinities, who had utilized the services of the Children's Hospital of Eastern Ontario (C.H.E.O.) within the past two years. All children obtained an IQ measure of at least 85 on the Peabody Picture Vocabulary Test. Only two-parent families were included in the study.² Children with a history of diabetes, epilepsy, and/or brain damage were excluded from the subject pool.

Three groups of subjects were selected for study:

(1) a hyperactive group, (2) an asthmatic control group, and (3) a "normal" control group.

¹ Male subjects were chosen in view of the much higher predominance of hyperactivity in males.

² Single parenthood, as a major familial stressing variable in its own right, might serve as a confounding factor and was thus excluded from the study.

1. The Hyperactive Group. Nineteen children and their families were included in this group. The following criteria were to be met: (a) The child was to have been referred to the Department of Psychology of the C.H.E.O. with a suspected diagnosis of hyperactivity made by the referring physician. (b) The child was to have been diagnosed as hyperactive by a registered psychologist. All of the DSM III criteria including excessive general hyperactivity or motor restlessness, difficulty in sustaining attention, impulsive behaviour interfering with school performance and social activities, low frustration tolerance, and duration of these symptoms for at least one year were to have been met. (c) A history of disciplinary problems such as tantrums, aggressive, destructive or oppositional behaviours would also be present. These behaviours would be both generalized and pervasive, occurring both at home and at school. (d) The above characteristics were to have been exhibited since prior to two-and-a-half years of age. (e) Finally, the child was to have obtained a score of 15 or higher on the Hyperkinesis Index of the Teachers Rating Scale (Goyette, Conners and Ulrich, 1978).

2. Asthmatic Control Group. Eighteen children and their families were selected from the list of patients who were hospitalized at the Children's Hospital of Eastern Ontario within the past year with the principal diagnosis of asthma. Scores obtained on the Goyette, Conners and Ulrich (1978) Hyperkinesis Index were to be 9 or lower. No previous history of hyperactivity or consultation with either psychological or psychiatric services was present.

3. "Normal" Control Group. Twenty children and their families were selected from a list of patients referred to and attending the C.H.E.O. out-patient medical clinics during the past year. They were seen at the hospital for either annual medical examinations or minor medical problems, such as abrasions, influenza, etc. They were to have had a maximum of two contacts with the clinic in the past year. Children diagnosed as suffering from any form of chronic illness were automatically excluded from this group. Scores obtained on the Goyette et al. (1978) Hyperkinesis Index were to be 9 or lower. No history of consultation with either psychological or psychiatric services was to be present.¹

Rating Scales

Scales Administered to Parents

1. The Shipley Institute of Living Scale. This test, more commonly referred to as the "Shipley Hartford Test", was originally developed by Shipley (1940a, 1940b) as a test of intellectual impairment or deterioration. It is a self-administered paper-and-pencil test which comprises a vocabulary and an abstraction test, each administered to the subject within a 10-minute period. The original measure obtained is the Conceptualization Quotient (CQ), which consists of the ratio of the subject's abstraction age to that of the "normal" person receiving his/her particular vocabulary score. This measure serves as an index of the degree of intellectual impairment.

Since its inception, this test has proven to be of great utility in a clinical setting by virtue of its documented value

¹ Approximately 25% of the families of children diagnosed as hyperactive at the C.H.E.O. declined to participate in the study. Approximately 35% of the families of asthmatic and normal control children who were contacted declined to take part in the study, and a further 20% failed to meet the inclusion criteria. 29

as brief estimator of the current level of intellectual functioning. A number of studies have found a high correlation to exist between the IQ estimate yielded by the Shipley Hartford Test and the IQ obtained on the WAIS. In a study of 30 V.A. psychiatric patients, aged 16 to 62, Sires and Simmons (1959) found a product-moment correlation of .90 between the Shipley Hartford and the WAIS. Wiens and Banaka (1960), in a study of 140 psychiatric patients aimed to replicate the Sires and Simmons study, found a correlation coefficient of .79. Next, in a population of 21 female and 30 male psychiatric patients with an average age of 29.2 years, Stone and Ramer (1965) found a correlation coefficient of .79. Finally, in a population of 290 psychiatric patients of mixed sex, diagnosis and socio-economic status, Paulson and Tien-Teh Lin (1970) found a correlation coefficient of .78. These studies all attest to the usefulness of the Shipley Hartford Test as a brief predictor of the level of intellectual functioning in an adult population.

2. The Locke-Wallace Marital Adjustment Test. This test was developed in 1959 by Locke and Wallace with the aim of assessing marital adjustment, defined as the degree of accommodation of the wife and husband to each other at a given time. It is a self-administering, paper and pencil test comprising 15 items dealing with the subject's perception of such areas as the degree of spouse agreement on a number of dimensions, satisfaction in the marriage,

similarity in interests etc. Scores are obtained by adding up the individual scores for each question on an ordinal scale, with a possible total score range of 0 to 158. A score of 100 has empirically been identified as a cut-off score for marital adjustment, with scores falling below this taken as indicative of marital maladjustment.

The original sample on which the test was standardized included 118 couples, described as predominantly white, Protestant, urban, white-collared and professional. Two subject subgroups of patients, identified as maladjusted and well-adjusted respectively, were utilized in the validity study. A high validity measure was found, with only 17 per cent of the maladjusted group obtaining scores over a cut-off score of 100, and 96 per cent of the well-adjusted group obtaining scores of at least 100. A high reliability was also found, with a reliability coefficient of .90 as computed by the split-half technique and corrected by the Spearman Brown formula.

A further study of the discriminant and criterion-related validity of the Locke-Wallace Marital Adjustment Test was provided in the Haynes, Follingstad and Sullivan study (1979) in which the test was administered to 13 married couples aged 20 to 60 of which 7 comprised a "dissatisfied" group seeking marital counselling at an

out-patient clinic, and 6 formed a "satisfied couple" volunteer group. It was found that 24 of the 26 subjects were correctly classified, with one-way analysis of variance between the 2 groups found to yield a significant difference at the one per cent level.

3. Minnesota Multiphasic Personality Inventory. The MMPI is a vastly used objective test of personality both in clinical and research work. Designed by Hathaway and McKinley (1940, 1943, revised 1951), its aim was "to provide an objective assessment of major personality characteristics affecting personal and social adjustment" (Hathaway and McKinley, 1951). Over the past four decades, an impressive array of MMPI correlational data has accumulated in the literature, allowing for an actuarial assessment of both the nature and extent of the subject's current psychiatric symptomatology and of his/her characteristic response style towards psychological stress.

The MMPI is a self-administered test requiring that the subject identify whether each of 550 short descriptive statements are either "true" or "false" as applied to him/her. The records are analysed through the use of ten clinical scales, originally named for the abnormal condition on which their construction was based, and now referred to by their abbreviation or code number: Hs (hypochondriasis),

D (depression), Hy (hysteria), Pd (psychopathic-deviate),
Mf (masculinity-femininity), Pa (paranoia), Pt (psychas-
thenia), Sc (schizophrenia), Ma (hypomania), and Si
(social introversion). There are also three validating
scales: L (lie), F (validity), and K (correction). Either
card or booklet forms are available. The paper-and-
pencil booklet form will be utilized here.

The Total Pathology Score

This MMPI special scale was devised by Streiner,
Woodward, Goodman and McLean (1973). Utilizing the scheme
outlined in Appendix E of Marks and Seeman (1963), a score
ranging from one to five is assigned to each MMPI scale de-
pending on its elevation. The sum of the scores for each
of the thirteen scales comprises the Total Pathology Score.

This score has been utilized as an index of comparison
between the MMPI and the Minimult (Streiner, Woodward, Goodman
and McLean, 1973). A very high correlation was found be-
tween the two inventories on this measure. Goodman, Streiner,
Bartolucci and Woodward (1978) used the Total Pathology Score
as an index of overall psychopathology in the comparison be-
tween hospitalized and ambulatory psychiatric patients.

The Repression Sensitization Scale

This scale is one of a number of MMPI subscales designed
independently subsequent to the original test construction.

Devised by Byrne (1961), this scale, made up of a combination of 5 MMPI scales - K, L, Hy, Pt and D, as well as of another subscale, the Welsh Anxiety Scale, was designed to assess the subject's position on the repression-sensitization personality dimension. The origin of this concept dates back to early work (1940's) in the area of perceptual defense, in which a study was made of the individual differences in subjects' recognition threshold in response to a tachitoscopic task involving neutral and emotionally-loaded stimuli. It was found that individuals tended to fall within a continuum with respect to their characteristic style of response to the emotionally toned stimuli, with behaviours of a predominantly avoiding, denying and repressing type at one end, and behaviours of an approaching, intellectualizing and obsessional type at the other. In the description of this apparent dichotomy, the terms "repressor" and "sensitizer" were utilized in the literature. In a study of the construct validity of the R-S scale, Orlofsky (1976) found that "sensitizers" did indeed utilize intellectualizing and isolating defenses to avoid the experience of disturbing emotions. However, individuals receiving low scores were found either to utilize repressive defenses, or to experience a low level of anxiety and defensiveness.

Since then, a number of studies have studied the repressing-sensitization dimension in a variety of response

measures such as recall of incomplete tasks in a threatening situation and responses to projective personality tests. One outcome of these studies was the identification of repression-sensitization as a meaningful and consistent personality dimension reflective of the individual's defense style in reaction to psychological stress (Byrne, 1961).

The Repression-Sensitization scale has been widely used in recent years both clinically as an index of the individual's characteristic style of coping with stress, and as a focus of continued interest in the research literature. In the latter, a search has been made for the empirical correlations of the scale with a number of discrete behaviours, ranging from verbal elaboration of experience to an affectively loaded stimulus, eye movements during REM sleep, and motor performance under stress. Sensitizers have been described in a number of studies as more attuned and influenced by social expectations than repressors (eg. Merbaum 1972, Silber and Crebstein 1964). In addition to this, there has been a continued study of the correlations of the scale with such other personality measures as the California Personality Inventory (Byrne, Golightley and Sheffield, 1965), the Incomplete Sentences Blank, and the Taylor Manifest Anxiety Scale. In a study of the

relationship between the R-S scale and the Wiggins MMPI contact scale, Carlson (1978) found that sensitizers present themselves as socially reticent, depressed, fearful, lacking in self-confidence, and experiencing conflictual family relationships. They are also seen as more hostile, distrustful, and restless. Overall, sensitizers appear as markedly more maladjusted than repressors.

Scale Administered to Teachers

The Conners Teacher Rating Scale (TRS). In his 1969 study of the effects of dextroamphetamine on hyperactivity, Conners devised a rating scale designed to be maximally sensitive to the drug effects on the target behaviours. In an attempt to collect samples of behaviours which would be most representative of the child's normal behaviour patterns, Conners' scale was to be rated by the child's teacher, who would presumably be able to base his/her ratings on a wide range of behaviours. The scale was made up of 39 items divided into the areas of classroom behaviour, group participation, and attitude towards authority. Each item was to be rated on a four-point scale, where 0 corresponds to "not at all", 1 to "just a little", 2 to "pretty much", and 3 to "very much". A subject pool of 82 boys and 21 girls, with mean age of 117.5 months, and evenly distributed for

social class, was utilized. These subjects had been previously assessed as exhibiting behaviour disorders, hyperactivity, or poor attention spans associated with learning disorders. Subjects were randomly assigned to either a drug treatment group or a matched placebo group, in a double-blind procedure. Rating scales were filled out by teachers both before and after the treatment period.

The scale items were analyzed through a principal component factor analysis, which yielded five factors:

1. Aggressive conduct disorder
2. Day-dreaming/inattentive
3. Anxious-fearful
4. Hyperactivity - reflecting restless, excitable and troublesome behaviour
5. A less well-defined "health" or "sociability" factor.

Using the change scores on the five factors, a significant difference was found to exist on all five factors between the placebo and drug group, with factors 1 to 4 decreasing after treatment and factor 5 increasing.

A number of subsequent studies have attempted to replicate the factor analysis procedure of the TRS and have consistently found a factor structure congruent with that of Connors (1969). For example, in a normative study of 570 children residing in the Pittsburg area, and using a

28-item revised version of the TRS, Goyette, Connors and Ulrich (1978) extracted three factors--conduct problem, hyperactivity, and inattentive-passive--accounting for 61.2% of the variance and bearing a high correlation with Connor's five factors.

In addition to Connor's (1969) demonstration of the TRS's effectiveness in differentiating between pre- and post-drug treatment hyperactive groups, three studies (Werry, Sprague, and Cohen, 1975; Kupietz, Bialer and Winsberg, 1972; and Sprague, Christensen and Werry, 1974) have demonstrated that the TRS can significantly differentiate between diagnostic groups: 92 normal and 82 behaviourally deviant groups in the Kupietz et al. study; 291 normal and 64 hyperactive children in the Sprague et al. study; and finally, in a related study, 291 normal and 64 hyperactive children in the Werry et al. study. Of further interest is the finding in the Sprague et al study that factors 1, 2, and 4 (hyperactivity), account for the greatest difference in scores.

These three studies have offered a further contribution to the literature on the TRS in that they have provided its first sets of norms. The Sprague et al. study, for example, drawing its sample from the Urban section of Illinois, quotes the norm for the normal population on the hyperactivity

factor of the TRS as having a mean index score (the total score on the scale divided by the number of individual items) of .40, with a standard deviation of .55. For the hyperactive population, the mean hyperactivity index score is found to be 2.17, with a standard deviation of .72.

A test-retest reliability coefficient for the TRS ranging from .70 to .90 has been reported by Connors (1973) in a follow-up study. Finally, in the previously cited 1978 study, Goyette et al. delineated a new ten-point Hyperkinesis Index made up of ten overlapping items from both the Teachers' and the Parents' questionnaires. This Hyperkinesis Index has been shown to correlate at the .94 level with the hyperactivity factor of the Teachers' Questionnaire (Werry, Sprague and Cohen, 1975). Mean scores of 15 to 18 on the Hyperkinesis Index have frequently been used as minimal cut-off points for establishing an inclusion criterion in hyperactivity studies.

The TRS is presently the most widely used instrument in the measurement of hyperactivity, both in chemotherapeutic studies and in the identification of hyperactive children for clinical studies. In the present study, the Hyperkinesis Index of the TRS will be utilized in order to differentiate between the hyperactive and non-hyperactive (asthmatic and normal control) groups. The lower cut-off inclusion value

will be that of a raw score of at least 15, the lowest cut-off value utilized in previous studies. The upper cut-off inclusion value for the two non-hyperactive groups will be that of a Hyperkinesis Index raw score of 9.0, which represents the value two standard deviations above the mean found on the Sprague et al. (1974) norms for the normal group.

Scale Administered to Children

The Peabody Picture Vocabulary Test (PPVT). This test, developed by Dunn (1959, 1975) is a non-verbal, multiple-choice test designed to provide an estimate of the verbal intelligence of children between the ages of 2½ and 8 years, through a measure of the level of knowledge of vocabulary. It consists of 150 plates, each plate containing four pictures, with the plates arranged in order of increasing difficulty. On each plate, the child is required to point to the correct picture corresponding to a given word. Reading ability is not required. There is no time limit; the test generally is completed within 10 to 15 minutes. The test manual provides tables of IQ's ranging from 55 to 145. This test has been widely used as a test of verbal intellectual ability in children in a variety of settings for both research and clinical purposes (Sattler, 1974).

The PPVT was standardized originally on a population of 4,012 Caucasian subjects, aged 2 to 18 years, residing in Nashville, Tennessee. Subsequent test-retest reliability studies (reviewed by Sattler, 1974) have found a median test-retest reliability coefficient of .73. A large group of studies have investigated the concurrent validity of the PPVT. Thirty-seven studies evaluating correlations between the PPVT and the Stanford-Binet have found a median correlation of .66. With the WISC, highest correlations have been found with the Verbal Scale (median correlation of .66), next highest with the Full Scale (median correlation of .63), and the lowest with Performance Scale (median correlation of .54) (Sattler, 1974). In a recent study of concurrent validity of the PPVT with the WISC and WISC-R, Applebaum and Tuma (1977) found that in a group of 40 normal 10-year-old children divided evenly by sex and socio-economic status, a concurrent validity coefficient ranging from .71 to .70 was obtained between the PPVT IQ and the Verbal and Full Scale IQs on the WISC, and a coefficient ranging from .74 to .83 between the PPVT and the verbal full scale IQs on the WISC-R.

In the present study, the PPVT will be utilized as a screening tool for childhood intelligence. In order to eliminate children of borderline to mentally defective

intelligence (a factor which might confound with the illness factor), children participating in this study will be required to have a Peabody intelligence measure of at least 85.

Procedure

Data for the hyperactive group were collected as part of an ongoing study of the effects of methylphenidate and parental group therapeutic treatment on hyperactivity at the C.H.E.O. (eg. Firestone, Davey, Goodman and Peters, 1978). At an initial meeting with parents, the treatment project was explained to the family. If the family expressed interest in undergoing treatment, the tests were then administered to the child and his/her parents. Families in whom the child met the inclusion criteria were included in the study.

Parents of the children in the Asthmatic control and Normal control groups were contacted by mail and requested to take part in a psychological study of familial reactions to childhood illness (see Appendix I). If they expressed agreement to participate in the study in a subsequent telephone conversation, they were then forwarded an Informed Consent Form (see Appendix II) and a Release of Information Form (see Appendix III). Upon the return of these signed forms, a copy of the Connors Teachers Rating Scale was

forwarded to the child's teacher. If the inclusion criteria were met on the Goyette et al. (1978) Hyperkinesis Factor, both parents and the child were invited to attend an interview at the Children's Hospital of Eastern Ontario. At this meeting, the Peabody Picture Vocabulary Test was administered to the child and the MMPI, Locke-Wallace Marital Adjustment Test, and Shipley Institute of Living Scale, as well as a demographic questionnaire were administered to each parent.

Ethical Considerations

Each participating family was informed of the general objectives and procedures of the study. A parental consent form as well as a release of information form for the child's school was obtained prior to each family's participation in the study. The parents were informed of their option to withdraw from the study at any time. All data obtained in this study will be kept in strict confidence. Under no condition will the identity of any of the subjects be revealed; if specific cases are referred to, this will be done through the use of numerical codes.

Measures

In order to control for the potentially confounding effects of a number of other factors, the following dependent (control) variables were introduced in the study:

1. Age--chronological age of parent;
2. Years of Education--total years of education of parent including primary, secondary, and post-secondary;
3. Yearly Family Income--income for 1980 prior to deductions;
4. Shipley IQ--level of intellectual functioning as measured by the Shipley Institute of Living Scale;
5. Shipley CQ--the Conceptualization Quotient Score as measured by the Shipley Institute of Living Scale. This serves as a measure of the parent's level of cognitive efficiency.

In addition, two independent and fourteen dependent variables were examined:

Independent Variables

1. The Child Illness Factor--refers to the presence and nature of the illness in the identified child of each parent in the study. This factor has three independent levels: (a) the hyperactive group; (b) the asthmatic control group; (c) the normal control group;
2. The Parent Factor--this variable, divided into the two components of father and mother, refers to the parental gender of the particular parent whose behaviour is being measured;

Dependent Variables

Dependent Variables 1 to 14--MMPI scales F, K, 1, 2, 3,

4, 6, 7, 8, 9, and 0 scores, the Repression-Sensitization Scale and the Total Pathology score. These scores serve as an index of the presence and nature of psychopathology in the parent as well as of his/her characteristic style of responsiveness and adaptation to psychological stress;

Dependent Variable 15 -- the score on the Byrne Repression-Sensitization scale - a further measure of the parent's psychological coping style, here in terms of the repression-sensitization personality dimension;

Dependent Variable 16 -- the Locke-Wallace Marital Adjustment Score, which serves as an estimate of the parent's perceived level of marital adjustment.

Chapter III

Results

The question of the psychological coping styles of parents of hyperactive children was examined in this study by comparing the coping behaviours of parents of nineteen hyperactive boys to those of parents of nineteen boys admitted to a paediatric hospital for treatment of an acute but benign crisis -- a normal control group -- and of parents of eighteen hyperactive boys undergoing medical treatment for asthma -- the asthmatic control group. The measures of coping which were utilized consisted of the scores obtained by parents on the F and K validity scales of the MMPI, the MMPI clinical scales 1 (hypochondriasis), 2 (depression), 3 (hysteria), 4 (psychopathic - deviate), 6 (paranoia), 7 (psychasthenia), 8 (schizophrenia), 9 (hypomania), and 0 (social intraversion - extraversion), the MMPI Repression - Sensitization and Total Pathology scales, and the Locke - Wallace Marital Adjustment Scale. Five control variables were introduced into the study: the parent's age, level of education, yearly income, I.Q., and level of cognitive efficiency.

Both control and dependent variables were analysed in two different ways. First, a three (child illness factor) by two (parent factor) completely randomized factorial design with approximately nineteen subjects per cell was utilized (analysis 1, shown on figure 1). The child illness factor has three levels -- parents of hyperactive children, parents of normal control children, and parents of asthmatic children. The parent factor has two levels -- fathers and mothers.

Independent Variable I - Child Illness Factor

<p>Hyperactive</p> <p>n= 19</p>	<p>Asthmatic Control</p> <p>n= 18</p>	<p>Normal Control</p> <p>n= 19</p>	<p>Father</p>
<p><u>Dependent variables</u></p> <p>MMPI validity scales F, K, 1, 2, 3, 4, 6, 8, 9, 10, Total Pathology score, and Repression-Sensitization score, and the Locke-Wallace Marital Adjustment score</p>			<p>Mother</p>
<p><u>Control variables</u></p> <p>Age, years of education, yearly family income, Shipley IQ, Shipley CQ of parents of the three groups of children</p>			
<p>n= 19</p>	<p>n= 18</p>	<p>n= 19</p>	

Independent Variable 2 - Parent Factor

Figure 1. Analysis 1

Secondly, in order to test stipulated hypotheses regarding differences between mothers of hyperactive, asthmatic and normal control children, a one - way design with one independent factor -- the child illness factor for mothers -- was utilized in analyses of scores obtained by mothers taken separately (analysis 2A shown on figure 2) on the variables in the study. The child illness factor for mothers has three levels -- mothers of hyperactive children, mothers of normal control children, and mothers of asthmatic children.

Similarly, in order to test hypotheses regarding differences between fathers of hyperactive, asthmatic and normal control children, a one - way completely randomized design with one independent factor -- the child illness factor for fathers -- was utilized in analyses of scores obtained by fathers taken separately (analysis 2B, shown on figure 3) on the variables in the study. The child illness factor for fathers has three levels -- fathers of hyperactive children, fathers of normal control children, and fathers of asthmatic children.

The following statistical analyses were performed:

1. In order to determine whether parents of the three groups of children differ significantly on any of the five control variables, a three (child illness factor) by two (parent factor) analysis of variance (analysis 1) was performed on each control variable. As shown on table 1, the results of these analyses indicate that there are significant differences on each of the five control variables.

With regard to the parent's age variable, there is a significant main effect for the child illness factor, $F(2,106) =$

Child Illness Factor for Mothers

Mothers of hyperactive children	Mothers of asthmatic control children	Mothers of normal control children
n= 19	n= 18	n= 18
<u>Dependent variables</u>		
MMPI scales F; K, k, 2, 3, 4, 5, 8, 9, 10, Total Pathology Score, the Repression-Sensitization score, and the Locke-Wallace Marital Adjustment score		
<u>Control variables</u>		
Age, years of education, yearly family income, Shipley IQ, and Shipley CQ of mothers of the three groups of children		

Figure 2. Analysis 2A

Child Illness Factor for Fathers

Fathers of hyperactive children	Fathers of asthmatic control children	Fathers of normal control children
n= 19	n= 18	n= 19
<u>Dependent variables</u>		
<p>The 3 MMPI validity scales, F, K, 1, 2, 3, 4, 5, 8, 9, 10, Total Pathology score, the Repression-Sensitization score, and the Locke-Wallace Marital Adjustment score</p>		
<u>Control variables</u>		
<p>Age, years of education, yearly family income, Shipley IQ, Shipley CQ of fathers of the three groups of children</p>		

Figure 3. Analysis 2B

Table I

Analysis of Variance of Mean Scores Obtained by Parents of Hyperactive, Normal Control and Asthmatic Control Children on Control Variables

Source	MS	df	F	P
Age				
Parent (P)	57.14	1	2.50	.12
Illness (I)	181.44	2	7.95	.001**
P X I	.30	2	.01	.99
Subjects within groups	22.82	106		
Years of Education				
Parent (P)	8.58	1	1.13	.29
Illness (I)	133.03	2	17.53	.000***
P X I	7.08	2	.93	.40
Subjects within groups	7.76	106		
Yearly Income				
Parent (P)	89.29	1	.01	.93
Illness (I)	14510.84	2	12.49	.000***
P X I	86.93	2	.01	.99
Subjects within groups	11616.12	106		
Shipley IQ				
Parent (P)	1221.38	1	16.25	.000***
Illness (I)	116.04	2	1.54	.22
P X I	76.06	2	1.01	.40
Subjects within groups	75.17	106		
Shipley CQ				
Parent (P)	78.89	1	.57	.45
Illness (I)	739.16	2	.35	.01**
P X I	129.49	2	.94	.39
Subjects within groups	138.04	106		

* p < .05
 ** p < .01
 *** p < .001

Table 2

Means, Standard Deviations and Post-hoc Comparisons for

Control Variables Describing Parents of the Three Groups of Children

Variable	Parents of hyperactive children		Parents of normal control children		Parents of asthmatic children		A-Posteriori contrasts
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	
Age	33.51	4.85	37.39	5.11	36.23	4.27	+ + +
Years of Education	11.66	2.84	14.39	2.63	15.90	2.79	+ + +
Yearly Income	24,914	13,068	29,342	8,624	37,567	9,629	+ + +
Shiplely IQ	105.74	11.05	115.37	7.17	115.79	7.20	+ + +
Shiplely CQ	94.14 ^a	12.61	102.63	10.80	100.73	11.67	+ + +

^a H, N and A refer to parents of hyperactive, normal control and asthmatic control children respectively
 + significant contrast at $P < .05$, using Tukey's HSD test

7.95, $p < .001$. In other words, a significant contrast exists between parents of hyperactive, normal control and asthmatic control children on the age variable.

With regard to the total years of education variable, there is a significant main effect for the child illness factor, $F(2,106) = 17.53$, $p < .001$. In other words, a significant contrast exists between parents of hyperactive, normal control and asthmatic control children on the education variable.

With regard to the gross yearly income variable, a significant main effect was noted for the child illness factor, $F(2,106) = 12.49$, $p < .001$.

With regard to the parent's I.Q. variable, a significant main effect was also noted for the child illness factor, $F(2,106) = 16.25$, $p < .001$.

Finally, a significant main effect for the child illness factor was noted on the level of cognitive efficiency variable, $F(2,106) = .35$, $p < .01$.

There were no significant main effects for the parent factor on any of the control variables. No significant interaction effects between the child illness factor and the parent factor were found on any of the five control variables.

In order to determine whether mothers taken separately differ significantly on any of the five control variables, a one-way analysis of variance with one independent factor -- the child illness factor for mothers -- (analysis 2A) was performed for each control variable.

As shown on table 3, results of these analyses indicate that there are significant differences on four of the five control variables: (a) on the age variable, $F(2,53) = 4.209$, $p < .02$;

Table 3

Analysis of Variance of Mean Scores Obtained by Mothers of Hyperactive, Normal Control, and Asthmatic Control Children on Control Variables

Source	MS	df	F	P
Age				
Mother Subjects within groups	85.20 20.83	2 53	4.09	.02*
Years of Education				
Mother Subjects within groups	39.46 6.32	2 53	6.24	.00**
Yearly Income				
Mother Subjects within groups	69750.56 11401.76	2 53	6.12	.00**
Shipley IQ				
Mother Subjects within groups	394.63 57.82	2 53	6.82	.00**
Shipley CQ				
Mother Subjects within groups	162.21 116.60	2 53	1.40	.26

* p < .05
 ** p < .01
 *** p < .001

Table 4

Means, Standard Deviations and Post-hoc Comparisons for
Control Variables Describing Mothers of the Three Groups of Children

Variable	Parents of hyperactive children		Parents of normal control children		Parents of asthmatic children		A-Posteriori contrasts
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	
Age	32.47	4.65	36.58	4.86	35.44	4.13	H-N ^a N-A H-A + ^b
Years of Education	11.95	2.30	13.95	2.50	14.78	2.73	+ +
Yearly Income	24,631	13,005	29,342	8,743	36,833	9,769	+ +
Shipley IQ	106.11	8.35	114.79	7.20	112.89	7.17	+ +
Shipley CQ	95.37	9.60	101.21	9.94	98.17	12.70	

^a H, N and A refer to parents of hyperactive, normal control and asthmatic control children respectively
^b significant contrast at $p < .05$, using Tukey's HSD test

(b) on the years of education variable, $F(2,53) = 6.24$, $p < .01$;
(c) on the yearly income variable, $F(2,53) = 6.12$, $p < .01$;
and (d) on the I.Q. variable, $F(2,53) = 6.82$, $p < .01$.

Finally, in order to determine whether fathers taken separately differ significantly on any of the five control variables, a one-way analysis of variance with one independent factor -- the child illness factor for fathers (analysis 2B) was performed for each control variable.

As shown on table 5, results of these analyses indicate that there are significant differences on each of the five control variables: (a) on the age variable, $F(2,53) = 3.89$, $p < .05$; (b) on the years of education variable, $F(2,53) = 11.37$, $p < .001$; (c) on the yearly income variable, $F(2,53) = 6.38$, $p < .01$; (d) on the I.Q. variable, $F(2,53) = 9.76$, $p < .001$; and (e) on the level of cognitive efficiency variable, $F(2,53) = 4.43$, $p < .05$.

In light of these significant analyses, the five control variables were entered simultaneously as covariates into the subsequent analyses of variance of the dependent variables in the study.

2. In view of the high degree of inter-scale commonalities on the MMPI, a factor analysis was performed on the dependent variables derived from the MMPI -- namely MMPI scales F, K, 1, 2, 3, 4, 6, 7, 8, 9, 0, the Repression - Sensitization Scale, and the Total Pathology Scale. A principal factoring procedure with iterations was utilized. The diagonals of the correlation matrix were initially replaced by squared multiple correlations. Eighteen iterations were required. A varimax rotation was utilized.

Table 5

Analysis of Variance of Mean Scores Obtained by Fathers
of Hyperactive, Normal Control and Asthmatic Control
Children on Control Variables

Source	MS	df	F	P
Age				
Father	96.54	2	3.89	.03*
Subjects within groups	24.82	53		
Years of Education				
Father	100.64	2	11.37	.0001***
Subjects within groups	8.85	53		
Yearly Income				
Father	75444.69	2	6.38	.00**
Subjects within groups	11830.75	53		
Shipley IQ				
Father	902.81	2	9.76	.000**
Subjects within groups	92.51	53		
Shipley CQ				
Father	706.44	2	4.43	.02*
Subjects within groups	159.49	53		

* p < .05
** p < .01
*** p < .001

Table 6

Means, Standard Deviations and Post-hoc Comparisons for

Control Variables Describing Fathers of the Three Groups of Children

Variable	Fathers of hyperactive children		Fathers of normal control children		Fathers of asthmatic children		A-Posteriori contrasts
	M	SD	M	SD	M	SD	
Age	33.79	5.09	38.21	5.37	36.78	4.43	H-Na +b
Years of Education	11.53	3.36	14.84	2.73	16.00	2.79	+ +
Yearly Income	24,631	13,005	29,342	8,743	36,833	9,769	+ +
Shipley IQ	105.37	11.45	116.79	7.18	117.89	6.50	+ +
Shipley CQ	92.95	15.22	104.05	11.70	102.94	10.35	+ +

⁴ a H, N and A refer to parents of hyperactive, normal control and asthmatic control children respectively
⁺ Significant contrast at $p < .05$, using Tukey's HSD test

Four orthogonal factors were generated. The eigenvalues for each factor are shown on Table 7. As shown on Table 8, each of the dependent variables introduced into the factor analysis with the exception of scales F and 2 has a significant loading on only one factor: scale K on factor 2, scale 1 on factor 1, scale 3 on factor 1, scale 4 on factor 1, scale 6 on factor 1, scale 7 on factor 3, scale 8 on factor 3, scale 9 on factor 4, scale 0 on factor 2, the Total Pathology Scale (TP) on factor 9, and Repression - Sensitization Scale (RS) on factor 2. On the basis of these scales, the make-up of the four orthogonal factors can be considered as the following: factor 1 -- scales 1, 3, 4, 6 and TP, factor 2 -- scales K, 0 and RS, factor 3 -- scales 7 and 8, factor 4 -- scale 9.

Scale F has a moderately high loading on factor 1, 2, and 4. Scale 2 has a moderately high loading on factors 1 and 2.

The decision as to which orthogonal factors scales F and 2 were to be associated with in subsequent analyses was based on theoretical grounds. Although both factor 1 and factor 2 are made up of characterological scales, they differ on an externalization/withdrawal dimension. The MMPI scales in factor 1 represent an active coping style whereby psychological conflicts are outwardly expressed through somatization, acting out of impulses and projection of feelings onto the environment. The scales which make up factor 2 represent an attempt at dealing with conflicts by internalizing, withdrawing from the environment and creating a psychological buffer zone. As well, the scales in

Table 7

Regression Weights of Dependent Variables Describing Parents of the Three
Groups of Children on Orthogonal Factors in Varimax Rotated Factor Matrix

Variable	Factor 1	Factor 2	Factor 3	Factor 4
MMPI Scale F	.40	.37	.20	.39
K	.02	-.86	.15	-.12
1	.58	-.04	.27	.03
2	.61	.45	.17	-.24
3	.71	-.14	.06	.04
4	.67	.01	.20	.35
6	.42	.20	.23	.17
7	.31	.24	.82	-.01
8	.39	.03	.76	.26
9	.12	-.09	.09	.72
0	.06	.68	.19	-.35
Total Pathology Scale	.79	.37	.25	.12
Repression - Sensitization Scale	.06	.69	.34	.01

Table 8

Eigenvalues and Percent of Variance Accounted for by Factors in Initial Factor Matrix
Obtained through Factor Analysis of Dependent Variables Describing Parents of Hyperactive,
Asthmatic and Normal Control Children

Factor	Eigenvalue	Percent of variance
1	4.49	56.2
2	1.91	23.9
3	0.83	10.4
4	0.76	9.5

factor 2 are associated with subjective psychological distress, unlike the scales in factor 1 which shield the individual from the experience of emotional pain. MMPI scale 2 is more congruent with factor 2 than factor 1 from a coping perspective, as it reflects an internalizing, withdrawing coping style. Furthermore it is strongly associated with low self-esteem and a lowered mood which are congruent with the psychological distress characteristics of factor 2.

Factor 4, made up of scale 9, represents a coping style characterized by over-investment of physical and psychic energy into external activities. Scale F, which has a moderately high loading on factors 1, 2 and 4, is also associated with an over-expenditure of psychic energy which may either be internalized in a schizoid stance, or expended in physical activities. Both scales F and 9 are associated with psychotic states when elevated, in contrast with scales 1 and 3 in factor 1 and scales 0 and RS in factor 2 which are typically associated with neurotic personality organizations. On these grounds, scale F was included in factor 4 for the purpose of subsequent analyses.

With the addition of these two variables, the four orthogonal factors were as follows: factor 1 -- MMPI scales 1, 3, 4, 6, and the Total Pathology Scale, factor 2 -- MMPI scales K, 2, 0 and the Repression - Sensitization Scale, factor 3 -- MMPI scales 7 and 8, factor 4 -- MMPI scales F and 9.

3. The subscales for each orthogonal factor were then analyzed together in a separate multivariate analysis of covariance. In other words, one multivariate analysis of covariance was performed for factor 1, with the individual scores obtained

by parents of the three groups of children on MMPI scales 1, 3, 4, 6 and TP subsumed as the dependent variables for factor 1. A separate multivariate analysis of covariance was performed for each of factors 2, 3 and 4 respectively:

Results of these analyses (shown on tables 9 to 17) are the following:

a) Factor 1 MMPI Scales 1, 3, 4, 6 and TP

Results of a three (child illness factor) by two (parent-factor) multivariate analysis of covariance with five control variables as covariates, (as shown on Table 9) indicate that there is a significant main effect for the child illness factor, $F(2,101) = 3.61, p < .000$.

Results of a univariate analysis of covariance with one independent factor -- the child illness factor, and five control variables, on significant subscales of factor 1 (as shown on Table 10) indicate that there is a significant main effect with respect to scale 4, $F(2,101) = 10.60, p < .000$; scale 6, $F(2,101) = 3.60, p < .03$; and the Total Pathology scale, $F(2,101) = 7.28, p < .001$.

Results of a one - way multivariate analysis of covariance with one independent factor -- the child illness factor for mothers, of scores obtained by mothers of the three groups of children, indicate that there is a significant main effect, $F(2,48) = 2.21, p < .02$. Results of univariate analyses of covariance on significant subscales (as shown on Table 14) point to the presence of a significant effect with respect to scale 3, $F(2,48) = 5.07, p < .01$; scale 4, $F(2,48) = 6.50, p < .01$; scale 6, $F(2,48) = 3.47, p < .04$, and the Total

Table 9
Multivariate Analyses of Covariance of Mean Scores Obtained by Parents
of the Three Groups of Children on Subscales of Dependent Variable Factors

Source	Hotellings	F	df	p
Factor 1 -- MMPI Scales 1, 3, 4, 6, and Total Pathology				
Illness (I)	.38	3.61	2,101	.000***
Parent (P)	.07	1.31	1,101	.27
I x P	.07	.65	2,101	.77
Mother	.51	2.21	2,48	.02*
Father	.41	1.76	2,48	.08
Factor 2 -- MMPI scales K, 2, 0 and Repression - Sensitization				
Illness (I)	.26	3.15	2,101	.01*
Parent (P)	.21	5.10	1,101	.001**
I x P	.08	1.00	2,101	.44
Mother	.47	2.61	2,48	.01*
Father	.19	1.06	2,48	.40
Factor 3 -- MMPI scales 7 and 8				
Illness (I)	.09	2.27	2,101	.06
Parent (P)	.01	.28	1,101	.75
I x P	.09	2.27	2,101	.06
Mother	.10	1.17	2,48	.33
Father	.22	2.55	2,48	.04*
Factor 4 -- MMPI scales F and 9				
Illness (I)	.08	2.02	2,101	.09
Parent (P)	.09	4.66	1,101	.01*
I x P	.08	1.90	2,101	.11
Mother	.06	.67	2,48	.61
Father	.18	2.06	2,48	.09

* p < .05
 ** p < .01
 *** p < .001

Table 10

Univariate Analyses of Covariance of Mean Scores Obtained by Parents of
Hyperactive, Normal Control and Asthmatic Control
Children on Subscales of Dependent Variable Factors

Dependent Variable	MSE	df	F	P
Factor 1				
Scale 1	65.73	2,101	.18	.83
3	53.61	2,101	2.73	.07
4	84.99	2,101	10.60	.000***
6	59.80	2,101	3.60	.03*
TP	10.07	2,101	7.28	.001***
Factor 2				
Scale K				
2	60.87	2,101	1.09	.34
0	112.84	2,101	1.95	.15
RS	74.71	2,101	3.44	.04*
	169.08	2,101	.77	.46
Factor 3				
Scale 7				
8	81.75	2,101	.76	.47
	84.22	2,101	1.67	.19
Factor 4				
Scale F				
9	48.23	2,101	3.82	.02*a
	102.74	2,101	.06	.93
Locke-Wallace Score				
	2486.96	2,101	4.58	.01*

* p < .05
 ** p < .01
 *** p < .001
 a This trend cannot be considered significant as the overall multivariate analysis of covariance for Factor 4 is not significant.

Table II

Mean Scores Adjusted for Covariates and Post-hoc Comparisons for Dependent Variables Describing Parents of Hyperactive, Asthmatic and Normal Control Children

Variable	Parents of hyperactive children	Parents of normal control children	Parents of asthmatic children	A-Posteriori contrasts		
				H-N ^a	N-A	H-A
Scale F	54.08	52.49	57.22			
K	54.29	55.56	52.70			
1	51.49	52.26	52.73			
2	59.92	54.21	55.28			
3	58.37	53.70	55.85			
4	58.67	47.85	55.59	+		+
6	57.26	52.47	56.84		+	+
7	55.16	52.06	53.08			
8	51.46	49.55	53.73			
9	53.06	51.75	52.11			
0	51.09	51.20	57.04			+
TP	10.96	8.76	11.64		+	+
RS	50.81	55.23	53.23			
Locke-Wallace Score	109.61	121.36	108.15			+

^a H, N and A refer to parents of hyperactive, normal control, and asthmatic control children respectively
 + significant contrast at $P < .05$, using Tukey's HSD test

Table 12

Univariate Analyses of Covariance of Mean Scores Obtained by Mothers Pooled Together and Fathers Pooled Together on Subscales of Dependent Variable Factors

Dependent Variable	Mse	df	F	P
Factor 1				
Scale 1	65.73	1,101	1.10	.34
3	53.61	1,101	2.68	.07
4	84.99	1,101	1.05	.35
6	59.80	1,101	.53	.59
TP	10.07	1,101	.76	.47
Factor 2				
Scale K	60.87	1,101	1.09	.54
2	112.84	1,101	1.95	.44
0	74.71	1,101	3.44	.01**
RS	169.08	1,101	.77	.10
Factor 3				
Scale 7	81.75	1,101	.01	.91
8	84.22	1,101	.32	.57
Factor 4				
Scale F	48.23	1,101	4.06	.05*
9	102.74	1,101	7.66	.01**
Locke-Wallace Score				
	33.61	1,101	.06	.80

* p < .05
 ** p < .01
 *** p < .001

Table I3

Mean Scores Adjusted for Covariates for Dependent Variables Describing Mothers, Pooled Together and Fathers Pooled Together of the Three Groups of Children

Variable	Mothers pooled together	Fathers pooled together
Scale F	55.86	53.22
K	53.75	54.67
1	51.23	53.07
2	55.71	57.27
3	56.04	56.36
4	53.75	54.27
6	56.17	54.83
7	53.34	53.54
8	51.07	52.01
9	49.64	54.98
0	55.99	50.77
TP	10.02	10.84
RS	55.20	50.98
Locke-Wallace Score	110.62	111.74

Table 14

Univariate Analyses of Covariance of Mean Scores Obtained by Mothers
of Hyperactive, Normal Control and Asthmatic Control
Children on Subscales of Dependent Variable Factors

Dependent Variable	Mse	df	F	p
Factor I				
Scale 1	82.99	2,48	.45	.64
3	59.85	2,48	5.07	.01**
4	97.17	2,48	6.50	.01**
6	59.87	2,48	3.47	.04*
TP	9.47	2,48	5.49	.01**
Factor 2				
Scale K	58.11	2,48	1.12	.33
2	81.01	2,48	3.87	.03*
0	75.91	2,48	3.65	.03*
RS	151.93	2,48	.16	.86
Factor 3				
Scale 7	79.22	2,48	2.02	.14
8	82.81	2,48	.69	.51
Factor 4				
Scale F	36.51	2,48	.68	.51
9	107.75	2,48	.88	.42
Locke-Wallace Score				
	1652.16	2,48	.06	.80

* p < .05
 ** p < .01
 *** p < .001

Table 15

Means Scores Adjusted for Covariates and Post-hoc Comparisons for Dependent

Variables Describing Mothers of Hyperactive, Asthmatic Control and Normal Control Children

Variable	Mothers of hyperactive children	Mothers of normal control children	Mothers of asthmatic control children	A-Posteriori H-N	N-A	H-A
Scale F	54.20	52.11	54.39			
K	53.45	55.39	51.34			
1	52.54	53.34	52.40			
2	60.58	51.04	55.97	+		
3	60.62	51.25	56.14	+		
4	60.72	47.13	54.04	+		
6	59.61	52.19	57.27			+
7	57.26	56.59	52.79			
8	53.40	49.31	51.47			
9	53.09	47.96	51.06			
0	52.71	54.78	61.27			+
TP	11.36	7.99	11.03	+		+
RS	54.59	55.87	57.28			
Locke-Wallace Score	113.77	121.45	101.94			

a H, N and A refer to parents of hyperactive, normal control and asthmatic control children respectively

+ significant contrast $p < .05$, using Tukey's HSD test

Table 16

Univariate Analyses of Covariance of Mean Scores Obtained by Fathers of Hyperactive, Normal Control and Asthmatic Control Children on Subscales of Dependent Variable Factors

Dependent Variable	Mse	df	F	p
Factor I				
Scale 1	48.31	2,48	.84	.43
3	49.43	2,48	.18	.83
4	80.01	2,48	4.92	.01**a
6	62.17	2,48	.88	.42
TP	11.52	2,48	2.80	.07
Factor 2				
Scale K	67.41	2,48	.32	.72
2	128.19	2,48	.56	.58
0	76.78	2,48	.64	.53
RS	172.73	2,48	.68	.51
Factor 3				
Scale 7	86.94	2,48	.01	.99
8	90.36	2,48	2.62	.08
Factor 4				
Scale F	62.41	2,48	3.76	.03*a
9	105.74	2,48	.44	.65
Locke-Wallace Score				
	1035.04	2,48	1.96	.15

* p < .05
 ** p < .01
 *** p < .001

a This trend cannot be considered significant as the overall multivariate analysis of covariance for the factor is not significant.

Table 17

Mean Scores Adjusted for Covariates and Post-hoc Comparisons, for Dependent Variables Describing Fathers of Hyperactive, Normal Control and Asthmatic Control Children

72

Variable	Fathers of hyperactive children	Fathers of normal control children	Fathers of asthmatic control children	A-Posteriori H-N N-A H-A
Scale F	53.51	53.05	60.31	
K	54.76	61.22	53.96	
1	50.70	54.26	53.43	
2	59.91	56.44	54.92	
3	56.06	55.85	56.77	not overall significant
4	56.17	48.72	57.90	
6	54.24	52.93	56.61	
7	53.14	53.31	53.71	
8	48.92	50.03	56.77	
9	52.32	56.02	55.41	
0	50.14	49.13	52.60	
TP	10.45	9.53	12.35	
RS	47.94	53.40	49.49	
Locke-Wallace Score	113.22	119.62	103.60	

^a H, N, and A refer to parents of hyperactive, normal control, and asthmatic control children respectively
⁺ significant contrast at $p < .05$, using Tukey's HSD test.

Pathology scale, $F(2,48) = 5.49, p < .01$.

A one - way multivariate analysis of covariance with one independent factor -- the child illness factor for fathers, of scores obtained by fathers of the three groups of children, did not produce significant results.

b) Factor 2 MMPI scales K, 2, 0 and RS

Results of a three (child illness factor) by two (parent factor) multivariate analysis of covariance indicate that there is a significant main effect for the child illness factor, $F(2,101) = 3.15, p < .01$, and for the parent factor, $F(1,101) = 1.31, p < .27$.

Results of univariate analyses of covariance on significant subscales with respect to the child illness factor indicate that there is a significant effect with respect to scale 0, $F(2,101) = 3.44, p < .04$. With respect to the parent factor, results of univariate analyses of covariance point to a significant effect with respect to scale 0, $F(2,48) = 2.61, p < .02$.

Results of a one - way multivariate analysis of covariance, child illness factor for mothers, point to the presence of a significant main effect, $F(2,118) = 2.21, p < .02$. Results of univariate analyses of covariance on significant subscales indicate that there is a significant effect with respect to scale 2, $F(2,48) = 3.87, p < .03$, and scale 0, $F(2,48) = 3.65, p < .03$.

No significant results were obtained on a one - way multivariate analysis of covariance with one independent factor, the child illness factor for fathers.

c) Factor 3 MMPI scales 7 and 8

No significant results were obtained on a three (child illness factor) by two (parent factor) multivariate analysis of covariance, nor on a one - way multivariate analysis of covariance with respect to the child illness factor for mothers.

Results of a one - way multivariate analysis of covariance, child illness factor for fathers, indicates that there is a significant effect for this factor, $F(2,48) = 2.55, p < .04$. However no significant effect was found on the subscales within this factor.

d) Factor 4 MMPI scales F and 9

Results of a three (child illness factor) by two (parent factor) multivariate analysis of covariance indicate that there is a significant effect for the parent factor, $F(2,48) = 4.66, p < .01$. Results of univariate analyses of covariance on significant subscales indicate that there is a significant effect with regards to both scale F, $F(1,101) = 4.06, p < .05$, and scale 9, $F(1,101) = 7.66, p < .01$.

No significant effects were obtained through one - way multivariate analyses of covariance with respect to either the child illness factor for mothers or the child illness factor for fathers.

4. The Locke-Wallace Marital Adjustment Score, the only dependent variable in the study not stemming from the MMPI, was examined separately through univariate analyses of covariance. Results of a three (child illness factor) by two (parent factor) univariate analysis of covariance (see Table 10) yielded a significant main effect for the child illness factor, F

(2,101) = 4.58, $p < .01$.

One - way univariate analyses of covariance with either the child illness factor formothers or the child illness factor for fathers were not significant.

Chapter IV

Discussion

The results of the analyses of the dependent variables provide substantial support for the hypotheses put forth in this study as they pertain to the mother's -- rather than both parents' -- response to the hyperactive child. The prediction of a relatively greater impairment of psychological functioning in mothers of hyperactive children was found with respect to self-esteem, satisfaction with present life adjustment, and overall level of psychological defensiveness necessary for coping. Of the various psychological defenses which were hypothesized to be more prominent in parents of hyperactive children, those which were found to be significant occurred largely within the mothers rather than the fathers of this group. These defenses, comprising the overall psychological coping styles of mothers of hyperactive children, included the prominent use of denial and repression of psychological conflicts, the experience of feelings of anger and bitterness and the tendency to blame external circumstances for their problems. The hypothesis of a higher level of generalized anxiety in parents of hyperactive children, partly handled through the use of obsessive - compulsive mechanisms and over - reaction to minor concerns, was not confirmed. Also not confirmed was the tendency to express conflictual feelings through somatic symptoms, and the increased defensiveness towards self - disclosure which had been hypothesized in the hyperactive group. The overall pattern of psychological adjustment of fathers of hyperactive children did not differ significantly from that of fathers of the other groups.

Additional findings of relevance to the parents of asthmatic children were obtained. These individuals were found to experience a number of difficulties of a particular nature including a degree

of anxiety in social situations, and a dissatisfaction with marital adjustment. These results and their implications for the understanding of the coping styles of parents of hyperactive children will be discussed in this section with reference to each hypothesis put forth in Chapter II. This will be preceded by a discussion of the results obtained with respect to the control variables as descriptors of parents of hyperactive children on a number of relevant parameters.

Analysis of Control Variables

Results of analyses of variance of the control variables, presented in the previous section, indicated that a significant difference exists for each of the five control variables with respect to the child illness factor (Analysis 1). Although no significant differences were found between fathers and mothers pooled together (Analysis 1, parent factor), a significant difference between the three illness groups was found for each variable when mothers and fathers were examined separately.

A-posteriori tests of differences between group means yielded the following results:

1. Age

Pooling both fathers and mothers together (Analysis 1, child illness factor), parents of hyperactive children (mean age 33.5) were found to be significantly younger than both parents of normal control children (mean age 37.4) and parents of asthmatic children (mean age 36.2). Examining each parent separately (Analysis 2), mothers of hyperactive children were found to be significantly younger than mothers of normal control children. A similar trend was found for fathers.

A number of other studies have reported that parents of children undergoing psychological treatment in a clinical setting are overall chronologically younger than parents of normal control children (eg. Miller and Klein, 1978, in parents of emotionally disturbed children; Alberts and Firestone, 1982, in natural parents of hyperactive children versus parents of both adopted hyperactive children and normal control children.)

The findings in this study with respect to the age variable may be linked in a number of ways to the difference in recruitment of the three illness groups, the normal and asthmatic control groups being drawn from hospital files and requested to participate in the study, in contrast to the hyperactive group which was already in active treatment in the Psychology Department. One could speculate that in a population of individuals contacted by mail regarding their interest in participating in a study, greater interest may be shown by somewhat older individuals. Another possible explanation is that within the population of parents of hyperactive children, younger parents are more likely to seek help from a hospital rather than a private setting.

Another alternate explanation may relate to the finding in this study that both mothers of normal control children and mothers of asthmatic children have a higher educational level than mothers of hyperactive children (described below). The added years of post - secondary education may act to postpone child-bearing such that mothers of asthmatic children and normal control children would be somewhat older than mothers of similarly aged hyperactive children.

2. Total Years of Education

Pooling fathers and mothers together (Analysis 1, child illness factor) both parents of normal control children and parents of asthmatic children have a significantly higher total of years of education (mean of 14.4 years for parents of normal control children and 15.9 years for parents of asthmatic children) than parents of hyperactive children (mean of 11.7 years). A similar trend is found when examining mothers and fathers separately (Analysis 2A and 2B). This pattern, also observed by Miller and Klein (1978) and Alberts and Firestone (1982), might as well be explained on the basis of the differential recruitment process of the hyperactive group and the asthmatic and normal control groups, with the further assumption that the more highly educated portions of the control group populations contacted would be likely to express interest in voluntary participation in a study not closely associated with a treatment program.

3. Gross Family Income for 1980

Pooling fathers and mothers together, parents of asthmatic children have an overall higher gross family income for 1980 (mean of \$37,600) than parents of hyperactive children (mean of \$25,000). A similar trend was found within both mothers and fathers taken separately (Analysis 2A and 2B). This finding is likely closely related to the difference in educational levels between these two groups.

Parents of asthmatic children also have a significantly higher yearly income than parents of normal control children (mean \$29,300). This figure is quite close to the average family income in Ontario of \$28,086 in 1980 (Statistics Canada

1980) and in the metropolitan Ottawa area of \$28,290 in 1979 (Statistics Canada 1979). The finding of a significantly higher income in parents of asthmatic children versus parents of normal control children is somewhat surprising since the overall difference in educational level between these two groups is not statistically significant. It may be that this difference, in the order of 1.5 years, may reflect a relatively greater frequency of parents having undergone post - graduate study in the asthmatic group, allowing access to higher paying jobs. An alternate explanation is that the parents of asthmatic children are more highly motivated to achieve material success than the parents of normal control children.

4. Shipley-Hartford I.Q. Estimate

Pooling fathers and mothers together, the overall level of intellectual ability, estimated by the Shipley Institute of Living Scale, is significantly higher in both parents of normal control children (mean IQ of 115.4, falling in the bright normal range of intelligence), and parents of asthmatic children (mean IQ of 115.8, also in the bright - normal range) than in parents of hyperactive children (mean IQ of 105.7, average range of intelligence). A similar trend was found in mothers and fathers examined separately.

These results are likely highly correlated with educational level, and thus related to similar factors.

5. Shipley-Hartford Estimate of Cognitive Efficiency

Pooling fathers and mothers together, parents of hyperactive children have an overall lower level of cognitive efficiency, as measured by the Shipley Conceptualization Quotient (mean value of 94.1) than parents of normal control children (mean value of

102.6) This trend is noted only in fathers when parents are taken separately. These results indicate that within a normal range of functioning, relative to the normal control children, parents of hyperactive children have a somewhat lower ability to efficiently utilize their intellectual potential than parents of normal control children. This suggests that a process of mild interference with optimal cognitive functioning may exist in parents of the hyperactive children.

Analysis of Dependent Variables

Hypothesis 1

"Parents of hyperactive children utilize a higher intensity of "neurotic" defenses than the parents of the normal control group. Their level of defensiveness is also higher than that of the asthmatic group, in view of the additional behavioural component which the parent of the hyperactive child must adapt to.

More specifically, parents of hyperactive children utilize a higher level of repression and denial of their feelings and problems (reflected by MMPI scale 3). They will tend to express their psychological conflicts through physical symptoms (scale 1). They will adopt perfectionistic and obsessive - compulsive mechanisms in response to feelings of guilt, anxiety and self - doubt (scale 7), show a tendency to over-react to minor concerns, and handle painful emotions by attempting to understand them in intellectual terms (RS scale). Thus MMPI scales 1, 3, 7 and the RS scale will be significantly more elevated in the profiles of the hyperactive group than in the other groups."

This was confirmed with respect to scale 3, within mothers only. Mothers of hyperactive children obtained a significantly

higher score (mean of 60.6) than mothers of normal control children (mean of 51.3). Mothers of asthmatic children obtained a mean score of 56.1, falling about halfway between these two groups, with a difference which is not statistically significant.

These results indicate that mothers of hyperactive children utilize the mechanisms of denial and repression in response to psychological stress to a degree more marked than the mothers of normal control children. The response level of the latter falls close to the statistical mean for this scale. Mothers of hyperactive children are also more likely to have unmet needs for dependency on others than mothers of normal control children, and to seek fulfillment of these needs by presenting themselves as socially visible and outgoing. Their relationships may be somewhat superficial and manipulative in their help-seeking behaviours. They may also somatize their conflicts; this defense is likely to be less prominent than the other coping behaviours since scale 1 is not significantly elevated above the mean. The psychological flavour implied for this group of mothers is of individuals who are experiencing psychological conflicts of some significance, relating partially to their unmet needs for emotional dependency, and who attempt to resolve these conflicts both by repressing and/or denying their intensity and through engaging in a number of interpersonal interactional patterns aimed at receiving attention and support from others.

This coping style is adopted in favour of the hypervigilant, intellectualizing and obsessional approach towards dealing with

feelings of guilt and anxiety implied by scales 7 and RS, or of the expression of inner conflict through bodily symptoms as a primary defense implied by scale 1. These scales have been differentiated in terms of the underlying cluster of emotions resulting in the acquisition of each particular defensive mode. Scale 1 is associated with a history of traumatic shock or prolonged childhood illness with secondary gain, resulting in a fear of death or loss of bodily function, and scale 7 can be described as a hyper-alertness to criticism and hostility from others, related to a history of sibling and peer conflicts. In contrast, scale 3 reflects the presence of strong underlying emotional pain, linked to the experience of rejection, such as loss of a loved one or of an important developmental phase. The adoption of a scale 3 orientation in the mothers of hyperactive children rather than of the coping styles characterized by scales 1, 7 or RS would suggest that of the various developmental factors described above, a significant loss comprises a major fact in the psychological make-up of this group. (The importance of the theme of loss is also underlined by the significant elevation obtained by this group on scale 2 discussed below). The lack of a parallel significant difference between mothers of asthmatic children and the normal control group on scale 3 suggests that the repercussions of mothering a hyperactive child may contribute significantly to the phenomenon of loss experienced by the mothers of hyperactive children. The lack of significant elevation on the other scales of "neurotic defensiveness" in mothers of asthmatic children relative to the normal control group lends support to the hypothesis put forth in this study of a greater psychological

impairment in the hyperactive group with respect to mothers. Finally, the relative elevation of psychological defensiveness in mothers and not fathers of hyperactive children relative to each respective control group, lends support to the hypothesis presented in the literature of a greater psychological trauma for the mother rather than the father of a chronically ill child.

Hypothesis 2

"Parents of the hyperactive group will experience a significantly greater impairment of self-esteem and report a higher level of depressive symptoms than the other groups. Thus, scale 2 will be significantly higher in the hyperactive group."

This hypothesis was confirmed only with respect to mothers of hyperactive children, who obtained a significantly higher score on scale 2 (mean of 60.6) than mothers of normal control children (mean of 51.0). Again, mothers of asthmatic children obtained a score ranging inbetween these two groups (mean of 56.0) which was not significantly different from either group.

These results indicate that mothers of hyperactive children present symptoms of a mild level of depression, in contrast with mothers of normal control children whose scores fall just above the mean for this scale. Mothers of hyperactive children cope with psychological stress by turning inwards their feelings of anger and frustration. The implication is one of an experience of loss of a highly valued object, either concrete or conceptual, in this group of mothers. This loss has not been inwardly resolved, and these mothers cope with the ensuing

psychological conflicts by turning inwards their feelings of anger and frustration towards the loss. This results in an erosion of self-esteem, a sense of failure and a perception of self as not lovable. Although the elevation on this scale of one standard deviation above the mean does not lead to a severe impairment in functioning, it does reflect a decrease in motivation and energy level in this group of mothers as well as a moderate lowering of overall efficiency.

This finding lends additional support to the hypothesis of the mother as the parent who is more profoundly affected psychologically by the chronically ill child (stated in Hypothesis 5 specifically with respect to impairment of self - esteem), as well as to the hypothesis of a relatively greater psychological impairment in the hyperactive than the asthmatic group.

Hypothesis 3

"Parents of the hyperactive group will exhibit a greater level of frustration and dissatisfaction with their present life circumstances which is experienced directly through feelings of anger and bitterness (scale 4), or handled by a tendency to blame others for their problems and feel morally self - righteous (scale 6). Thus scales 4 and 6 will be significantly higher in the hyperactive group than in the other two groups."

This hypothesis was partly confirmed: Parents of hyperactive children obtained significantly higher scores than parents of normal control children on both scales 4 (means of 58.7 and

47.8 respectively) and scale 6 (means of 57.3 and 52.5 respectively). However, parents of asthmatic children also obtained a significantly higher score than parents of normal control children on both scales (mean of 55.6 for scale 4 and 56.8 for scale 6).

On scale 4, although a similar pattern was suggested for fathers examined separately (Analysis 2B), this result cannot be accepted as significant since the overall multivariate analysis of covariance for factor 1 is not significant for the child illness factor for fathers. For mothers taken separately (Analysis 2A), only mothers of hyperactive children obtained a significantly higher score than mothers of normal control children.

On scale 6, a significant difference was obtained for mothers taken separately, with only mothers of hyperactive children obtaining a significantly higher score than mothers of normal control children. No significant differences were found within fathers taken separately.

The results obtained for scale 4 indicate that parents of both hyperactive and asthmatic children are somewhat dissatisfied with their life adjustment, experiencing a degree of felt anger and frustration, in contrast with the parents of normal control children whose average score on this scale falls below the scale's statistical mean. Parents of hyperactive and asthmatic children cope with psychological stress with an increased striving

for mastery over their situation which may be partly unsuccessful. They may also express their impulses in a somewhat less modulated way than parents of normal control children. This may be reflected in somewhat shallow interpersonal relationships, a degree of social non-conformity, and a mild abuse of addictive substances. The latter may be particularly prominent in mothers of hyperactive children who are overall mildly depressed. This group may also experience more significant difficulties in handling feelings of anger in view of their concurrent drive towards repression and denial of their feelings (scale 3 elevation). They may cope with these conflictual thrusts by expressing their feelings of anger indirectly, an approach which can be self and interpersonally damaging.

Since both hyperactive as well as asthmatic groups show an elevation on scale 4 with respect to the normal control group, the scale 4 elevation in the hyperactive groups cannot be interpreted here as a reflection of a higher constitutional predisposition towards behavioural impulsivity in parents of hyperactive children. This elevation is better interpreted as reflective of a psychological coping style characterized by a partial disinhibition and expression of impulses in response to stress and an unsuccessful attempt at mastery.

The results obtained for scale 6 indicate that relative to parents of normal control children, both parents of hyperactive and asthmatic children are somewhat more rigid, sensitive

to the opinions of others and feel somewhat more limited and pressed by the social or vocational aspect of their lives. They respond to their difficulties by tending to blame their problems on outside circumstances, at times "projecting" their anger onto others.

When parents are examined separately, the only significant difference noted is between mothers of hyperactive children (mean of 59.6) and mothers of normal control children (mean of 52.2). This lends further support to the hypothesis of a more pronounced psychological trauma in the mothers of hyperactive children, expressed here by a general psychological "thinskin-ness". This may reflect the influence on personality make-up of the ongoing stresses and psychological wear-and-tear which mothers of hyperactive children are faced with.

Hypothesis 4:

"Parents of the hyperactive group will more frequently acknowledge a dissatisfaction with their overall adjustment, an inability to cope successfully with their problems, and a fear of loss of control over their lives (scale F). They will less frequently describe feelings of self-acceptance, mastery and control over their situation (low scale K). Their personality profiles will objectively reflect an overall lower level of adjustment (Total pathology score). Thus scales F and TP will be significantly higher, and scale K significantly lower in the hyperactive than the other two groups."

This was confirmed in part with respect to the Total pathology score, on which both parents of hyperactive children (mean of 11.0) and parents of asthmatic children (mean 11.6) obtained significantly higher scores than parents of normal control children (mean of 8.8). A similar pattern was obtained within mothers (Analysis 2A). No significant differences occurred within fathers.

These results indicate that parents, and more particularly mothers, of both hyperactive and asthmatic children experience a greater level of psychological distress than parents of normal control children.

Results of the other scale comparisons have shown that parents of hyperactive and asthmatic children have a characteristic and distinct way of coping with psychological stress. (Again, these trends have been noted primarily in mothers, and thus, discussion of differences between parents of the three groups of children pertain in the main to mothers rather than to both parents.) Results obtained here reveal an important similarity between the hyperactive and asthmatic groups, in terms of an overall, quantitative measure of the total extent or intensity of psychological defensiveness. This suggests that the factor of parenting a chronically ill child produces a significant psychological stressor for the parents, which results in a moderate activation of psychological coping mechanisms.

No significant differences were obtained with respect to scale K. The mean values for each illness group for this scale (54.3 for parents of hyperactive children, 55.6 for parents of normal control children and 52.7 for parents of asthmatic children) fall within the range typically obtained by normal

as well as many psychiatric patients. Thus parents in all three groups answered the MMPI questions with an overall attitude reflecting a "normal" balance between openly disclosing areas of difficulty and projecting a positive self-image of good adjustment.

The lack of significant differences between the three groups may be accounted for by the fact that although parents of hyperactive, asthmatic and normal control children utilize different coping behaviours, their attitude towards self-disclosure on the MMPI--or test-taking defensiveness--did not significantly differ.

The hypotheses with respect to scale F were not confirmed. Although the multivariate analysis of covariance for factor 4 (made up of MMPI scales F and 9) was not overall significant for fathers (Analysis 2B), results of a univariate analysis of covariance (child-illness factor for fathers) show tentative evidence for the presence of a trend different from the above-predicted one, whereby scores obtained by fathers of asthmatic children (mean of 60.3) tend to be overall higher than scores obtained by fathers of hyperactive children (mean of 53.5) and fathers of normal control children (mean of 53.0) on this scale. This would tentatively suggest that fathers of asthmatic children, who obtain a mean F score significantly above the mean for this scale, acknowledge a somewhat higher occurrence of unusual or disturbed symptomatology than fathers in the other groups, and they may tend to be somewhat more unconventional, moody and changeable than fathers of the other groups of children, as well as experiencing some difficulties in dealing with situational stresses.

Hypothesis 5:

"Mothers of the hyperactive group will experience a more pronounced decrease in self-esteem and a greater level of psychological distress than both fathers of the hyperactive group and all other parents. Thus, scales 2, 7, K and RS will be significantly higher in mothers of hyperactive children than in fathers of hyperactive children (and in parents of the other groups as hypothesized above)."

This hypothesis was confirmed in part with respect to scale 2 (see pages 84-85). It was not confirmed with respect to scales 7, K and RS. Possible explanations for this have been offered above (see pages 82-84).

Additional findings

A number of additional trends which had not been hypothesized were found with respect to several dependent variables in this study.

1. Locke-Wallace Marital Adjustment Score

Parents of normal control children with fathers and mothers pooled together (Analysis 1; child illness factor) obtained a significantly higher Locke-Wallace Marital Adjustment Score (mean value of 121.4) than parents of asthmatic children (mean of 103.1). Parents of hyperactive children obtained a mean score of 109.6, which was not found to be significantly different from the other groups.

These results indicate that parents of asthmatic children are overall less satisfied with their marriage than parents of normal control children. Their score on this scale, falling slightly above the cut-off for dysfunctional couples, suggests

the presence of marital problems of a mild to moderate degree of severity in the parents of asthmatic children.

2. Scale 0 (Social introversion/extraversion)

Parents of asthmatic children were found to have a significantly higher score on this scale (mean of 57.0) than both parents of normal control children (mean of 51.2) and parents of hyperactive children (mean of 51.1). Mothers pooled together (Analysis 1, parent factor) obtained a significantly higher score (mean of 56.0) than fathers pooled together (mean of 50.8). When mothers were examined separately (Analysis 2A), mothers of asthmatic children obtained a significantly higher score (mean of 61.3) on this scale than mothers of hyperactive children (mean of 52.8).

These results indicate that relative to both parents of normal control children and parents of hyperactive children, parents of asthmatic children, particularly mothers, whose score on this scale is above one standard deviation higher than the scale mean experience a degree of discomfort in interpersonal relations and tend to shy away from social situations. They show some traits of self-depreciation, sensitivity, and lack of self-confidence.

The factor of social discomfort may contribute to the lower level of marital satisfaction found in the asthmatic group. The difficulties in relating to others, which is found to be particularly marked in the mothers, suggest that parents

of asthmatic children have a relative paucity of the personality resources necessary to develop and maintain healthy and fulfilling interpersonal relationships.

One can speculate on the relationship between these difficulties and the variable of parenting an asthmatic child. It might be expected that parents who have trouble communicating with each other and the child, and who would outwardly manifest symptoms of marital dissatisfaction, may adversely effect the child's emotional and social development. This would be congruent with the school of thought which views the etiology of the asthmatic syndrome as stemming in part from a dysfunctional parent-child relationship.

Alternately, one may view the relatively lower level of marital satisfaction in these parents partly as a consequence of the additional psychological stresses of raising a chronically ill child for individuals who, by virtue of their personality make-up, would already be predisposed to experience some difficulties in performing the parenting role.

Conclusion

Complex parenting skills are needed to cope with the ongoing challenge of raising a child. Chronic illness in a child places added demands on the parent which require further adaptation. The parent of the hyperactive child is faced with a particularly difficult problem of adaptation in raising a child who suffers chronic impairment in both social and academic functioning and manifests a disruptively high level of motor activity.

Clinicians who work with families of hyperactive children are familiar with the parents' complaints around problems of adjustment. This study provides an initial empirical investigation of the manner in which parents of hyperactive children cope with their children's illness. With the use of actuarial psychometric instruments, the psychological coping styles of parents of hyperactive children have been compared with those of parents of asthmatic children and parents of a group of normal control children.

The parents of the hyperactive children in this study are significantly younger than the parents of the asthmatic and normal control children in the study. Their socioeconomic status is significantly lower, both in terms of lower total years of education and a lower family income. Their overall level of intellectual functioning is of a significantly lower order than that of parents of the other two groups of children. Fathers of hyperactive children manifest a significantly lower level of cognitive efficiency than fathers of normal control children. These differences in background characteristics of the three groups of parents may be linked to the differential recruitment process of the three groups as well as to differences in the utilization of medical facilities among the three groups. The potentially confounding effects of these background variables on comparisons of psychological functioning in the three groups of parents was statistically controlled through the use of covariate adjustment procedures.

Results of comparisons of the psychological coping styles of parents of hyperactive, asthmatic and normal control children indicate that mothers of hyperactive children differ significantly from mothers of normal control children in terms of psychological well-being as well as the level of psychological defensiveness which they utilize in order to deal with the stresses in their lives. More specifically, they engage in a significantly greater level of repression and denial of their psychological conflicts, manifest a greater tendency to blame outside circumstances for their difficulties and turn their feelings of anger and frustration inwards than mothers of normal control children, and expend more energy in an attempt to strive for mastery of their situation. In spite of this increase in activation of psychological defense mechanisms which falls within the neurotic range in a continuum of impairment, mothers of hyperactive children manifest an overall lower level of psychological well-being than mothers of normal control children. This is reflected in a mild degree of clinical depression, lowered-self-esteem and a greater oversensitivity to the environment than is found in mothers of normal control children.

Mothers of asthmatic children fall between mothers of hyperactive children and mothers of normal control children with respect to the level of activation of these coping behaviours. Although they utilize a somewhat higher level of psychological defensiveness than mothers of normal control children, this

difference is not statistically significant. The contrast in the intensity of psychological defensiveness in mothers of asthmatic children versus mothers of hyperactive children may be partly linked to the influence of the disruptive behavioral component of hyperactivity on both the child and the familial environment which may necessitate a greater degree of psychological adjustment than the illness-related stresses which the parent of the asthmatic child is faced with. Furthermore, mothers of asthmatic children utilize a number of qualitatively different coping mechanisms. In contrast with mothers of hyperactive children, they manifest a significantly greater degree of social discomfort and social introversion. Parents of asthmatic children report a significantly lower level of marital satisfaction than parents of normal control children. These difficulties in interpersonal relationships may be etiologically linked with the development of the asthmatic syndrome in the asthmatic child.

No overall differences between fathers of hyperactive, normal control and asthmatic control children were found in this study. The finding of a selective psychological impairment in mothers in response to the stresses of raising a hyperactive child, as well as the nature of this impairment, provide support for the hypotheses put forth in the theoretical literature on the maternal response to chronic childhood illness. The results of this study suggest that the variable of parenting a

hyperactive child acts as a psychological stressor for the mother and not the father of the child (fathers of hyperactive children differ significantly from fathers of normal control children only in terms of their overall intellectual efficiency). Furthermore, it is suggested that mothers of hyperactive children experience a significant and partly unresolved feeling of loss which plays an important role in the dynamics of the psychological conflicts which they are presently grappling with. They harbour feelings of anger and frustration with their life circumstances, and partly handle these feelings by turning them inwards, resulting in a loss of self-esteem and a chronic sense of failure. This is consistent with the theoretical concept of the chronically ill child as the symbol of a "narcissistic" blow to the mother, whereby a both conscious and unconscious loss of the mother's wishes and expectations towards the child as well as a sense of failure in the parenting role give rise to feelings of devaluation and a breakdown in self-esteem. These results are therefore significant in providing empirical validation for the theoretical understanding of the maternal response to the chronically ill child, as well as in providing data regarding the specific psychological coping style which characterizes the mother of the hyperactive child.

The identification of a characteristic pattern of difficulties in psychological adjustment, including symptoms of depression, feelings of frustration and low self-worth, and an oversensitivity to the environment as well as an overall lowering in psychological

efficiency in mothers of hyperactive children is also of significance from a clinical perspective. These findings underline the importance of detection of problems of psychological adjustment, particularly in terms of depressive symptoms, in mothers of hyperactive children. This is of relevance not only to the mental health professional to whom the troubled family of a hyperactive child has been referred, but also to the family practitioner who can play a crucial role in the early identification of psychological difficulties in the mother of the hyperactive child. Finally, the increased understanding of the psychological conflicts which these mothers may be experiencing can aid in the formulation of appropriate psychotherapeutic treatment programs, on an individual or group basis for the family of the hyperactive child.

Further research in this area should focus on the child, the illness, the parents' characteristics and their marital satisfaction, and the family context. The question of the parental response to the child's illness can be further investigated with respect to the following variables: the personality of the child, the nature and severity of the illness, the child's response to his illness, the frequency of hospitalizations, the degree of parental involvement in the treatment of the illness, the nature of familial interaction patterns, and the influence of psychological treatment programs at the level of parents, family or group.

APPENDIX A

Dear Mr. and Mrs.

This letter is to inform you of a study which is presently being conducted by the Psychology Department of the Children's Hospital of Eastern Ontario and the School of Psychology of the University of Ottawa. The aims of this study are those of examining the impact of childhood illness on family functioning. More specifically, we are concerned with examining the ways in which parents respond to the incidence of illness in their children. We are thus contacting several groups of families whose children have utilized the services of this hospital over the past year.

Parents who agree to participate in this study will be invited to attend an interview of approximately one and a half hours duration, at which time they will be asked to complete a number of questionnaires concerning their child's behaviour, their marriage, and their own personal attitudes and behaviours. The identified child in each family will be asked to complete a brief vocabulary test. The child's teacher will also be asked to fill in a standardized rating form concerning his behaviour at school.

All information provided by parents, children and teachers will be kept in strict confidentiality. At no time will any of the participants' names be identified on any presentation of the information collected.

We will contact you by telephone in a few days time in order to provide further information and answer any questions you may have concerning this study. If your family agrees to participate in the study, we will arrange appointments at your own convenience.

Thanking you in advance for your consideration in this matter.

Sincerely,

John T. Goodman, Ph.D.,

Director,

Psychological Services.

Danielle Nahon, B.Sc

APPENDIX B

INFORMED CONSENT

This is to affirm that I was informed of, and agreed to participate in, an investigation conducted by Ms Danielle Nahon and Dr. John T. Goodman, Department of Psychology, Children's Hospital of Eastern Ontario, and School of Psychology, University of Ottawa. I will be asked to fill out several questionnaires and rating scales on my family, my own attitudes and behaviours, and my child's behaviour. My child's teacher will also be asked to fill out a rating scale describing various aspects of the child's behaviour.

I have been informed that my family is free to withdraw from the investigation at any time with absolutely no repercussions and that strict anonymity concerning all information is assured.

Child's name _____

Parent's signature _____

Witness _____

Relationship _____

Date _____

APPENDIX C

Dear Parents:

This form authorizes Dr. John T. Goodman and Ms Danielle Nahon to contact your child's teacher and school. All information will be treated with the strictest confidence and be used only for research purposes. At no time will any information that might lead to recognition of the subjects involved be made available to non-essential personnel.

Signature _____
Parents or Guardians

Child's name: _____
Address: _____
Telephone No.: _____
Date: _____
Teacher's name: _____
School: _____
Grade presently attended: _____

Appendix D

Raw Scores Obtained by Parents of Hyperactive, Asthmatic and Normal Control Children on Dependent Variables in the Study

Variables	Parents of Hyperactive Children		Parents of Normal Control Children		Parents of Asthmatic Control Children	
	M	SD	M	SD	M	SD
MMPI Scale I	51.24	6.16	49.60	5.63	51.61	8.68
F	55.57	7.11	51.63	4.54	56.53	9.11
K	51.68	9.35	56.53	6.75	54.44	8.16
1	52.45	9.50	51.42	5.17	52.62	9.44
2	61.00	13.19	54.18	7.65	54.17	11.38
3	58.18	7.89	53.84	5.55	56.58	8.32
4	58.53	10.29	47.74	5.54	55.86	10.53
5	54.21	9.64	52.53	10.48	54.44	13.31
6	57.76	7.56	51.89	7.25	56.92	8.55
7	55.95	9.89	51.58	7.80	52.75	8.57
8	52.02	9.59	49.05	7.82	53.64	9.59
9	53.08	13.65	50.15	9.78	53.78	9.01
0	53.18	9.99	51.89	8.32	55.14	9.77
TP	11.55	3.85	8.58	2.18	11.19	3.33
RS	54.77	16.64	53.29	11.11	51.11	13.02
Locke-Wallace Marital Adjustment Scale	106.79	27.50	121.55	18.72	104.86	21.10

Appendix E

Raw Scores Obtained by Fathers Pooled Together and Mothers Pooled Together
on Dependent Variables in the Study

Variables	Fathers Pooled Together		Mothers Pooled Together	
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
MMPI Scale L	51.32	6.95	50.29	6.88
F	53.55	6.45	55.54	8.15
K	53.43	7.70	55.00	8.91
1	51.55	9.18	52.75	7.13
2	55.86	11.31	57.12	11.46
3	56.00	8.18	56.39	6.80
4	53.82	10.76	65.20	9.49
5	47.00	8.36	60.43	9.43
6	56.34	8.20	54.66	8.10
7	53.50	8.77	53.37	9.15
8	51.25	8.74	51.82	9.62
9	50.05	10.99	54.57	10.73
0	56.16	9.24	50.59	8.77
TP	10.11	3.33	10.75	3.53
SD	55.89	12.87	50.28	14.15
Locke-Wallace Marital Adjustment Scale	110.05	24.79	112.30	22.90

Appendix F

Raw Scores Obtained by Mothers of the Three Groups of Children
on Dependent Variables

Variables	Mothers of Hyperactive Children		Mothers of Normal Control Children		Mothers of Asthmatic Children	
	M	SD	M	SD	M	SD
MMPI Scale L	52.84	5.85	49.42	6.26	51.72	8.48
F	55.74	8.05	51.10	4.87	53.83	5.37
K	51.89	8.32	55.68	6.22	52.67	8.30
1	52.84	10.75	49.58	3.63	52.28	11.39
2	61.47	12.45	51.47	5.30	54.56	12.69
3	60.00	7.89	52.05	5.07	55.94	9.38
4	60.00	12.11	47.21	4.73	54.28	10.20
5	47.58	5.36	45.95	8.61	47.50	10.75
6	59.58	6.08	51.95	7.12	57.55	9.47
7	56.42	10.30	50.79	7.61	53.28	7.56
8	53.21	10.68	49.26	8.25	51.28	6.66
9	52.89	15.59	46.10	7.56	51.22	6.72
0	53.68	9.58	55.05	9.00	59.94	8.34
TP	11.63	3.95	7.94	1.68	10.78	2.86
RS	56.84	16.29	54.84	10.47	56.00	11.67
Locke-Wallace Marital Adjustment Scale	104.63	29.35	121.74	19.76	103.44	20.75

Appendix G

Raw Scores Obtained by Fathers of the Three Groups of Children
on Dependent Variables

Variables	Fathers of Hyperactive Children	Fathers of Normal Control Children	Fathers of Asthmatic Children			
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
MMPI Scale T	49.63	6.18	49.79	5.09	51.50	9.11
F	55.42	6.26	52.16	4.25	59.22	11.27
K ₉	51.47	10.51	57.37	7.31	56.22	7.83
1	52.05	8.34	53.26	5.89	52.94	7.30
2	60.53	14.21	56.89	8.75	53.78	10.26
3	56.37	7.66	55.63	5.56	57.22	7.31
4	57.05	8.16	48.26	6.34	57.44	10.90
5	60.84	8.34	59.10	7.76	61.39	12.14
6	55.95	8.57	51.84	7.58	56.28	7.74
7	55.47	9.73	52.37	8.10	52.22	9.66
8	50.85	8.49	48.84	7.59	56.00	11.53
9	53.26	11.84	54.21	10.23	56.33	10.40
0	52.68	10.61	48.74	6.34	50.33	8.83
TP	11.47	3.85	9.21	2.46	11.61	3.77
RS	52.68	17.17	51.74	11.80	46.22	12.73
Locke-Wallace Marital Adjustment Scale	108.95	26.14	121.37	18.15	106.28	21.96

Appendix H

Age, Peabody IQ and Connors Hyperkinesis Scores Obtained by
Hyperactive, Normal Control and Asthmatic Control Children

	Hyperactive Children		Normal Control Children		Asthmatic Children	
	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>	<u>M</u>	<u>SD</u>
Age as of June 6/81	10 years, 1 month	1 year, 8 months	10 years	1 year, 8 months	7 years, 11 months	2 years, 3 months
Peabody ^a IQ Estimate	109.06	17.87	120.79	13.74	120.00	14.97
Connors Hyperkinesis Index	1.51	.64	.22	.23	.32	.31

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