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THE ASSOCIATION OF CHRONIC PHYSICAL ILLNESS AND EATING ATTITUDES IN SCHOOL-AGED CHILDREN. A SECONDARY ANALYSIS BASED ON A COMMUNITY SURVEY OF THE EPIDEMIOLOGY AND RISK FACTORS FOR EATING AND MOOD DISORDERS IN CHILDREN

by

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the School of Graduate Studies and Research
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appendix Childrens depression inventory

UNIVERSITÉ D'OTTAWA
UNIVERSITY OF OTTAWA

ABSTRACT

Children with chronic physical illness have twice the risk of psychosocial maladjustment as healthy children. Few studies of chronically ill children, however, have addressed specific emotional or behavioral problems. One specific aspect of mental functioning is abnormal eating attitudes, hypothesized to be an early stage of an eating disorder. To date, there has been no study of the association of a variety of physical chronic illnesses with a specific psychiatric syndrome in a diagnostically heterogeneous population, comparing chronically ill children with healthy children.

This study examined the association between chronic illness and eating attitudes in a population of school children from Western Quebec. A checklist of chronic medical conditions was added to the parent questionnaire in order to determine presence of chronic illness.

There were two objectives of this thesis. The first objective was to determine whether chronic illness was associated with eating attitudes in children, as measured by the Eating Attitudes Test. The second study objective was to determine whether there was a meaningful group difference in other psychometric scores of depression, family functioning and stress between children with a chronic illness and children without a chronic illness.

The data used were part of a large pilot project of eating attitudes and behaviors. Evidence of chronic illness was added to the data file for the sample, studied as a dichotomous variable. Validation of reported chronic illness was conducted by a hospital chart review. Four psychometric measures were included: the Eating Attitudes Test, the

Children's Depression Inventory. Children's Stress Inventories and the Family Assessment Device. Demographic variables used were grade of student. gender of student. family status and socioeconomic status.

As a validation tool. the medical charts did not serve well as a gold standard. Only 13 chronic illnesses were confirmed by chart review and another 6 new illnesses were identified and added to the data file. Agreement between the survey reports and the medical charts was only 46 per cent. It was concluded that other possible sources of validation may have improved the results.

Analysis of the data was conducted separately for each grade. A preliminary analysis of demographic variables showed no association between chronic illness status and gender. grade. family status and socioeconomic status. No significant group differences were found between chronic illness and eating attitudes. Similarly. discriminant function analysis was not successful as none of the psychometric measures discriminated between the study groups. Although this lack of difference may reflect reality. it is not possible to make valid conclusions based on this study given the problems with data quality and validity. especially with regard to poor sample size and power.

Since this study was a secondary analysis of data. data quality related to areas such as sample representativeness. study response and missing data was not directly influenceable by the writer of this thesis. Hypotheses not addressed in the original Children's Food and Mood Study. however. were tested in this thesis.

Given the serious physical consequences of a syndrome such as anorexia nervosa. more vigilance into the early signs of eating disturbance by the study of abnormal eating attitudes may be valuable.

Methodological recommendations to improve upon a small study such as this one are discussed.

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1. INTRODUCTION

1.1 Statement of the problem

Children with chronic physical illness have twice the risk of psychosocial maladjustment as healthy children.[1] Despite this risk, few studies address specific emotional or behavioral problems, relying instead on general and global ratings of adjustment.[2,3,4] One specific aspect of mental functioning not explored in a heterogeneous population of children with chronic physical illness is anorexia nervosa. Evidence in the general adolescent population suggests that abnormal eating attitudes may be an early stage in an eating disorder such as anorexia nervosa.[5] Since children with a chronic physical illness are at an increased risk for psychosocial maladjustment, their vulnerability to develop anorexia nervosa might be increased.[1] This study will examine abnormal eating attitudes in a heterogeneous population of children with chronic physical illness.

1.2 Study rationale

According to Pless, chronic illness is a medical condition, usually unpreventable, that lasts three months or more and that may require at least one month of hospitalization.[6] It can be either a physical or mental condition. This paper focuses on chronic physical illness, which will hereafter be referred to as chronic illness.

One goal in caring for a child with chronic illness is to minimize the impact of the physical disease on her emotional condition.[7] Chronic illness may not cause psychopathology directly, but a child with a long-term illness has an increased risk of developing such pathology. Her

vulnerability to the stresses of life may be increased in comparison with other children.[8] One response to this increased stress is to develop secondary handicaps.

Secondary handicaps are difficulties experienced by chronically ill children other than their underlying physical condition.[9] They are usually equated with psychological maladjustment, and operationally defined by the psychometric measure used in a study. Measures of self-concept, self-esteem, locus of control, life stress and clinical disorders (e.g., depression, eating disorders) have all been used to assess adjustment with a variety of populations.

2. REVIEW OF THE LITERATURE

2.1 Association of chronic illnesss and mental health and adjustment

Approximately 10% - 20% of North American children suffer from at least one chronic illness.[10,11,12] Improvements in treatments and services have increased the life span and changed the quality of life for many of these children.[13] As a result. management issues related to mental health and adjustment are now emerging as essential elements of care. Despite past debates. most reports from the literature have found children with chronic illness to have twice the risk of psychosocial maladjustment as healthy children.[1]

Population based studies

Early population based studies such as the Isle of Wight Study [14] from England and the Rochester Child Health Study [15] from the U.S. reported a higher prevalence of psychopathology in chronically ill children when compared to healthy children.[9] Chronically ill children were found to have a higher prevalence of psychiatric disorders. abnormal behavioral symptoms and school-related adjustment problems. A follow-up study of the Isle of Wight cohort indicated more adaptational problems in school. work and marriage for these children as adults.[16] More recently. the Ontario Child Health Study found chronically ill children had twice the risk of psychiatric morbidity as healthy children. This risk increased for chronically ill children with a long-term disability.[2]

Clinic based studies

Clinic based studies of children with single diseases (such as asthma, cancer, renal disease, arthritis and diabetes) have examined both general and specific aspects of psychological functioning. General assessments found these children to be less socially adapted, to have less self-esteem and to be more anxious when compared with healthy children.[17,18,19,20,21,22,23] Differences were more marked in some studies for those with severe disease.[21,22]

Specific reports measured depression and family functioning. Asthmatics with emotional disturbance were more likely to be depressed.[20] Similar findings were reported in children with cancer.[17]

An increased risk of familial dysfunction was found in families of children with asthma, diabetes, cerebral palsy and epilepsy.[24] Problems and conflicts normally experienced by a healthy child were believed to be intensified in these children because of the stress from trying to cope with an illness. Family members were excessively sensitive and responsive to each other's moods and needs, lacked individual autonomy, and had little respect for personal privacy. These patterns of familial interaction produced highly cohesive but socially isolated families where hostility and resentment emerged instead of open expressions of conflicting feelings.

No comparison of perceived stress, as "an influential event that produces either negative or positive consequences."[25] has been made between chronically ill children and their healthy counterparts. Research on stress conducted exclusively with chronically ill children has focused on issues such as increased vulnerability to disease and physiological

response.[26] Although there are several self-report measures of stress, they have only recently reflected perceived stress experiences in children rather than adult perceptions of stress.[27]

Disease subgroups with unique risks

Studies of maladjustment have also suggested differences in maladjustment between children with different chronic conditions. One study by Drotar et al found children with cystic fibrosis to function as well as their siblings and other healthy children. Other children in the study suffering from less severe diseases of the respiratory system (e.g., asthma) were less well psychosocially adjusted than cystic fibrosis patients, siblings of cystic fibrosis patients and other healthy children.[3] Therefore, the less severely diseased children were more maladjusted. This finding is in accordance with the "marginality" hypothesis which predicts more psychological maladjustment in the less chronically disabled than the severely disabled.[4,28,29]

Conclusion

Both population-based and clinic-based studies have suggested an increased risk of maladjustment in chronically ill children compared with healthy children. Studies of clinical populations, however, have failed to address specific mental functioning.[30] Often a comparison or control group in a tertiary care centre is not available or simply omitted. It is also difficult to apply conclusions to other subpopulations based on studies from tertiary care centres where the more severe and more complex disease is treated. A population-based study may include a variety of

chronic conditions from a variety of health settings. Therefore, it may be more representative than a clinical study. Specific mental functioning can be evaluated on a larger scale and differences in functioning may be comparable across disease subgroups.

2.2 A non-categorical approach to specificity of adjustment

Specialization in medical care, reflecting the variety of chronic illnesses, has enhanced the quality of life for many long-term patients.[13] This categorical approach to treatment, however, is limited. It is a specialized approach to medical care, but does not address other non-medical consequences of long-term disease such as secondary psychological handicaps.[31,32,33] A non-categorical or generalist approach to adjustment focuses on those psychological consequences which are common to all chronic illnesses.

Study of specific secondary handicaps

Chronically ill children have special needs[31] and have the potential to develop secondary handicaps stemming from their physical disease.[9] These handicaps are often psychological in nature and may affect a child's overall adjustment. They include emotional and financial costs of the illness for the child and their family.[12,31,34] Although the majority of studies with chronically ill children have attempted an evaluation of a child's general emotional and behavioral state, few studies have addressed specific aspects of functioning.[3,4] Instead, general and global ratings were used to describe psychiatric dysfunction.

One aspect of mental functioning not explored substantively in chronically ill children is abnormal eating attitudes which may be a risk factor for an eating disorder.

2.3 Abnormal eating attitudes

Abnormal attitudes toward weight control and dieting are a serious concern in today's youth.[35,36] Studies of eating disorders in student populations reveal that the prevalence of the syndrome of anorexia nervosa in both children and adolescents increased from 0.46% in 1974 to as high as 4.2% in 1983.[35] These figures may reflect an actual increase in the disorder, but it is possible that more recent reports are detecting the hypothesized milder or subclinical forms.[37]

One measure used to assess symptoms associated with anorexia nervosa is the Eating Attitudes Test (EAT). The EAT, developed by Garner and Garfinkel, is a self-report measure that contains single statements about anorexia attitudes and behaviors.[38] Symptoms surveyed included such areas as food preoccupation, body image for thinness and dieting.35

Early investigation into anorexia nervosa was conducted primarily with clinical populations. Recent research based on less selective and more representative community studies has detected its "milder" or subclinical forms known as partial syndrome, subclinical anorexia nervosa or more recently as abnormal eating attitudes.[5,39] These milder syndromes have been identified as potential cases and have a higher prevalence than anorexia nervosa itself.[5,39]

The full clinical syndrome of anorexia nervosa is characterized by extreme weight loss, a disturbance in body image, an intense fear of

becoming fat and amenorrhea. Its physical consequences may include severe malnutrition, gastrointestinal damage and heart failure.[40] In "partial syndrome" there is no significant weight loss, in spite of a major preoccupation with weight and no amenorrhea.[41]

The continuum hypothesis, proposed by Fries, suggests that conventional dieting may lead to anorexic behavior or may develop into anorexia nervosa.[37] Central to this hypothesis is the argument that "abnormal eating attitudes" are a common feature of all clinical syndromes associated with eating disorders and may represent an early stage in the development of pathology.[5,39] Therefore, the "partial syndrome" may be part of a continuum, ranging from milder forms of an eating disorder to anorexia nervosa.[41]

A number of community studies have reported abnormal eating attitudes in adolescents.[42] The latest evidence is from a prospective study of 1010 British schoolgirls who completed the Eating Attitudes Test. In a subsequent interview with selected subjects, the prevalence of the clinical syndrome of an eating disorder was estimated to be 0.99% and that of partial syndrome (excluding clinical syndrome) was 1.78%.[41] The same study followed up students classified as dieters for a twelve month period. A small proportion of these dieters became cases of anorexia nervosa, with their relative risk of becoming cases eight times that of non-dieters.[43] These dieters consisted of 31% of the population, consistent with earlier reports of 30% by Nylander[42] and 37% by Dwyer.[44] Although more research is needed in order to establish the relationship between the partial and clinical syndromes, it is evident that abnormal

eating attitudes may pose a serious threat to the well-being of children and adolescents.

2.4 Investigating abnormal eating attitudes in the chronically ill

An eating disorder such as anorexia nervosa may have serious consequences for chronically ill children.[45] Evidence of specificity of maladjustment in chronically ill children involving eating disorders, much less abnormal eating attitudes,however, is scarce.[4] Most research in this area has been on insulin dependent diabetics and more recently on cystic fibrosis patients.[46]

The association of eating disorders in the adolescent diabetic continues to be an important issue to clinicians. The highest incidence rates of insulin dependent diabetes mellitus (IDDM) have been reported in the 10 to 14 year age group, an age group most at risk for an eating disorder (namely anorexia nervosa).[47] Since insulin treatment may lead to weight gain, IDDM patients, especially females who are known to be conscious of their potential weight gain, may diet or adjust their insulin intake. This may lead to poor glucose control. For example, in diabetic patients who fulfil the diagnostic criteria for an eating disorder, there is evidence of higher concentrations of glycated hemoglobin in their blood than in patients without evidence of an eating disorder.[48] These higher levels of glycated hemoglobin may have acute adverse effects on a patient causing hyperglycemia, hypoglycemia and possibly diabetic ketoacidosis. If control remains consistently poor, severe long-term complications may result, such as neuropathy and retinopathy.[45]

Research into the association of cystic fibrosis patients and eating disorders has not been as extensive as in diabetics. The emphasis is on the development of symptoms related to eating disorders rather than on consequences of eating disorders on the disease. In a study comparing self-reports of a young group of cystic fibrosis patients (aged 8 - 15 years) with an older group (aged 16 - 40 years), younger patients with an elevated Eating Attitudes Test score were more likely to manifest significant disturbances in eating such as a resistance to food, a preoccupation with food and using food as a method of control. Older patients with high Eat scores reported more symptoms of anxiety and depression.[46]

2.5 The association of other psychological factors with eating disorders in children

The presence of abnormal eating attitudes as part of a continuum of eating disorders is becoming an important issue for adolescents. Therefore, other psychological factors associated with eating disorders in the general population of children such as depression, family functioning and stress also require attention.

Evidence from the literature shows an association between depressive symptoms and anorexia nervosa in both prepubertal and adolescent children.[49,50] In a study by Herzog, 50% of anorexic patients met criteria for a depressive disorder.[51] In a review of clinical reports, psychometrics, family history, drug studies and follow-up studies, Swift also confirmed the relationship between anorexia nervosa and depression. However, the nature of this relationship was thought to

be unclear, especially with respect to which psychiatric syndrome occurs first.[52]

The relationship between family dysfunction and anorexia nervosa differs in children and adolescents. This association is stronger in prepubertal children than in their older peers.[25] It may be because younger (prepubertal) children are more dependent on their family than are adolescents, as hypothesized by Gislason.[25] As a result of this, relationships within the family are more important than issues of identity and autonomy, known to be associated more with anorexia nervosa in adolescence.

Stress may also contribute to the onset of anorexia nervosa. From a review of 22 case studies, Gislason defined stress as a "precipitating event" to early onset anorexia nervosa[25], like the birth of a sibling, mother's pregnancy or family arguments.

In spite of the extensive literature on stress, none of the studies actually measured a child's perception of stressor events. Most research in this area has been based on parental reports, rather than the self-perceptions of a child. A recent inventory of stressful events designed to capture self-reports of children has proved to be a valid and reliable measure in students from Grade 4 and Grade 7.[27]

2.6 Conclusion: Abnormal eating attitudes as a mental health and adjustment issue for chronically ill children

This review advocated a generic or non-categorical approach to chronic illness in considering mental health and adjustment issues in children. It introduced some significant psychological issues relevant to chronically ill children, and addressed the specific problem of eating

disorders through the study of one potential risk factor, abnormal eating attitudes.

The study of abnormal eating attitudes as an early aspect of an eating disorder such as anorexia nervosa is highly relevant in children with long-term illness. Anorexia nervosa has severe physical consequences for the victim, often resulting in persisting problems and even death. These physical consequences may lead to a deterioration of the chronic illness, especially in the long-term. Abnormal eating attitudes are a specific aspect of mental functioning not explored in a diagnostically heterogenous population of chronically ill children compared to healthy children. Studies of abnormal eating attitudes as an early stage of an eating disorder are usually reported for one disease (such as diabetes or cystic fibrosis) rather than for a group of different diseases. Because of their hypothesized relationship to anorexia nervosa, this study attempted to compare abnormal eating attitudes in a diagnostically heterogeneous population of chronically ill children with healthy children. The effects of depression, family functioning and stress associated with anorexia nervosa were also examined.

3. STUDY PURPOSE, OBJECTIVES AND HYPOTHESES

3.1 Study purpose

A review of the literature found no study of the association of physical chronic illness with a specific psychiatric syndrome in a diagnostically heterogeneous population, comparing chronically ill with healthy children. The purpose of this thesis will be to determine the association between chronic illness (as reported by parents) and eating attitudes (as measured by the scores on the Eating Attitudes Test) in Grade 4 and Grade 8 children from the Protestant School Board of Western Quebec. Other factors related to eating disorders will also be investigated.

3.2 Objectives

Study objective 1:

To determine whether chronic illness is associated with eating attitudes in children, as measured by the Eating Attitudes Test.

Study objective 2:

To determine whether there is a meaningful difference in other psychometric scores of depression, family functioning and stress between children with chronic illness and children without chronic illness.

3.3 Hypotheses

Hypothesis 1

Children with chronic illness will differ from children without chronic illness on their mean score on the Eating Attitudes Test.

Hypothesis 2

Children with chronic illness will differ from children without chronic illness on at least one mean psychometric test score of depression, family functioning or stress.

4. STUDY DESIGN AND METHODS

4.1 Description of the study

This study was a secondary analysis of data from the Children's Food and Mood Study, a research project of the Royal Ottawa Hospital in conjunction with the University of Ottawa School of Medicine. Its design was cross-sectional in nature as chronic illness and eating attitudes were measured simultaneously. A checklist of chronic medical conditions was added to the parental questionnaire component of a subsample of the study by the present author. The first part of this thesis was a validation of the parental report of chronic illness. This validation was accomplished by means of a chart review at the Children's Hospital of Eastern Ontario. The second part of this thesis was an analysis of the data collected, including the results of the validation study. This thesis concludes with a discussion of the results and some recommendations to improve upon the methods of investigation used in the larger study.

4.2 The database

The Children's Food and Mood study was designed and conducted by Dr. V.F. DiNicola, a child psychiatrist at the Royal Ottawa Hospital, in selected schools in Ottawa, Ontario and Western Quebec during the 1990 - 1991 school year. It was the first large scale epidemiological study of children's eating attitudes and behaviours and associated features. It was also the first time the adapted Eating Attitudes Test, designed specifically for prepubertal children, had been used on such a scale.

The larger project consisted of two stages: a self-completed questionnaire and an interview on a subset of the sample. For the purposes of the present study, the first stage, the survey, was used.

At the survey stage (with school board co-operation), children and their parents completed several self-report measures. Parents also completed a demographic questionnaire and a brief checklist indicating whether or not their child suffered from chronic illness. The height and weight of each child were recorded by a research assistant concurrently with the administration of test measures to the child.

A follow-up interview was included in the original Children's Food and Mood Study in order to confirm potential cases of eating disorders and other psychopathology (e.g., depression, family dysfunction). These follow-up results were not used in the present investigation.

4.3 Study population

The subjects recruited into the study were students, both boys and girls, in grades 4 and 8 (mostly ages 9-10 and 13-14 years, respectively) from the English Protestant Regional School Board of Western Quebec. The sampling of these students was by convenience, in that participating classes were chosen for two reasons: availability and practicality. Selection into the study was based on the approval of the school board and the school principal. Thereafter, all students in a particular grade were available to participate in the study. Classes were also selected for reasons of practicality (e.g., exclusion because distance too far for data collection or class too small to justify a visit) and children only participated with written parental consent.

The Protestant Regional School Board of Western Quebec is made up of three administrative areas: the Greater Hull Administrative Area, the Pontiac Administrative Area and the Northwestern Quebec Administrative Area. The Northwestern area was not included in the study because of the distance of the schools from the study centre. It was felt that the other schools were representative enough in that the Greater Hull area was an urban population and the Pontiac area was a rural population. This made them similar to the population in the Ottawa area school boards that participated in the first phase of the study.

The participating schools in Western Quebec were either elementary (Grades 1-6), junior high (Grades 7-8) or high schools (Grades 7-11). Therefore, the Grade 4 and Grade 8 classes were always in different schools, the former in an elementary school and the latter in a junior high or high school.

4.4 Study procedure

A review of The Children's Food and Mood Study proposal was undertaken by the school board personnel of the Protestant School Board of Western Quebec in the summer of 1991. Approval of the project for the schools under the board's jurisdiction, was granted shortly after the 1991-92 school year had begun. In September and October of 1991, study packages were distributed to each of 646 eligible students to take home to their parent(s). The study package contained a letter describing the study, a parental consent form and the Parent Questionnaire. Parents were asked to return the consent form to their child's teacher indicating whether or not their child would participate. A testing session for the

children in each participating class for whom consent had been received was arranged by the research assistant in cooperation with school personnel. Parents who agreed to participate in the study were asked to complete the test package and mail it to the study investigator in the self-addressed envelope provided for them. The completed Parent Questionnaire served as the consent form for the participating parent (Appendix A: Study Consent Form and Parent Questionnaire).

In-class group testing at each of the nine participating schools was conducted from October 9 to November 12, 1991. On the day of the testing a class list of all study participants with their dates of birth was given to the research assistant. Attendance of each participant was verified and administration of the test instruments followed. The Grade 4 students had the test instructions and the test contents read out to them by the research assistant. The Grade 8 students read the test instructions and test contents by themselves. Each student's height and weight were recorded by the research assistant. After the session, the completed test packages were returned to the research office by the research assistant (Appendix B: Children's Test Package).

After classroom testing, it was found that a number of parents did not send back the Parent Questionnaire. A follow-up call was made to each of the parents whose child participated in the study, in order to improve the response rate and increase the complete number of total cases (both child and parent questionnaires answered). This follow-up was strictly a reminder call for parents who had not sent back the questionnaire by the end of November: it was not the intent of the investigator to use these

calls to convince the parent to complete the questionnaire if they expressly indicated that they were not interested.

Seventy-four parents did not return their questionnaire, although their child had participated. Successful contact was made with 67 parents. In all, 18 (27%) of these parents sent back their study package during the period of November 30, 1991 and January 18, 1992 (Appendix C: Telephone Follow-up Procedure).

4.5 Study data

Demographic variables

The school, age (or grade), sex, family status and socioeconomic status of the respondent were selected for inclusion in a final datafile from an extensive collection of demographic variables. No data were collected on the educational status of either parent or on family income. However, the Blishen scale used for coding socioeconomic status in the present study implied both educational level and income in its scale construction.[53] Although data were available on a variety of other variables such as religion and the like, these variables were not used in the present study.

Exposure variable: chronic illness

The exposure variable was the parental report of chronic illness added by the author and completed by the parent as part of the Parent Questionnaire. This question was adapted from the Ontario Child Health Study (OCHS).[10] The OCHS's primary purpose was to determine the

prevalence and distribution of chronic and mental illnesses and the limitations in normal functioning in children 4 to 16 years of age. Its intent was not to estimate a specific disease prevalence, but to contrast children with and without chronic health problems. This was also the intent of the present study.

In the OCHS, the introduction to the checklist of chronic medical conditions asked of the parents, was phrased in the following way: " .. The following is a list of health problems or conditions that some children have. For each one, please indicate whether your child presently has it." It was felt that this question was not specific enough for the present study. Therefore, the second sentence was rewritten to read: "Please indicate whether your child has experienced at least one of these during the past year." The time frame of a year was used in order to exclude children whose illnesses had been inactive for a long time. (More details on the length of illness will be given in the description of the validation study.)

Although there were other questions in the Ontario Child Health Study that asked parents about other aspects of their child's illness (e.g., limitation of normal functioning, vision problems and health care utilization) these were not included in the present study. The Parent Questionnaire was already quite lengthy, therefore the addition of only one question was considered practical enough.

Operationalizing the term "chronic condition"

The definition of chronic illness presented earlier in this paper's literature review was illness lasting at least 3 months.[12, 13] Cadman et

al used a duration of 6 months.[10] The present study used a duration of one year. This conservative length of time was chosen to exclude more transient conditions and to identify more serious problems.

Assembling the list of conditions: consultation with physicians

The present study definition of chronic illness, together with the prevalence results from the Ontario Child Health Study, was shown to two practising physicians (a pediatrician and a family physician). They were asked to assemble a list of chronic illnesses which might be found in children who attend a regular school.[54] For example, cystic fibrosis was included as a chronic illness, despite the fact that it shortens life span. Children with cystic fibrosis attend regular school in the early stages of their disease when they are more mobile and do not require intensive treatment.

As a result of the consultation, the modified question in Table 4.1 was used in order to obtain a parental report of the known presence or absence of chronic illness. It should be pointed out that "hay fever or some other allergy" was included as a category in the checklist in order to differentiate it from reported asthma and also to separate it from actual chronic physical illness for analyses, as was done in the Ontario Child Health Study. In this way, only children with the most troublesome chronic health problems would be identified.

TABLE 4.1. Chronic illness survey question

The following is a list of long-term health problems or conditions that some children have. For each one, please indicate whether your child has experienced at least one of these during the past year.

	YES	NO
a) asthma	____	____
b) hay fever or some other allergy	____	____
c) a heart problem		
If yes, please state what type of problem _____	____	____
d) epilepsy, convulsions or seizures with or without fever	____	____
e) insulin dependent diabetes (juvenile)	____	____
f) arthritis	____	____
g) cystic fibrosis	____	____
h) hemophilia or other bleeding	____	____
If yes, please state what type of problem _____		
i) cerebral palsy	____	____
j) hearing or speech impairment	____	____
If yes, please state what type of problem _____		
k) leukemia	____	____
l) other long term health problem not mentioned above		
If yes, please state type of problem _____	____	____

Exclusion criteria

There were two groupings of exclusion criteria. The first group consisted of existing chronic conditions that would exclude a child from the study. The second group listed conditions that would be excluded from the present definition of chronic illness, but allow a child to remain in the study.

Exclusion from study:

1. Any physical deformity which makes it difficult to chew or digest food and/or which may require use of tube or intravenous feeding, e.g., cleft palate; and
2. Any diagnosed chronic psychiatric disorder (e.g., attention deficit disorder with or without hyperactivity, hyperactivity, depression).

Exclusion from definition of chronic illness:

1. Any allergy due to drugs (e.g., penicillin);
2. Any allergy due to food (e.g., dairy products, protein intolerance); and
3. Other conditions, either acute or recurring, not likely to be of a serious nature (e.g., tonsillitis, acne, skin rashes, migraines and headaches).

The first two exclusions were based on the assumption that the physical condition and/or prescribed medication for that ailment might already cause some problems in psychological functioning and appetite. These assessments were dependent upon the parent's reponses to question

"1" in the checklist. (In fact. no such exclusions occurred.) The last three exclusions refer primarily to the "allergy" category. A drug or food can be avoided. while a respiratory allergy. such as hay fever. which is included in the chronic illness list. cannot.

Outcome variables

A series of self-administered (or self-reporting) psychometric tests were completed by a child and parent who participated in the study. These tests described the behavior of the children as reported by themselves or their parents. They may also serve as screening devices for possible behavioral or psychosocial problems in the child and/or her family. Clinical cutoff points for three of the tests have been reported in the literature. However. they are not meant to be used solely as a clinical assessment tool. A brief description of each measure is presented below:

Adapted Eating Attitudes Test

The shorter version of the Eating Attitudes Test (EAT-26) which correlated highly with the original 40 item EAT was adapted for use with younger children with a third grade reading level.[55] The original EAT was made up of one sentence statements of anorexic attitudes and behavior. The adapted version consists of the short version of the EAT (i.e.. 26 items) with an added item concerning binge eating for total of 27 items. The rating of each response is answered by means of a six point Likert scale ranging from "always" to "never" with pie chart drawings accompanying the response set for easy comprehension (see Appendix B). Validation of this newly adapted version was conducted on 380 girls in

Grades 4.6. and 8 in North Carolina: internal consistency was .70 (Cronbach's alpha) and test-retest reliability was .79.[56]

Children's Depression Inventory

This 27-item inventory. based on the original Beck Depression Inventory for adults. is a symptom-based measure of depression.[57] The suicide item was deleted by request of the school board officials. Items are answered on a three point scale that quantifies depressed mood. The CDI's internal consistency was .87 based on a large public school population.[56] Its test-retest reliability was .84 over a nine-week interval.

Daily Hassles Inventory

This inventory was part of a series of children's self-report stress measures designed specifically to evaluate a child's subjective stress experience.[27] Items for this scale were compiled from results of circle group discussions with Grade 4 and Grade 7 children. Each question consisted of two parts. The first part of the question asked whether a certain event occurred. The second part of the question addressed the stress experience by a 4 point Likert scale ranging from "no trouble" to "very stressful". Test-retest reliability was high for both Grade 4 (.83) and Grade 8 (.86) over a two-week interval. No clinical cutoff has been published for this scale.

Family Assessment Device (General Functioning Subscale)

The General Functioning Subscale (GFS) is a brief 12-item 4-point scale from the 60-item McMaster Family Assessment Device (FAD) to be completed by parents. [58,59] Scores on this subscale correlate highly with the total FAD score. The internal consistency of this subscale was independently assessed by the Ontario Child Health Study and was found to be consistent with the original psychometric analysis.

4.6 Validation

Rationale

A validation study was conducted in order to confirm the parental report of chronic illness. This was done through a review of patient charts from the Children's Hospital of Eastern Ontario (CHEO). Cases were selected for the chart review if a Parent Questionnaire was completed. In order to clarify the reasons for the validation at CHEO, a brief description of the delivery of care patterns at this pediatric hospital will be provided.

CHEO is a regional tertiary care centre for children, who are residents of Eastern Ontario and Western Quebec, which have a combined population close to 1 million. The hospital provides comprehensive care for a number of conditions such as diabetes, cystic fibrosis, nephritis, neurological problems, pediatric conditions requiring surgery, and hematological and oncological conditions. Since September of 1991, CHEO has been a regional heart transplant centre with only an exceptional case being referred to the Sick Children's Hospital in Toronto. Previous to

this, children requiring transplants were referred to Montreal if born in the province of Quebec and Toronto if born in Ontario.

Despite the regionalization of health care advocated in Quebec at present, many children living in this province still find their way into the medical care system in Ontario. This is especially true if subspecialist consultation, hospital treatment and continued care and counselling are needed. Therefore, it was felt that a validation of the parental reports of chronic illness using charts solely from the Children's Hospital of Eastern Ontario is justified at this time. Further study of a sample in Western Quebec would necessitate additional investigation of Quebec medical care.

Validation procedure

The patient record was intended to serve as the gold standard. This meant that any chronic illness recorded in the patient chart confirmed the parental report of chronic illness. Prior to conducting the validation seven possible scenarios were identified:

1. The patient record confirms the same illness in the parental report (true positive);
2. The patient record confirms the parental report, but reports another chronic illness in addition to the parental report (true positive);

3. The patient record reports a chronic illness different from what was reported by the parent (considered a true positive, in line with the non-categorical approach to chronic illness used in this thesis);
4. The patient record reports a chronic illness, but the parent did not (false negative);
5. There was no record of a chronic illness in the patient chart, but a parent indicated that their child suffered from at least one chronic illness (false positive);
6. The patient record and the parental report did not mention a chronic illness (true negative); and
7. There was no patient record (unable to validate).

Permission for chart review was obtained from the ethics committee of the Royal Ottawa Hospital and the president of the Children's Hospital of Eastern Ontario; Both of these authorities indicated that parental consent would not be necessary. The CHEO medical records personnel were provided with a list of all children whose parent had answered the questionnaire and whose date of birth was known. The procedures for extracting charts were as follows:

1. If a medical chart at the hospital matched the name and date of birth of the child on the study list, the chart was pulled.
2. If there was no date of birth for a child, but the child had an uncommon name, the chart was pulled.

3. If there was no available date of birth from the study record and if the child had a surname for which there were numerous charts available (e.g., "Brown") no search was made for this child's chart.

Chart review was conducted in October and November of 1992. From an overview of the first 20 charts, the following validation rules were established:

1. Any physical chronic illness recorded during 1990 was considered a chronic condition. This guideline was interpreted leniently to include illnesses in November and December of 1989 and in January and February of 1991; and

2. If a condition was identified as chronic more than five years ago, and there was no evidence of other follow-up treatment or consultation at the hospital after the initial recording of the illness, then this condition was not recorded as chronic. This ruling was carried out for asthma, but not for a serious and permanent condition such as cystic fibrosis and hydrocephalus. In the latter case an assumption was made that the patient sought treatment elsewhere (e.g., Western Quebec). In this situation, the illness was recorded as chronic. (That is, the asthma may be a brief episode, therefore an acute condition, but cystic fibrosis is a definite long-term chronic illness.)

4.7 Data management

4.7.1 Description of the datafile

The research assistant of the Children's Food and Mood Study was responsible for coding the responses from the original parent and child questionnaires. The coded responses were then transferred onto datasheets designed for use in the study. These datasheets were used to enter data via the X-edit mode of CMS, the University of Ottawa's mainframe computing facility and with the program Epiinfo. A case was considered complete if the questionnaire was answered by both the child and the parent. All

complete cases made up the final datafile that was used for analysis. If a chronic illness was identified in the patient chart (as a result of the validation study), but not in the Parent Questionnaire (missing response or no reported chronic illness), it was added to the final datafile before data analysis.

The original dataset of the Food and Mood Study consisted of 443 variables. A smaller dataset was generated from the original datafile in order to facilitate data processing (Appendix D: List of variables used in thesis).

4.7.2 Rate of data entry error

Frequencies were run in order to examine the database for data entry discrepancies. In addition to this, every tenth case was manually selected from a printout of the complete database, for a total of 36 cases. Computer entered data for each of these cases were checked against the original questionnaire responses for entry errors. The data entry error rate was based on the total number of incorrect responses (for cases overall) divided by the number of possible response cells for 36 cases. An error rate of 0.25%, was calculated.

4.7.3 Variable classification

The manner in which some variables are used in the dataset and how this may effect the interpretation of the results require some brief explanation.

Since this paper supports a non-specific approach to chronic illness, the impact of specific diseases is not relevant. Instead

children with and without a long-term health problem are considered. Chronic illness (CHRONIC) was therefore treated as a categorical variable. A score of one indicated the presence of at least one chronic illness. while a score of two indicated its absence. Allergy was not coded as a chronic illness.

The scores from the psychometric tests were treated as continuous except when otherwise stated. This would maximize the power of the statistical tests used. since a continuous variable retains more information than a categorical variable. The scales. their abbreviations and their respective respondents are listed in Table 4.2.

TABLE 4.2. List of psychometric scales

Name of scale	Variable name	Respondent
Eating Attitudes Test	EAT	child
Children's Depression Inventory	DEPRESS	child
Daily Hassles Inventory	STRESS	child
Family Assessment Device	FAMILY	parent

4.8 Data analysis

Data analysis was conducted using the Statistical Package for the Social Sciences (SPSS-X) version 3.0 from the University of Ottawa's mainframe computing facility. Results of the analysis are reported separately for each grade in order to account for developmental differences in the students. In some cases a comparison of psychometric

scales across grades was not possible because different age-specific tests were used (e.g., stress inventories).

Group differences, based on chronic illness status, were tested using the appropriate statistical test (Mann Whitney U Test and Student t-test).

Discriminant analysis was used in order to determine whether there were any psychometric tests that distinguished the chronically ill group from the healthy group. This analysis would derive a discriminant function based on a linear combination of all individual psychometric test scores (Eating Attitudes Test, the Children's Depression Inventory, the Family Assessment Device and the Daily Hassles measures) so as to maximize the difference between the study groups. Including the Eating Attitudes Test as a variable in the discriminant function would also test the influence of other psychometric variables on the relationship between chronic illness and eating attitudes. A linear equation of the proposed function is given below:

$$D_{CHRONIC} = \beta_0 + \beta_1 EAT_1 + \beta_2 DEPRESS_2 + \beta_3 STRESS_3 + \beta_4 FAMILY_4$$

4.8.1 Study power

Calculation of the expected study power was done using Cohen's formula based on the t-test for means[60] (Appendix E: Formulas for Calculation of Study Power; Appendix F: Numerical Components of Power Calculations). Cohen's medium effect size of 0.5 was considered appropriate for the present study. This standarized difference was based on results of a study comparing mean Eating Attitudes Test (EAT) scores

from the EAT-26 in patients with anorexia nervosa and female university students.[61] Calculation of the effect size in that study was found to be 1.9 (after adjusting for unequal sample sizes and variances) based on a score difference of 26.2 between the two groups. This is quite a large effect size and yields a power of 99%.[59] An intragroup comparison from a public school population would not be expected to have such a large difference in EAT scores as one in which comparisons were made with a clinical population. The medium effect size of 0.5 would result in a mean EAT score difference of approximately 6.9 between the the chronically ill and the healthy group. Table 4.3 shows expected power based on a moderate effect size of 0.5, the observed sample size (adjusted for unequal samples) and an alpha level of 0.05.

TABLE 4.3. Predicted study power in chronically ill children compared to children without a chronic illness in order to detect an effect size of 0.5 in the mean score of the Eating Attitudes Test

Grade	adjusted N*	power**
4	45	75%
8	29	59%

* Cohen's correction for unequal sample sizes based on a computation of the harmonic mean.[59]

** assuming alpha level is 0.05

5. RESULTS

5.1 Descriptive statistics

5.1.1 Study response

646 study packages were distributed to the students in the schools. A student response rate of 50.8% and a parent response rate of 48.3% was achieved. Table 5.1 shows responses by grade for student and parent participants. 367 questionnaires were completed by either a parent or a child. There were 328 student respondents and 312 parent respondents. Greater participation was observed for both students and parents in the Grade 4 group. Response by gender was generally the same in Grade 4 students. but Grade 8 females had higher response rates than Grade 8 males. Data from both parent and child respondents were available for 273 subjects.

TABLE 5.1. Study response by grade in the study of eating attitudes and chronic illness

	Grade 4		Grade 8		Total	
Packages Sent	296		350		646	
Respondents*	#	%	#	%	#	%
Student	190	(64.2)	138	(39.4)	328	(50.8)
Parent	177	(59.8)	135	(39.0)	312	(48.3)
Either	206	(69.6)	161	(46.0)	367	(56.8)
Both	161	(54.4)	112	(32.0)	273	(42.3)

* Response by percent are based on the total number of packages sent for each grade and the total number of packages sent overall.

A breakdown of the study response by an individual school can be found in the appendix (Appendix G: Study Response by School). A response rate of at least 50% was achieved for students in Grade 4 from all schools and from their parents. A marked difference was observed for Grade 8 students and their parents where response rate in one school was as low as 33.1% for students and 35.6% for parents.

5.1.2 Characteristics of the population

There were nine participating schools in the Children's Food and Mood Study. The age range for Grade 4 was from 9 to 11 (mean = 9.60) while for Grade 8 it was 12 to 15 (mean = 13.79). The study group by gender was almost evenly split, with 49% (181) girls and 51% (186) boys.

Chi square tests were run in order to determine if there were any significant differences in prevalence of chronic illness by age, gender, family status and socioeconomic status (Appendix H: Prevalence of reported chronic conditions by age, sex, family status and socioeconomic status). No significant differences were found.

5.1.3 Reports of chronic illness

5.1.3a Parental reports

Results of the parental report of chronic illness revealed that of the 273 complete questionnaires (where there were both child and parent responders), six of the parents did not answer the question on chronic illness (Table 5.2). Of the remaining 267 parent responders, 40 (15%) reported that their child suffered from a chronic illness (excluding allergy). Percent of chronic illness was similar in both grades (15%). A breakdown of individual chronic illness revealed 35 reports of asthma (Grade 4: 19; Grade 8: 16) and 7 hearing and speech impairments (Grade 4: 6; Grade 8: 1). One child from each grade suffered from both asthma and a hearing and speech impairment for a total of 42 reported illnesses. The most common chronic illness reported in either grade was asthma.

TABLE 5.2. Frequency and percent of total reported chronic illness of child by parental report

	Grade 4	Grade 8	Total
No. of Respondents	161	112	273
No. of Respondents Answering Chronic Illness Question	158	109	267
Chronic Illness	24 (15.2%)	16 (14.7%)	40 (15.0%)
No Illness	134 (84.8%)	93 (85.3%)	227 (85.0%)

5.1.3b Validation study

A total of 187 charts (60%) were made available for review from the 312 children whose parents had completed a questionnaire. Breakdown by grade consisted of 103 and 84 charts pulled for Grade 4 and Grade 8 respectively. There were no charts at CHEO for 115 (36%) of the children (68 from Grade 4 and 47 from Grade 8) and 9 (3%) charts were missing. One child's chart could not be pulled because she had a common surname with no recorded date of birth (Appendix I: Hospital Chart Search Results).

Results of the validation study are given in Figure 5.1. The "hospital chart" served as the gold standard in order to verify the "parental report" of chronic illness. 19 children were identified from the charts as having at least one chronic illness. Of these cases, 13 were confirmations of the parental report and 6 were new reports of chronic illnesses identified solely from the charts. One child was confirmed to have both asthma and a hearing and speech impairment. Another 19 children were reported to have a chronic illness, but no

chronic illness was recorded in the hospital chart. Finally, 149 children were identified with no chronic illness in both the hospital chart and the parental report. These remaining charts reported acute conditions requiring emergency room visits such as ankle injuries, broken arms and superficial wounds to the head.

Figure 5.1. Results of the validation study using hospital charts in order to confirm survey reporting of chronic illness

		Hospital chart: chronic illness	Hospital chart: no chronic illness	total
Survey	chronic illness	13 (a)	19 (b)	32
	no chronic illness	6 (c)	149 (d)	155
		19	168	187

a= The number of children reported by the parent to have chronic illness and confirmed by the hospital chart. This may be the same illness present in the parental report or a different chronic illness.

b= The number of children reported by the parent to have chronic illness, but no chronic illness found in the hospital chart.

c= The number of children with chronic illnesses only identified from the patient chart.

d= The number of children identified as not having a chronic illness in both the hospital chart and the parental report.

Sensitivity of the parental report for identifying a chronic condition recorded in the hospital chart was moderate at 0.68, while the

specificity of identifying a child not suffering from chronic illness was slightly higher at 0.89. Agreement between the hospital chart (gold standard) and the survey on presence of chronic illness was 0.87 or 87 percent. In order to correct for chance agreement Cohen's Kappa was used and yielded a Kappa of 0.46 or 46 percent.

Of the six new cases of chronic illness that were identified through the chart review, three were found in Grade 4 students (two chart entries of asthma and one chart entry of a hearing and speech impairment). The other three cases were found in the older children under the category "other chronic illness". They consisted of gross hematuria, hydrocephalus and an adenylate deaminase deficiency (Table 5.3).

TABLE 5.3. New reports of chronic illness identified by hospital chart review

Chronic illness	Grade 4	Grade 8	Total
Asthma	2	0	2
Hearing/speech impairment	1	0	1
other	0	3	3
TOTAL	3	3	6

5.1.3c Consolidated results

Following review of the validation study results, it was decided to accept any evidence of chronic illness, whether from the chart information or the parental report. Chart information was assumed to be valid. A report of chronic illness by the parent (without a chart confirmation) was also accepted, as it was possible that the child may have received care for the chronic illness in Gatineau, Quebec.

A grade breakdown of chronic illness incorporating the parental reports and chart review results can be found in Table 5.4 and an individual breakdown by grade is given in Table 5.5. These combined results consisted of all true positive, false positive, and false negative reports of chronic illness (see section 4.6).

TABLE 5.4. Frequency and percent of children with chronic illness by parental report and hospital chart review

	Grade 4	Grade 8	Total
No. of Respondents	161	112	273
No. of Respondents Answering Chronic Illness Question	158	109	267
Chronic Illness	27 (17.1%)	19 (17.4%)	46 (17.2%)
No Illness	131 (82.9%)	90 (82.6%)	221 (82.8%)

TABLE 5.5. Individual chronic physical conditions, by grade from parental reports and chart review

	Grade 4	Grade 8	Total
Chronic Illness			
Asthma	21	16	37
Hearing or speech impairment	7	1	8
Other long-term health problem	0	3	3
Total chronic illnesses	28	20	48

In all, a crude total of 48 chronic illnesses were identified by combining the parental survey and the chart results. Since there was one student identified with more than one chronic illness in each of Grade 4 and Grade 8 (asthma combined with a hearing and speech impairment in each case), the actual number of children with chronic illnesses was 46 (Grade 4 = 27; Grade 8 = 19). The overall prevalence of at least one chronic illness was, therefore, 17.2% (Grade 4: 17.1%; Grade 8: 17.4%). Since the sample size selected was based on the prevalence of all chronic illnesses, individual prevalence estimates of specific illnesses are not reported as these would be imprecise.[10]

The remainder of the statistical analysis was conducted on cases for which there were data from both the child and the parent. As stated earlier, this consisted of a total of 267 questionnaires. Analysis by grade yielded 158 cases from Grade 4 and 109 cases from Grade 8.

5.1.4 Psychometric tests

5.1.4a Characteristics of the distributions

Normality

None of the psychometric test scores was normally distributed (Appendix J: Kolmogorov-Smirnov Goodness of Fit Test). However, the statistical tests used are fairly robust against violations of normality. Degree of skewness for each psychometric test by grade is shown in Table 5.6. Values outside the range of -3 to +3 are a cause for concern.[62] All skewness scores were within the acceptable range in the study sample.

TABLE 5.6. Degree of skewness by grade for psychometric tests

Measure	Grade 4	Grade 8
Eating Attitude Test	2.351	2.301
Children's Depression Inventory	1.767	1.521
Daily Hassles Inventory	2.160	2.439
Family Assessment Device	0.240	-.101

Bar graphs of the distribution of scores for each psychometric test are shown in Figures 5.2 to 5.5. For both Grade 4 and Grade 8 students most of the scores occurred in the low range for the Eating Attitudes Test, Children's Depression Inventory and Daily Hassles Inventory. Scores from the Family Assessment Device, were evenly distributed across score groupings, although most Grade 8 students scored higher than Grade 4 students overall.

Homogeneity of variances

Results of the tests for the equality of group variances for the chronically ill and healthy group are provided in Table 5.7. The Eating and Depress measures in Grade 4 students and the Depress measure in Grade 8 students had unequal group variances.

TABLE 5.7. Results of homogeneity of variance tests for psychometric measures with chronic illness as grouping variable

Measure	Grade	F-value	2-Tail Prob.
Eat	4	3.45	.000
	8	2.10	.077
Depress	4	2.51	.013
	8	2.11	.028
Stress	4	1.15	.612
	8	1.10	.744
Family	4	1.68	.139
	8	1.28	.445

Test means and cutoffs

Means for psychometric test scores and the percent of students scoring above each respective cutoff for the entire sample are given in Table 5.8. Although the psychometric test cutoffs were not intended to be used as a primary analytic tool, comparisons were made with the three measures in which there were defined clinical thresholds. It was found that most students scored within the non-clinical range for all measures. (Breakdown by chronic illness and grade will be given in subsequent sections.)

TABLE 5.8. Mean psychometric test scores and percent of scores above cutoff for entire sample

Test	Mean	% above Cutoff
Eating Attitudes Test	10.50	12.10
Children's Depression Inventory	7.56	6.60
Family Assessment Device	21.05	15.00
Daily Hassles Inventory*		
Junior	3.53	
Senior	3.63	

* No clinical cutoff

5.1.4b Internal consistency

Since all items on a scale are assumed to measure aspects of the same concept, all items should be positively correlated with each other or be internally consistent. Cronbach's Alpha is based on the internal consistency of a test by computing the average correlation between items on a scale with all other items. Its values range from 0 to 1, where higher values indicate a more reliable scale. Table 5.9 shows Cronbach's alpha for the present study and existing literature. All alpha values are moderately high indicating the reliability of scales. Comparison with the existing literature between the scales used in the study showed a similar internal consistency for all the study instruments for each respective grade.

FIGURE 5.2

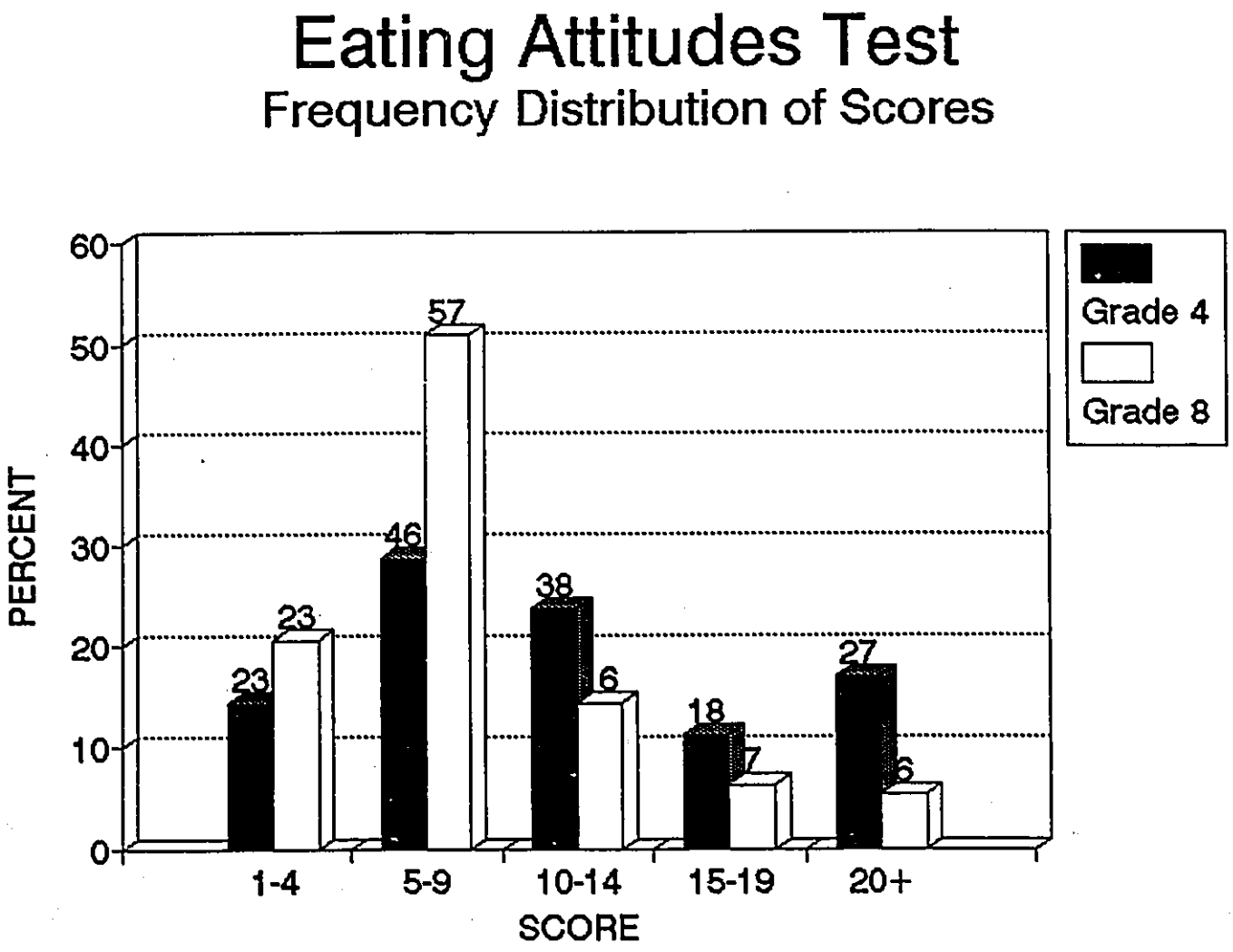

Eating Attitudes Test
Frequency Distribution of Scores
PERCENT
60
50
40
30
20
10
0
23
23
46
57
38
6
18
7
27
6
1-4
5-9
10-14
15-19
20+
SCORE
Grade 4
Grade 8

FIGURE 5.3

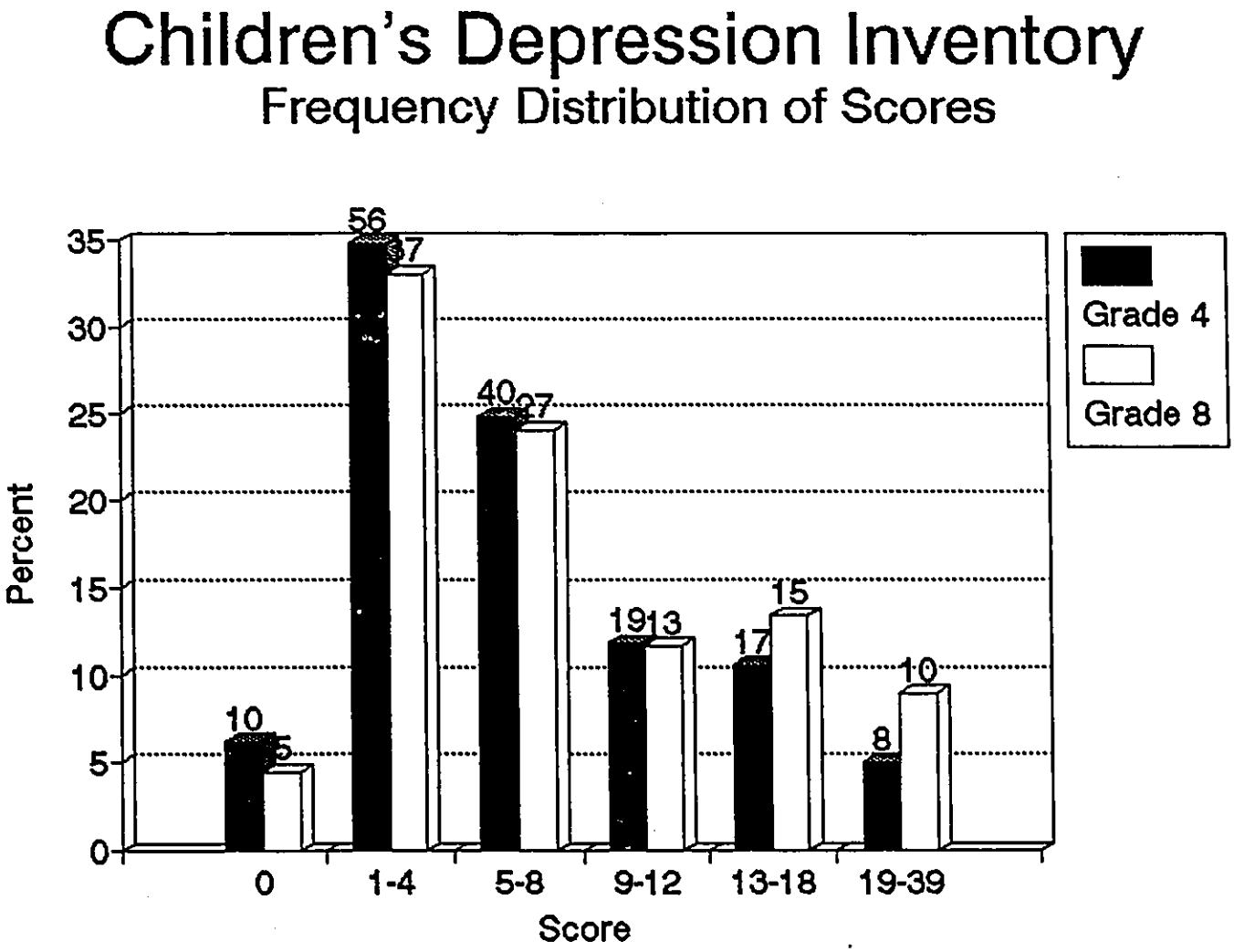

Children's Depression Inventory
Frequency Distribution of Scores
Percent
35
30
25
20
15
10
5
0
56
40
19
13
17
15
10
8
0
1-4
5-8
9-12
13-18
19-39
Score
Grade 4
Grade 8

FIGURE 5.4

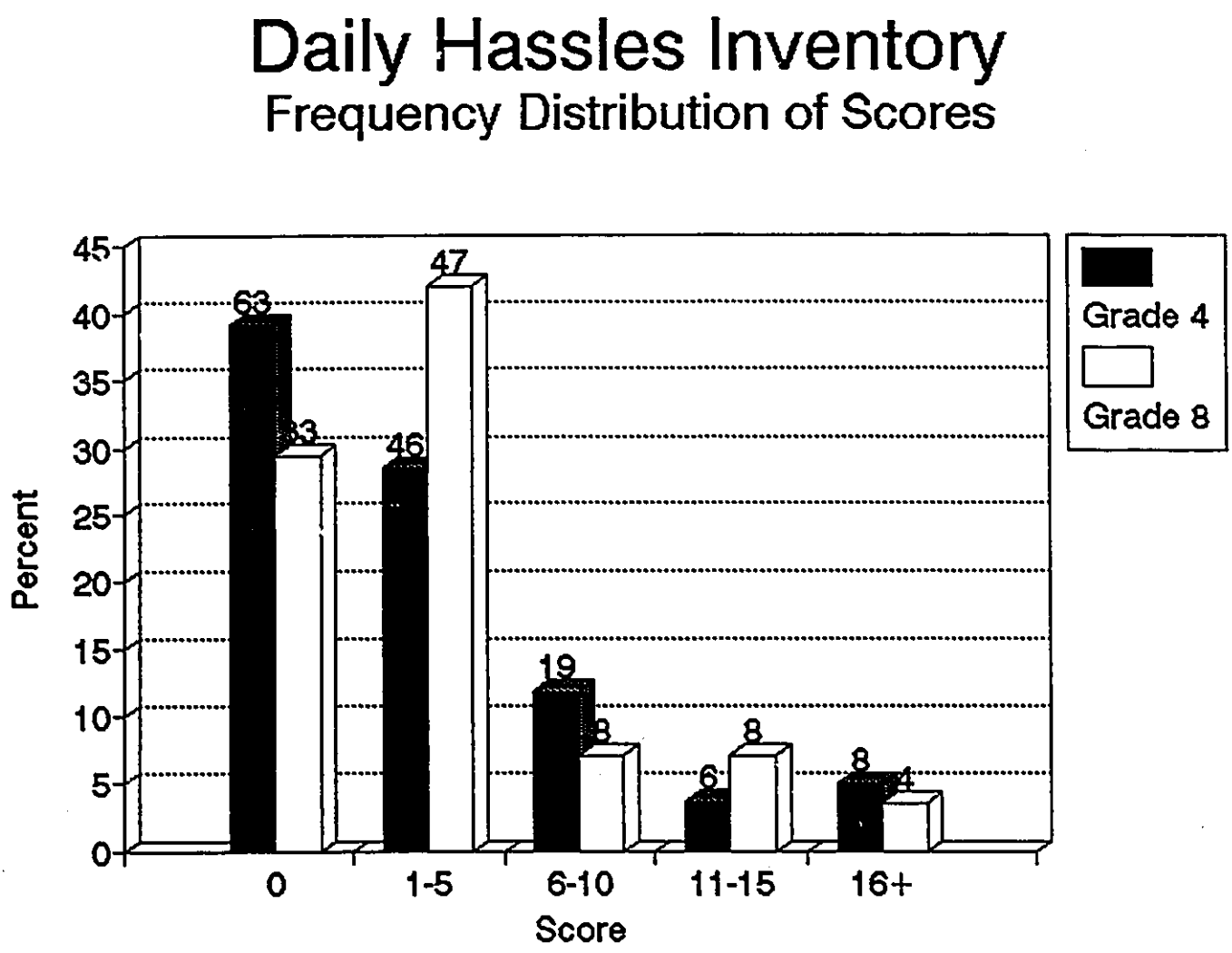

Daily Hassles Inventory
Frequency Distribution of Scores
Percent
45
40
35
30
25
20
15
10
5
0
63
47
46
19
8
6
8
8
4
0
1-5
6-10
11-15
16+
Score
Grade 4
Grade 8

FIGURE 5.5

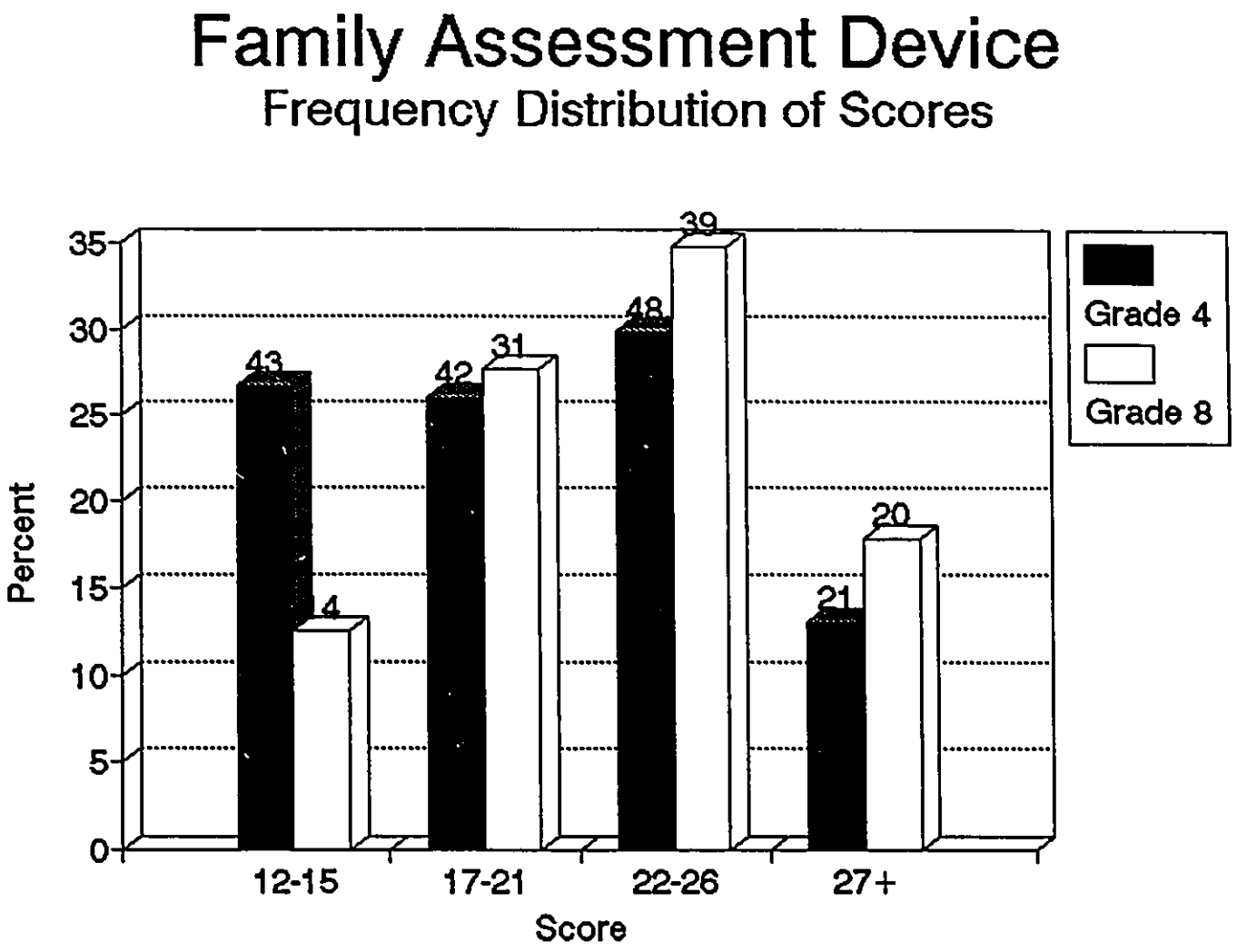

Family Assessment Device
Frequency Distribution of Scores
Percent
35
30
25
20
15
10
5
0
43
14
42
31
48
39
21
20
12-15
17-21
22-26
27+
Score
Grade 4
Grade 8

TABLE 5.9. Cronbach's Alpha of psychometric tests in study and existing literature

	Literature	Study	
		Grade 4	Grade 8
Eating Attitudes Test[60]	.77	.78	.78
Children's Depression Inventory[56]	.87	.88	.89
Daily Hassles Inventory[27]	.83*/.86**	.84	.86
Family Assessment Device[58]	.87	.90	.89

* Grade 4 students
** Grade 8 students

5.1.4c Missing Responses

Table 5.10 lists by grade the total number of cases for which there are individual missing test scores. In all, a total of 43 (26.7%) Grade 4 students and 28 (25%) Grade 8 students had at least one missing test response. Most of the missing responses were from the Daily Hassles Inventories where at least 10% of children had missing data.

TABLE 5.10. Missing test scores by grade

	Grade 4 (n=161)	Grade 8 (n=112)
Eating Attitudes Test	9 (5.6%)	3 (2.7%)
Children's Depression Inventory	11 (6.8%)	5 (4.5%)
Daily Hassles Inventory	19 (11.8%)	12 (10.7%)
Family Assessment Device	7 (4.3%)	8 (7.1%)
Total Students with Missing Scores	43 (26.7%)	28 (25.0%)

5.2 Chronic illness and eating attitudes

5.2.1 Descriptive statistics: Group differences

Mean Eating Attitudes Test (EAT) scores by chronic health status are presented for each grade in Table 5.11. Mean EAT scores were greater for children with chronic illness for both grades with more of an observed difference between Grade 4 EAT scores.

TABLE 5.11. Tests of group differences between chronic illness and Eating Attitudes Test

GRADE	CHRONIC ILLNESS	MEAN	STANDARD DEVIATION	TEST STATISTIC	2-TAIL PROB.
4	Yes	15.24	13.83	U=1377.0	.2512
	No	11.46	7.45		
8	Yes	8.79	4.65	t=.20*	.843
	No	8.47	6.73		

* Pooled Variance Estimate

The percentage of children scoring above the EAT cutoff in each grade is shown below in Table 5.12. Although more Grade 4 children scored above the EAT cutoff than Grade 8 children, the majority of children in each grade scored within the non-clinical range. The odds ratio for scoring above the EAT cutoff if chronically ill was 2.08 (95% confidence intervals: .68 - 6.19) for Grade 4 students and .94 (95% confidence intervals: .02 - 9.22) for Grade 8 students.

TABLE 5.12. Percent of children scoring above the Eating Attitudes Test cutoff, by chronic illness

	CHRONIC ILLNESS			
	YES		NO	
	N	%	N	%
Grade 4	7/25	28.0	20/127	15.7
Grade 8	1/19	5.3	5/90	5.6

5.2.2 Hypothesis 1: Tests of group differences

A t-test was proposed to determine mean Eating Attitudes Test (EAT) differences between study groups, but unequal sample sizes and inequality of group variances for the Grade 4 student scores required the use of a non-parametric test statistic for students in Grade 4. The Mann Whitney U Test tested the hypothesis that the distributions of EAT scores for Grade 4 students would differ significantly between the chronically ill and healthy groups. A higher mean rank score was observed for students with chronic illness, but no significant difference was found between the study group score distributions ($U = 1377.0$, $p = 0.2512$) (Table 5.11).

Although there were unequal sample sizes for the Grade 8 groups, group variances were homogeneous, therefore a pooled variance estimate was used. Mean EAT scores were greater for Grade 8 students with chronic illness. This difference was relatively small and was not statistically significant. The pooled variance estimate of t was .20 ($p = 0.843$) (Table 5.11).

5.2.3 Post-hoc power analysis

Estimation of the actual study power was based on the observed difference of the mean score of the Eating Attitudes Test between children with chronic illness and those who were healthy. An alpha level of 0.05 was assumed. Results of the calculation of study power is given in Table 5.13. Actual power calculations can be found in Appendix F. Since both grades had unequal group sizes of chronically ill and healthy children, an adjusted sample size was generated by using the harmonic mean. Due to the inequality of variances between the mean Eating Attitudes Test scores for the chronically ill and healthy group, an additional adjustment in calculation was made and yielded a modified effect size for Grade 4 students.[59] Observed effect sizes were much smaller than expected effect sizes for both grades (Grade 4= 0.34; Grade 8= 0.04). This also resulted in a lower observed power.

TABLE 5.13. **Actual study power to detect the observed difference in the mean score of the Eating Attitudes Test**

Grade	Adjusted Sample Size	Power
4	45	40%**
8	29	less than 10%

* Cohen's correction for unequal sample size based on a computation of the harmonic mean

** Based on Cohen's correction for unequal variances

5.3 Chronic illness and other psychometric measures

5.3.1 Descriptive statistics: Group differences

Children without chronic illness in Grade 4 had slightly higher mean scores for the other psychometric tests (Table 5.14). The reverse was true for the older students. A greater proportion of children in both grades scored within the non-clinical range for measures of depression and family functioning (Table 5.15). No cutoff scores were used for the stress measures.

TABLE 5.14. Tests of group differences between chronic illness and other psychometric tests

MEASURE	GRADE	CHRONIC ILLNESS	MEAN	STANDARD DEVIATION	TEST STATISTIC	2-TAIL PROB.
Children's Depression Inventory	4	Yes	6.70	4.42	U=1382.5	.506
		No	7.10	6.99		
	8	Yes	11.35	9.94	U=573.5	.102
		No	7.72	6.84		
Daily Hassles Inventory	4	Yes	3.35	5.69	t=-.18*	.861
		No	3.56	5.31		
	8	Yes	4.00	5.70	t=.29*	.769
		No	3.56	5.45		
Family Assessment Device	4	Yes	18.84	4.19	t=-1.68*	.096
		No	20.77	5.44		
	8	Yes	23.11	5.57	t=1.11*	.269
		No	21.68	4.92		

* Pooled Variance Estimate

TABLE 5.15. Percent of children scoring above psychometric test cutoff, by chronic illness

	CHRONIC ILLNESS			
	YES		NO	
	N	%	N	%
Grade 4				
Children's Depression Inventory	0/24	0.0	8/126	6.3
Family Assessment Device	0/25	0.0	21/129	16.3
Grade 8				
Children's Depression Inventory	2/17	11.8	8/90	8.9
Family Assessment Device	7/19	36.8	13/85	15.3

5.3.2 Univariate statistics: Group differences

Tests of group differences by chronic illness were also conducted for the other psychometric variables (Table 5.14). Inequality of variances suggested the use of the Mann Whitney tests to examine differences in distributions with the Children's Depression Inventory. No significant differences were found (Grade 4: U=1382.5: p=.506/Grade 8: U=573.5;p=.102). Pooled variance estimates testing the mean group differences between chronic illness and family functioning and chronic illness and stress also produced insignificant results.

5.3.3 Hypothesis 2: Discriminant analysis

The second study hypothesis was that there would be at least one psychometric test that discriminated between children with chronic illness and children without chronic illness. The discriminant analysis was made up of one dependent variable and four independent variables. Chronic

illness (CHRONIC) was treated as the dependent variable and the independent variables consisted of scores from the four psychometric tests (i.e., Eating Attitudes Test (EATING). Children's Depression Inventory (DEPRESS). Family Assessment Device (FAMILY) and the Daily Hassles Inventories (STRESS)). Inclusion of the EAT variable in the discriminant analysis also allowed for evaluating the impact of other psychometric variables on the relationship between chronic illness and eating attitudes.

A separate discriminant analysis was run for each grade. Bayesian classification analyses were conducted using a priori probabilities of .10 for chronic illness and .90 for no chronic illness based on chronic illness prevalence in the literature.

The discriminant analysis produced univariate and multivariate statistics based on the number of complete cases (i.e., in order to be complete each case had to contain data for all variables).

Similar means in both the chronic and non-chronic groups were found for all psychometric test scores in both grades. This similarity of group means was confirmed by the Wilk's Lambda statistic (transformed to a univariate F statistic) which failed to find a significant difference in psychometric test scores between the chronically ill and healthy group in Grade 4 or Grade 8 students (see Table 5.10).

TABLE 5.16. Group means and Wilk's Lambda statistic

GRADE 4

TEST*	Group 1: Chronic	Group 2: Non-chronic	Wilk's Lambda	P Value
Eating	11.63	11.62	1.000	.9970
Depress	6.34	6.99	0.999	.7328
Family	19.25	20.87	0.989	.2755
Stress	4.38	3.63	0.997	.6240

GRADE 8

TEST*	Group 1: Chronic	Group 2: Non-chronic	Wilk's Lambda	P Value
Eating	9.43	8.10	0.994	.4784
Depress	10.07	7.30	0.978	.1783
Family	23.36	21.79	0.987	.2986
Stress	4.29	3.77	0.998	.7625

The discriminant function results for the psychometric test scores of Grade 4 and Grade 8 students can be found in Table 5.17. The function for Grade 4 students consisted of a single variable, the Family Assessment Device (FAMILY), which was retained despite a non-significant result (chi-square = 1.1892: p = 0.2755) because of the tolerance criteria used. The small eigenvalue and canonical correlation (known as a Pearson correlation in a two-group discriminant function analysis) also proves discrimination was not possible.

Only the variable DEPRESS entered into the discriminant function procedure for Grade 8 students. This function was also non-significant

(chi-square = 1.8121. p =.1783). Again. the eigenvalue and canonical correlation was small indicating that the groups cannot be discriminated.

TABLE 5.17. Stepwise discriminant analysis by grade

Summary by step

Grade 4

STEP	ENTERED	WILKS	SIG.	MAHAL	SIG.
1	FAMILY	.98976	.2755	.08680	.2755

EIGENVALUE	CANON. CORR.	CHI SQUARE	SIG.
0.01035	0.1012	1.1892	.2755

Grade 8

STEP	ENTERED	WILKS	SIG.	MAHAL	SIG.
1	DEPRESS	.97801	.1783	.15802	.1783

EIGENVALUE	CANON. CORR.	CHI SQUARE	SIG.
0.02248	0.1483	1.8121	.1783

Tests of the equality of group covariances were generated by Box's M test. Its significance probability is based on an F transformation where rejection of the null hypothesis would indicate that the covariances are unequal. Group covariances were found to be equal for Grade 4 data, but unequal for Grade 8 data (Appendix K: Box's M Test).

Classification analysis resulted in all children with a chronic illness being classified as healthy in both grades. This yielded a high

"accuracy" or percent of cases correctly classified (due to the large number of children with no chronic illness). The proportion of cases correctly classified as chronically ill (sensitivity) was 0 (Table 5.18). Specificity was obviously 100%.

TABLE 5.18. Discriminant analysis: Classification results

Grade 4

Actual Group	# cases	Predicted Group Membership 1	2
Group 1 Chronic Illness	25	0	25
Group 2 No Chronic Illness	129	0	129

Percent of cases correctly classified: 83.77%

Grade 8

Actual Group	# cases	Predicted Group Membership 1	2
Group 1 Chronic Illness	17	0	17
Group 2 No Chronic Illness	90	0	90

Percent of cases correctly classified: 84.11%

A discriminant function analysis for the two grades combined was run with the independent variables eating, depress, family and age as an additional covariate. Stress was not included in this analysis as a different test existed for each grade. No discrimination was possible in this combined analysis (chi-square = 1.8489; p = 0.1739), thus reinforcing

the null result obtained in the analyses for the individual grades. Classification analysis also yielded similar results.

6. DISCUSSION

6.1 Study design

Since this study was cross-sectional, it was not possible to ascertain cause and effect. The main objective of this study, however, was not to find cause, but to examine the possible association between chronic physical illness and a specific aspect of mental functioning, viz. eating attitudes.

6.2 Quality of the data

Sample representativeness

Only 2 of the 3 administrative areas of the participating school board were recruited into the study. The third area was in Northwestern Quebec and was believed to be too lengthy a distance to travel for data collection. This may have caused a lack of study representation. However, the regions sampled included both rural and urban areas and were considered to be representative of West Quebec students.

This sample did not exhibit a variety of health conditions as anticipated. The mainstreaming movement encourages the enrolment of children with a wide variety of health conditions in regular school classrooms. Not all schools, though, may be able to accommodate children with special needs (e.g., a child with a bleeding disorder). The literature still reports community schools having few children enroled with a specific chronic illness.[31] Inclusion of respondents from institutions other than schools such as hospitals and various special

education programs may have captured a more varied pattern of chronic illness.

Study response

Overall, this study did not achieve a high response rate (51%). Since parents were mailed a questionnaire and were also asked to give consent for their child's study participation at a later date, it may be fair to compare this result to first mailings of postal questionnaires (40%). Community studies, such as this one, cannot be expected to achieve the high response rates of clinical studies which recruit a generally captive group (e.g., inpatients or outpatients visiting an outpatient clinic regularly).[63]

Individual response by school may have produced a bias in study results for Grade 8 students (Appendix G). In one school less than 50% of both parents and students participated in the study. Therefore, the representativeness of responses from older students is especially questionable.

Reasons for unreturned parent questionnaires were obtained in follow-up calls to parents for the purpose of increasing the study response rate. Some students neglected to give the study package (Consent Form and Parent Questionnaire) to their parent, while some parents intended to complete and mail their questionnaire, but forgot. It is also possible that this study was not considered important enough for a parent or their child to volunteer as respondents.

Given the unimpressive study response rate, the application of these findings to similar populations may not be justified. If a

comparison of the respondents versus the nonrespondents was possible then the study's external validity (generalizability) could be properly evaluated. Unfortunately, no information was available on nonrespondents so this comparison could not be made.

A selection bias may exist if the response rate varied for different combinations of chronic illness and eating attitudes. For example, there may have been a 60% response rate for chronically ill children with eating attitude problems compared with a 90% response rate for all other children studied. This variation of study response may have diluted the association between chronic illness and eating attitudes, thus leading to the observed non-significant results.

In some situations, a parent's own dieting history may have influenced whether their child was permitted to participate. A mother who had sent back a consent form refusing her child's involvement in the study explained her own problems with weight, and how she did not want her child to deal with weight issues at that time. This mother sent back a completed Parent Questionnaire, but since her child did not take part in the study it was not possible to use her questionnaire.

Missing values

Missing responses of individual psychometric tests ranged from 3 (2.7%) in the Eating Attitudes Test for Grade 8 students to 19 (11.8%) in the Daily Hassles Inventory for Grade 4 students. Overall these missing responses resulted in missing test scores for at least 25% of students in each grade (Grade 4: 43 (26.7%); Grade 8: 28 (25%)). Respondents who answered most questions may have been different from respondents who chose

not to answer a certain question. As a result overall findings in eating attitudes, depression, stress and family functioning may be unrepresentative of the whole study population.

Limitation of questionnaire

No measurement of duration or severity of chronic illness or limitation of function as a result of the illness was surveyed. If most children suffered from chronic illness for a long time (duration) they may have developed successful coping strategies to deal with the stress of their illness. Severely ill children with a disability may also differ in terms of adjustment from severely ill children without a disability.[2]

Given the results found, it may be that most reported illnesses were of the mild type so did not interfere with a child's functioning. Reports from the literature have suggested that maladjustment is unrelated to the severity of the illness. Severely ill children with a disability, however, may function less well psychosocially than severely ill children without a disability.[2,28]

Misclassification bias

Since there was no association found between chronic illness and eating attitudes, the problem of non-differential classification should be considered.[64] Non-differential misclassification of exposure (chronic illness) occurs when the proportions of incorrect responses are the same for both outcomes (children scoring above and below the cutoff on the Eating Attitudes Test). This may lead to an underestimation of the true effect.

The prevalence of chronic illness observed in this study (17.2%) is higher than in other studies.[10] Therefore, it is not likely that a high proportion of children classified as healthy were chronically ill (although a high proportion of non-responders could have been healthy). There was no certain way to confirm reports of chronic illness or no chronic illness unless there was a hospital chart or other medical evidence for every child studied. The validation study (see results section) has already demonstrated this reality.

Differential misclassification may also have been possible with respect to either exposure or disease status. This occurs when the proportion of incorrect data differs in the study groups. If only 10% of the reports of chronic illness are true among children with high Eat scores, compared to 80% among children with low EAT scores, then misclassification of exposure has occurred. Differential misclassification can bias the observed result either towards the null or away from it.

The situations described above are plausible in this study. As pointed out, however, there was a lack of medical evidence for a majority of chronic illness reports. There was also no certain way of confirming the authenticity of responses on the EAT. While a small proportion of children were interviewed as part of the larger project in order to confirm EAT responses, this study only used the survey component.

Confounding

No attempt was made to methodologically or statistically control for the influence of demographic variables on the relationship

hypothesized. A preliminary analysis found that chronically ill children did not differ significantly from healthy children in demographic characteristics such as family status and gender in either grade. A recent substudy of the Ontario Child Health Study found similar results.[58,65] Therefore, it can be assumed that family status and gender did not confound the observations in this study.

No association was found in comparing socioeconomic status (SES) of chronically ill children with healthy children in either grade. This lack of association may be attributed to the study's small sample size. When examining families on several demographic characteristics, however, the Ontario Child Health Study (OCHS) found more low income families more likely to have a chronically ill child. No information on income was collected in the database used, therefore, no comparison of SES using income was possible.

6.3 Descriptive results

Chronic illness survey question

Reports of chronic illness by questionnaire for both grades was 15%, similar to the recent Ontario Child Health Study (14%).[2] As in other surveys asthma was the most prevalent chronic condition for both Grade 4 and Grade 8. Other than hearing and speech impairment, no other chronic illness was reported by parents.

Since the study population was small in comparison with large population based surveys such as the Ontario Child Health Study (OCHS), the pattern of chronic illness would not be expected to be the same. With the exception of asthma, most chronic illnesses are rare with many

conditions of low incidence (1-5 per 1000) making up an overall prevalence of 10-20%.

Validation study of reported chronic illness

Only 13 reports of chronic illness were confirmed by hospital charts at the Children's Hospital of Eastern Ontario (CHEO). Although agreement (accuracy) of the hospital charts and survey reports was calculated to be 0.87 or 87 percent. correction for chance agreement yielded a moderate Kappa of 0.46 or 46 percent.[66]

There are several reasons for the moderate concordance found between parental reports of chronic illness and CHEO hospital charts.

In the past most children from West Quebec needing medical attention were referred to CHEO. Improvements in Quebec health care since 1991. however. have led to a decrease in the use of services from Ontario. Consequently. children requiring care may not have been taken to CHEO. but instead to a hospital in Quebec. As a result there may have been no record of a child's medical condition at CHEO.

Disease severity may have also affected the small number of confirmed illnesses. Unless a condition was severe enough to require special attention at a tertiary care center (e.g.. cerebral palsy. diabetes. spina bifida). parents from West Quebec may have sought medical care for their child with a local family physician or specialist. Treatment by these physicians may never have involved a referral to a hospital in either Quebec or Ontario.

The chart review identified 6 children with a chronic illness not previously reported by a parent in the questionnaire. This finding implies that the parental reports may not be valid.

As a validation tool the medical charts at CHEO did not serve well as a gold standard. Other possible sources of validation such as Quebec hospitals and physicians or subspecialists in private practice used in conjunction with CHEO records may have yielded different (and more satisfactory) results.

Psychometric tests

An acceptable internal consistency was achieved for each psychometric test. Strikingly similar results were found in the literature (Table 5.9).

None of the psychometric test score distributions was normally distributed, resembling instead positively skewed distributions, with the exception of the Family Assessment Device. The shapes of these distributions are characteristic of other studies with general populations where the majority of individual scores lie within the nonclinical part of the distribution.[27,56,58,67]

6.4 Statistical analyses

Objective 1: Determining the association between chronic illness and eating attitudes

The first objective of this study was to determine if there was any score difference on the Eating Attitudes Test (EAT) between children with chronic illness and children without chronic illness. Both Grade 4 and Grade 8 children with chronic illness were not found to have significantly

different scores than their healthy counterparts. Thus the hypothesis was not fulfilled.

This study did not uncover a diagnostically heterogeneous sample of chronically ill children. The results found may be comparable only to studies of asthma and eating attitudes. however. there are no studies in this area. Disturbed eating was associated with poor control of glycemia in diabetic patients.[48] Significant eating disturbances were found in cystic fibrosis patients aged 8 -15 years. such as resisting food and being preoccupied with food.[46,48] Therefore. the lack of association found between chronic illness and the EAT score in the present study may be attributed to disease-specific effects associated with mental functioning: other diseases (not found in our sample) may have had a larger effect on this hypothesized association.

There are other reasons which may account for the lack of association in this study which may have little to do with the literature.

Violations of statistical assumptions

Violations of statistical assumptions for the t-test were apparent in both grade groups. The frequency distributions of the EAT were skewed in the positive direction for both grades. A t-test. however. is quite robust against violations of normality.[61,68] This is especially true if a two-tailed test is used rather than a one-tailed t-test. Since a non-directional test was used. it can be assumed that the robustness of the test was satisfied.

A more serious violation of a parametric test is the homogeneity of variance assumption where there are unequal variances between the study

groups. This violation was apparent in the EAT variance for the Grade 4 students' scores. An an adjusted t-test would have been appropriate, but the added violation of normality along with unequal sample sizes required a more suitable test. Therefore the Mann Whitney Test, a non-parametric statistic, was employed.

Study power

Sample size and its relation to study power may best explain the lack of association found between chronic illness and eating attitudes. A small difference in EAT scores was found between children with chronic illness and children without chronic illness, rather than the moderate difference hypothesized prior to data analysis (6.9). This resulted in an observed power (based on mean EAT scores) much lower than what was expected for both grades (Grade 4: expected = 75%, observed = 40%; Grade 8: expected = 59%, observed = less than 10%). If the sample size or the difference in mean EAT scores had been much larger than what was observed, the study results may have been different.

Limitations of interpreting adjusted study power

While power calculations were adjusted for unequal sample sizes for both grades, an additional adjustment in calculations was made to account for unequal variances in Grade 4 EAT scores. Adjusting for unequal sample sizes and unequal variances may have resulted in an observed power much different from its true value.[59]

Objective 2: Determining the influence of other psychometric test scores on the Eating Attitudes Test

The second objective of this study was to determine if there was a meaningful group difference in other psychometric test scores of depression, family functioning and stress. Grade 4 and Grade 8 children with chronic illness were not found to differ from children without chronic illness on any psychometric test score. Thus, the hypothesized discrimination between groups was not fulfilled.

The influence of other psychometric variables between chronic illness and eating attitudes was evaluated simultaneously by including the EAT variable in the discriminant analysis. Since none of the other psychometric tests discriminated between the study groups, it follows that these variables did not seem to influence the relationship between chronic illness and eating attitudes.

The fact that discrimination was not possible suggests an examination of the statistical assumption surrounding this test. There are two major assumptions of a linear discriminant analysis. The first assumption is that the independent variables used in the discriminant function should have a multivariate normal distribution. Descriptive statistics previously reported (see Figures 5.2 - 5.5, section 5.4) showed that these variables were not normally distributed.

The second major assumption is that the groups (chronic illness and no chronic illness) should have a similar within group variance-covariance structure (or that the group variances are equal). This assumption was met for Grade 4, but not Grade 8 (Grade 4: $p=0.3622$; Grade 8: $p=0.0307$). In this latter group, Box's M test was significant, leading to the rejection of the null hypothesis of equal covariances among the variables.

This result may have invalidated the discriminant analysis for the Grade 8 group.

Other factors may have affected the discriminant analysis results. No calculation of study power based on a discriminant analysis was generated. The subject-variable ratio guideline, however, may be an alternative method of judging the adequacy of sample size. The subject-variable ratio guideline in a discriminant function analysis requires that there should be 10 subjects per study group for every dependent variable in the analysis. Since there were four independent variables in the present discriminant function, a minimum of 40 subjects per group was required.

Neither of the study groups had an adequate subject variable ratio in the chronically ill group (i.e., less than 40 subjects). Both the Grade 4 and the Grade 8 data contained missing responses. Discriminant function analysis only includes a case for analysis if there are data available for all the dependent variables. Therefore, if one psychometric test score was missing out of the four required for analysis, that case was not included. Out of 161 cases available for Grade 4 data only 118 cases were used in the discriminant function. Similarly, out of 112 cases available for Grade 8 data only 84 cases were analyzed, but when the two grades were combined the subject-variable ratio guideline was met and the overall results were no different.

More similarities than differences were found between the study groups in each grade. This was demonstrated in the classification analysis where no discrimination was made between group scores of chronically ill and healthy children. Therefore, the variables used in

the discriminant function may not have been appropriate for this study population.

6.5 Conclusions

This study did not find any statistically significant association between chronic illness and eating attitudes nor between chronic illness and depression, family functioning or stress. Although this lack of difference may reflect reality, it is not possible to make valid conclusions based on this study given the problems with data quality and validity, especially with regard to the poor sample size and power.

Since this study was a secondary analysis of data, data quality related to areas such as sample representativeness, study response and missing data was not directly influenceable by the the writer of this thesis. This secondary analysis, however, tested hypotheses not addressed in the original Children's Food and Mood Study. It is unique in that a specific psychiatric syndrome, such as anorexia nervosa, via the risk factor of abnormal eating attitudes, was investigated. The majority of studies evaluating mental health in chronically ill children have instead measured general functioning.

All children with chronic illness may not be susceptible to an eating disorder. However, the physical consequences of a syndrome such as anorexia nervosa may be severe enough to complicate an already serious disease sometimes with irreversible long-term effects. If there is a way to prevent the full manifestation of an eating disorder by becoming aware of the early signs of eating disturbance then studying abnormal eating attitudes in chronically ill children is justified.

6.6 Recommendations for further research

Research of chronic childhood illness and its relation to mental health and adjustment is plagued with many problems. Most studies in this area are from clinical investigations.[2] Their methodologies are often weak and there has been continuing disagreement about the frequency and specific nature of reported mental health problems.[1,30] Many recent investigations (including the Ontario Child Health Study) attempting to correct these past inadequacies have been conducted on a relatively large scale with sufficient financial resources.

This study lacked the appropriate financial resources and time needed to replicate the results of large population based surveys. Given this limitation, the following recommendations, based on problems addressed in the discussion section of this paper, could improve a smaller survey such as this one, without sacrificing study quality.

1. Attempt to increase study response by mailing parents the Parent Questionnaire and the Consent Form for their child's participation instead of sending the test package home with the child. Consider mailing the packages a second time to those parents who did not send back their questionnaires or the parental consent form.

2. When asking parents about a chronic illness that their child suffers from, include questions about duration of illness, restriction of activity and utilization (e.g., how many times a year do they visit hospitals for treatment, emergency room

visits, hospital admissions). In this way, comparisons can be made with other studies of chronic illness and mental health and adjustment which asked about physical limitation of activity and utilization of health care services (e.g., Ontario Child Health Study).

3. Validate parental reports of chronic illness by using multiple means of verification besides hospital charts (e.g., school medical records, family physician records).

4. Consider the possibility of conducting a case-control study in order to improve upon the statistical efficiency of the study.

5. Survey institutions in addition to schools when assessing the pattern of chronic childhood illness in the community.

6. Recruit a larger sample of children and parents so that power will be sufficient to detect a moderate association between chronic illness and mental health and adjustment.

7. Collect information on demographic data and chronic health status in order to compare characteristics of respondents with non-respondents.

8. Devise a way of maintaining the completeness of responses for an individual case so that that it will not be sacrificed in data analysis.

REFERENCES

1. Pless IB, Nolan T. Revision, replication and neglect - research on maladjustment in chronic illness. J Child Psychiat 1991.32:347-365.

2. Cadman D, Boyle M, Szatmari P, Offord DR: Chronic illness, disability, and mental and social well-being: Findings of the Ontario Child Health Study. Pediatrics 1987. 79:805-813.

3. Drotar D, Doershuk CF, Stern RC, Boat TF, Boyer W, Matthews L. Psychosocial functioning of children with cystic fibrosis. Pediatrics 1981;67:338-343.

4. Breslau N. Psychiatric disorder in children with disabilities. Am Acad Child Psychiatry 1985;24:87-94.

5. Button EJ, Whitehouse A. Subclinical anorexia nervosa.Psychol Med 1981;11:509-516.

6. Pless IB, Pinkerton P. Chronic Childhood disorders: Promoting patterns of adjustment. London: Henry Kimpton.1975: 90-91.

7. Stein REK, Jessop DJ: Relationship between health status and psychological adjustment among children with chronic conditions. Pediatrics 1984;73:169-174.

8. Green, M. The management of long-term nonlife-threatening illnesses. In: M. Green & RS Haggerty (eds): Ambulatory Pediatrics 1965. Philadelphia: WB Saunders.

9. Pless IB, Roghmann KJ. Chronic illness and its consequences: Observations based on three epidemiologic surveys. Pediatrics 1971;79:351-359.

10. Cadman D, Boyle M, Offord DR, Szatmari P, Rae-Grant NI, Crawford J, Byles J. Chronic illness and functional limitation in Ontario children: findings of the Ontario Child Health Study. Can Med Assoc J 1986;135:761-767.

11. Newacheck PW, Taylor WR. Childhood chronic illness: prevalence, severity, and impact. Am J Public Health 1992:82-364-371.

12. Stein REK. Introduction. In REK Stein (ed): Caring for Children with Chronic Illness: Issues and strategies 1989: New York, pp. xxiii-xxx.

13. Gortmaker SL, Sappenfield W. Chronic childhood disorders: prevalence and impact. Pediatr Clin North Am 1984:31:3-18.

14. Rutter M, Tizard J, Whitmore K. Education, Health and Behavior. London, 1970: Longmans, Green and Co.

15. Roghmann KJ. Haggerty RJ. Rochester Child Health Surveys: I Objectives. organization and methods. Med Care 1970:8:47.

16. Pless IB. Wadsworth MEJ. Long-term effects of chronic illness on young adults. In REK Stein: Caring for Children with Chronic Illness: Issues and Strategies. New York:Springer 1989: 147-158.

17. O'Malley JE. Koocher G. Foster D. Slavin L. Psychiatric sequelae of surviving childhood cancer. Am J Orthopsychiatry 1979:49:608-616.

18. Fine RN. Malezadeh MH. Pennisi AJ. Ettenger RB. Wittenbogaart CH. Aegrete VF. Korsch BM. Long term results of renal transplantation in children. Pediatrics 1978:61:641-651.

19. Johnson S. Psychosocial factors in juvenile diabetes: A review. J Behav Med 1980:3:95-115.

20. Mrazek D. Anderson I. Strunk R. Disturbed emotional development of severely asthmatic pre-school children. In J.E. Stevenson (Ed): Recent research in developmental psychopathlogy (pp.81-93) 1985. Oxford:Pergamon.

21. Billings AG. Moos RH. Miller JJ. Gottlieb JE. Psychosocial adaptation in juvenile rheumatic disease: A controlled evaluation. Health Psychology 1987;6:343-359.

22. Garralda ME. Jameson RA. Reynolds JM. Postlethwaite JR. Psychiatric adjustment in children with chronic renal failure. Journal of Child Psychology and Psychiatry 1988;29:79-90.

23. Worchel FF. Nolan BF. Willson VL. Purser JS. Copeland D. Pfefferbaum B. Assessment of depression in children with cancer. Journal of Pediatric Psychology 1988;13:101-112.

24. Sabbeth B. Understanding the impact of chronic childhood illness on families. Pediatr Clin North Am 1984;31:47-57.

25. Gislason IL. Eating disorders in childhood (ages 4 through 11). In BJ Blinder and R Goldstein (eds): The Eating Disorders. New York:PMA. 1988:285-293.

26. Bedell JR. Giordani B. Amour JL. Tavormina J. Boll T. Life stress and the psychological and medical adjustment of chronically ill children. Journal of Psychosomatic Research 1977;21:237-242.

27. Elwood SW. Stressor and coping response inventories for children. Psychol Rep 1987;60:931-947.

28. Bruhn JG. Hampton JW. Chandler BC. Clinical marginality and psychological adjustment in hemophilia. J Psychosom Res 1971;207-213.

29. McAnarney ER. Pless IB. Satterwhite B. Friedman SB. Psychological problems of children with chronic juvenile arthritis. Pediatrics 1974: 53:523-528.

30. Pless IB. Clinical assessment: physical and psychological functioning. Pediatr Clin North Am 1984;31:33-45.

31. Pless IB. Perrin JM. Issues common to a variety of illnesses. In: Issues in the care of children with a chronic illness. Perrin & Hobbs eds. 1985.p.41-60.

32. Stein RE. Jessop DJ. A noncategorical approach to chronic childhood illness. Public Health Rep 1982;97:354-362.

33. World Health Organization. International classification of impairments, disabilities, and handicaps 1980: pp.24. Geneva.

34. Silverman MM. Koretz DS. Preventing mental health problems. In REK Stein (ed). Caring for Children with Chronic Illness: Issues and Strategies. New York: Springer. 1989:213-229.

35. Leichner P. Gertler A. Prevalence and incidence studies of anorexia nervosa. In: BJ Blinder. Bf Chatin. & R Goldstein (eds). The Eating Disorders. New York: PMA. 1988:131-149.

36. Feldman W. Feldman E. Goodman JT. Culture versus biology: Children's attitudes toward thinness and fatness. Pediatrics 1988;81:190-194.

37. Fries H. Secondary amenorrhoea. self-induced weight reduction and anorexia nervosa. Acta Psychiatrica Scand 1974; Suppl 248.

38. Garner DM. Garfinkel PE. The Eating Attitudes Test: An index of the symptoms of anorexia nervosa. Psychol Med 1979;9:273-279.

39. Mann AH. Wakeling A. Wood K. Monck E. Dobbs R. Szmuckler G. Screening for abnormal eating attitudes and psychiatric morbidity in an unselected population of 15 year old schoolgirls. Psychol Med 1983;13:573-580.

40. Herzog DB. Copeland PM. Eating disorders. N Engl J Med 1985;313:295-303.

41. Johnson-Sabine E. Wood K. Patton G. Mann A. Wakeling A.Abnormal eating attitudes in London schoolgirls - a prospective epidemiological study: factors associated with abnormal response on screening questionnaires. Psychol Med 1988;18:615-622.

42. Nylander I. The feeling of being fat and dieting in a school population: An epidemiologic interview investigation. Acta Sociomedia Scand 1971: 1:17-26.

43. Patton GC. Johnson-Sabine E. Wood K. Mann AH. Wakeling A. Abnormal eating attitudes in London schoolgirls - a prospective epidemiological study: outcome at twelve month follow-up. Psychol Med 1990:20:383-394.

44. Dwyer JT. Feldman JJ. Mayer J. Adolescent dieters: Who are they? Am J Clin Nutr 1967:20:1045-1056.

45. Steel JM. Young RJ. Lloyd GG. Clarke BF. Clinically apparent eating disorders in young diabetic women: associations with painful neuropathy and other complications. Br Med J 1987:294:859-862.

46. Pearson DA. Pumariega AJ. Seilheimer DK. The development of psychiatric symptomatology in patients with cystic fibrosis. J Am Acad Child Adolesc Psychiatry 1991: 30:290-297.

47. Gleason RE. Epidemiology of Insulin-Dependent Diabetes Mellitus. In: Pediatric and Adolescent Diabetes Mellitus.Stuart J. Brink. ed. Year Book Medical Publishers. 1987:153-163.

48. Fairburn CG. Peveler RC. Davies B. Mann JI. Mayou RA. Eating disorders in young adults with insulin dependent diabetes mellitus: a controlled study. Brit Med J 1991;303:17-20.

49. Irwin M. Early onset of anorexia nervosa. South Med J 1984;77:5.

50. Alessi NE. Krahn D. Brehm D. Wittekindt J. Prepubertal anorexia nervosa and major depressive disorder. J Am Acad Child Adolesc Psychiatry 1989;28:380-384.

51. Herzog DB. Are anorexic and bulimic patients depressed?. Am J Psychiatry 1984; 141:1594-7.

52. Swift WJ. Andrews D. Barklage NE. The relationship between affective disorder and eating disorders: A review of the literature. Am J Psychiatry 1986;143:290-299.

53. Blishen BR. McRoberts HA. A revised socioeconomic index for occupations in Canada. Canad Rev Soc Antr 1976;13:71-73.

54. Gearheart. BR. Weishahn MW: The handicapped child in the regular classroom. The C. V. Mosby Co.. 1976.

55. Vacc NA. Rhyne M. The Eating Attitudes Test: Development of an adapted language form for children. Percept Mot Skills. 1987;65:335-336.

56. Rhyne Winkler. Martha 1988. Eating attitudes in fourth. sixth and eighth grade females. Doctoral dissertation: University of North Carolina. Cited in Dr. DiNicola's grant application for the Children's Food and Mood Study.

57. Kovacs M. The Children's Depression Inventory: A self-rated depression scale for children. Unpublished manuscript: University of Pittsburgh. Pittsburgh. PA:1-40.

58. Epstein NB. Baldwin LM. Bishop DS. The McMaster Family Assessment Device. J Marital Fam Ther 1983: 9:171-180.

59. Byles J, Byrne C, Boyle MH, Offord DR. Ontario Child Health Study: Reliability and validity of the General Functioning Subscale of the McMaster Family Assessment Device. Fam Process 1988; 27:97-104.

60. Cohen, J. Statistical power analysis for the behavioral sciences: Second Edition. Lawrence Erlbaum Associates, 1988: 1-17, 19-74.

61. Garner DM, Olmsted MP, Bohr Y, Garfinkel PE. The eating attitudes test: psychometric features and clinical correlates. Psychol Med 1982; 12:871-878.

62. Glassnapp DR, Poggio JP. Measures of variability. In: Essential of Statistical Analysis for the Behavioral Sciences. Ohio: Merrill, 1985:125.

63. Moser CA, Kalton G. Survey Methods in Social Investigation 1979; London:Heinemann.

64. Rothman KL. Objectives of epidemiologic study design. In: Modern Epidemiology. Little, Brown & Co.,1986:77-97.

65. Cadman D, Rosenbaum P, Boyle M, Offord D. Children with chronic illness: Family and parent characteristics and psychosocial adjustment. Pediatrics 1991;6:884-889.

66. Sackett DL, Haynes RB, Guyatt GH, Tugwell P. Clinical Epidemiology: a basic science for clinical medicine, 2nd edition. Boston: Little, Brown, 1985. p.30

67. Maloney MJ, McGuire J, Daniels SR, Specker B. Dieting behavior and eating attitudes in children. Pediatrics 1989;84:482-489.

68. Ferguson GA. Statistical Analysis in Psychology and Education. McGraw-Hill, 1976:166-170.

UNIVERSITÉ D'OTTAWA
UNIVERSITY OF OTTAWA

FACULTÉ DE MÉDECINE
FACULTY OF MEDICINE

CONSENT FORM FOR PARENTS AND GUARDIANS

Vincenzo F. DiNicola, M.D.
Project Director
(613) 722-6521, ext. 6275

Louise Oke, B.A.
Research Assistant
(613) 722-6521, ext. 6651

Dear Parent or Guardian:

A project concerned with eating attitudes in children is being conducted by researchers from the University of Ottawa. At their June 1991 meeting the Eastern Quebec Protestant Regional School Board agreed to participate in the Children's Food and Mood Study.

The purpose of the research is to learn more about children's attitudes and feelings about eating. Some children are worried about eating because they feel too fat or too thin or that they cannot control their appetite. We want to determine how many children and their parents have concerns about eating and their weight. We also want to study some of the reasons why children have eating problems.

This is a study of children and their families; all the children in your child's class will be asked to participate. To help us in this study, we need the participation of you and your child.

Participation in this study will involve:

1. Your permission on the form attached.

2. Your child filling out three short questionnaires in one class period. These questionnaires are about:
   a) eating attitudes,
   b) moods and feelings,
   c) hassles and major events experienced by your child.

   The three questionnaires take about 30 minutes to complete. They will be given by a research assistant trained to work with children and to answer their questions.

   We know that children enjoy taking part in sessions like this when they are asked to give their opinions about important questions like health. Participation in the session may also have educational value for children by increasing their awareness of the importance of their health and well-being.

PSYCHIATRIE/PSYCHIATRY
HÔPITAL ROYAL OTTAWA/ROYAL OTTAWA HOSPITAL
1145 CARLING, OTTAWA, ONTARIO, CANADA K1Z 7K4
(613) 724-6546

3. Your child having his/her height and weight taken in private during the session.

4. Your filling out the enclosed Parent Questionnaire about your child's background and family, and a checklist on your child's behaviour. We ask that you fill it out in private at home. We are interested in learning about your child's experiences, ethnic, cultural and religious background. Because of this, some of the questions on the Parent Questionnaire are personal. You need not answer any question if you do not want to. It takes about 45 minutes of your time. Send it back to us sealed in the stamped envelope provided. Your child may still participate whether or not you wish to complete the Parent Questionnaire.

5. Some parents will be contacted to request their participation in the second stage of the study. If from our analysis of your child's responses we judge that your son or daughter may be having problems, we shall write to you to arrange a meeting to discuss them. Most children will reveal no evidence of a problem but we shall want to interview a few of these families as well in order to provide a comparison group. So we may write you again to request your continued participation in the second stage of the study. Participation in this second stage is voluntary. Participation in Stage One does not oblige you to participate in Stage Two.

All the responses from you and your child will be totally confidential and no one will be told about individual responses because we are interested in understanding children as a group. This information will not be recorded in any school records and will be seen only by the researchers involved in this study.

We would be grateful for your cooperation. This is a voluntary project and only students with written permission can participate. As mentioned, your child may still participate whether or not you wish to complete the Parent Questionnaire and he or she may stop at any time during the session. Whether or not you wish to participate:

* please complete the attached consent form and return it to the school with your child within the next week.

We hope you will agree to help us in this project so that we can learn more about children's attitudes to eating and their bodies to understand the children who develop problems with their eating habits.

If you have any questions or concerns, please contact us by calling Louise Oke or Dr. DiNicola at 722-6521, ext 6275. Thank you for your co-operation.

Yours sincerely,

Vincenzo F. DiNicola

Vincenzo F. DiNicola, M.D.

CONSENT FORM: CHILDREN'S FOOD AND MOOD STUDY

I have read and understood the request for my child to participate in the Children's Food and Mood Study.

_____ I hereby give permission for my child to participate.
_____ I do not give permission for my child to participate.

NAME OF CHILD: _____ DATE: _____

SIGNATURE OF PARENT OR GUARDIAN: _____

Please fill in the following only if you have given permission for your child to participate.

How old is your child? ____ years old

What is the sex of your child? _____ girl _____ boy

What grade is your child in? _____ grade

Home Address: _____

City: _____ Postal Code: _____

Home Telephone Number: _____

PLEASE RETURN THIS FORM TO SCHOOL WITH YOUR CHILD.

Children's Food and Mood Study
Royal Ottawa Hospital
1145 Carling Avenue
Ottawa, Ontario
K1Z 7K4

General Instructions

These short questionnaires ask about feelings, daily events and behaviour, including eating habits, in young people your age. They should take no more than 45 minutes to fill out. Before starting, please note the following:

Please print your name on the line below:

Your Name (Print)_____

Do not put your name anywhere else on the questionnaires.

* Your replies on this questionnaire are entirely confidential.
* Your replies on this questionnaire will not affect your grades in any class.
* Answer quickly with the first response that comes to mind; don't think too long about any one question.
* This is not a test. There are no right or wrong answers.
* If you don't understand a question, answer what it means to you.
* If you can't decide how to answer a question, give your best guess.
* If you object to a question, you need not answer it. You may stop your participation at any time.

THIS PAGE WILL BE COLLECTED SEPARATELY AND KEPT SEPARATELY FROM THE QUESTIONNAIRES

Thank you very much. All the information will be kept private so you can answer in the most accurate way.

CHILDREN'S FOOD AND MOOD STUDY

UNIVERSITY OF OTTAWA, SCHOOL OF MEDICINE, 1145 CARLING AVENUE, OTTAWA, K1Z 7K4
(613) 722-6521, EXT. 6275

PARENT QUESTIONNAIRE

INSTRUCTIONS

* The Children's Food and Mood Study has two parts:
  1) Your child will answer questions about his/her eating attitudes in class.
  2) We would like a parent to answer questions about your child's background and family, and to fill out a checklist of your child's behaviour, in this parent questionnaire.
* The Parent Questionnaire should be completed by one parent or guardian. It takes about 45 minutes to complete.
* Your replies on this questionnaire are confidential. It should be returned by sealing it in the self-addressed, stamped envelope provided and mailing it directly to us. The school will not see your replies. The questionnaire is number-coded to match this instruction page and the consent form which identify you by name. We need this identification in order to match parent and child questionnaires. Once this matching is done, consent forms and cover pages will be stored separately from the questionnaires and names will be used in order to reach you should our analysis suggest that your child may have a problem or should we wish to interview you are part of a small sample of children who appear to be functioning satisfactorily. For this reason we also need your address on the consent form.
* If you're not sure about a question, answer what it means to you.
* If you object to a question, you need not answer it.
* With your written consent your child may take part in the study even if you decide not to answer this questionnaire.

"PARENT" REFERS TO ANY PARENT OR GUARDIAN LIVING WITH THE CHILD.

"CHILD" REFERS TO THE STUDENT WHO HAS BEEN ASKED TO PARTICIPATE IN THIS STUDY.

WHO IS ANSWERING THIS?

Relationship to Child: _____

Your Name (Optional): _____

Your Child's Name: _____

PARENT QUESTIONNAIRE

PLEASE FILL IN THE BLANKS OR PUT A CHECK (✓) BESIDE THE ANSWER WHICH BEST DESCRIBES YOU.

FAMILY

1. How many children are in the child's family?_____
2. Ages (from oldest to youngest)_____ _____ _____ _____ _____
3. Circle the age of the child who is part of this study.
4. What is your child's birthdate?
   month _____ day _____ year 19 _____
5. This child is a: _____ girl _____ boy
6. Is the child adopted? _____ no _____ yes
7. If the child's parents (biological or adoptive) are separated or divorced, how old was the child when they first separated?
   _____ years old

****

The child's present living situation and involvement with parents and/or guardians: Check as many as apply.

	living with full-time	living with part-time	sees occasionally	N/A
8. Biological mother				
9. Biological father				
10. Adoptive mother				
11. Adoptive father				
12. Step-mother				
13. Step-father				
14. Foster mother				
15. Foster father				
16. Group home Guardian(s)				
17. Other adult(s) in the home please specify:				

FAMILY AND CULTURAL BACKGROUND

* Illnesses are experienced in many different ways around the world. Some illnesses are more common in some places than in others. Eating disorders occur more frequently in Western societies and under conditions of rapid social change. For this reason, the following questions about your child's ethnic, cultural and religious background have been included in order to understand the link between disorders and social background. Remember that you need not answer a question if you don't want to.

* Please answer questions about the "parents" (whether biological, adoptive, foster, or guardian) who have raised the child for the longest period of time.

18. What is your child's mother's occupation?

_____

19. What is your child's father's occupation?

_____

20. Where was your child's mother born?

_____ in Ontario

_____ in another province. Which province? _____

_____ in another country. Which country? _____

_____ I am not sure

21. Where was your child's father born?

_____ in Ontario

_____ in another province. Which province? _____

_____ in another country. Which country? _____

_____ I am not sure

22. Where was your child born?

_____ in Ontario

_____ in another province. Which province? _____

_____ in another country. Which country? _____

_____ I am not sure

23. If your child was born outside of Canada, how old was he/she when he/she moved to Canada?

_____ years old

24. How many times has your child moved in his/her lifetime?

_____ times

* Remember that you need not answer a question if you don't want to.

25. What religious tradition(s) has your child been raised with? Check as many as apply:

_____ Buddhist

_____ Christian _____ Protestant
_____ Roman Catholic
_____ Other _____

_____ Hindu

_____ Jewish

_____ Moslem

_____ Native Peoples' Religion

_____ Non-religious

_____ Sikh

_____ Other: _____

26. To which ethnic or cultural group(s) do your child's ancestors belong?

_____ French

_____ English

_____ Irish

_____ Scottish

_____ German

_____ Italian

_____ Ukrainian

_____ Dutch (Netherlands)

_____ Chinese

_____ Jewish

_____ Polish

_____ Indian Subcontinent (e.g. Bengali, Pakistani, Indian)

_____ Black

_____ Central/South American

_____ Inuit

_____ North American Indian

_____ Métis

_____ Other (For example, Portugese, Greek, Filipino, Japanese, Vietnamese)

_____

27. Do you speak any language(s) besides English?

_____ no _____ yes. Which one(s)?_____

_____

28. Are any languages other than English regularly spoken in your home?

_____ no _____ yes. Which one(s)?_____

_____

EATING HABITS

29. What do you think is your child's present weight?

_____ pounds (lb.) or _____ kilograms (kg.)

30. What do you think is your child's present height?

_____ inches (in.) or _____ centimetres (cm.)

31. In the past 6 months, have you been worried about your child's eating habits? _____ no _____ yes

If you answered yes to the last question, please state why:
(Please check all the boxes that apply)

Eats too little _____
Eats too much _____
Does not eat regularly _____
Binge eating ("Pigging out") _____
Bad nutrition ("Junk food") _____
"Fussy" or "picky" eater _____
Vomiting after eating _____

32. Do you think your child is overly concerned about:

a) his/her body weight _____ no _____ yes
b) his/her body image _____ no _____ yes

33. Has anyone in your family had problems with:

(Check as many as apply)

	Child's Mother	Child's Father	Child	Child's Brother/ Sister	Uncle/Aunt Grandparent etc.
a) Too thin					
b) Too fat					
c) Weight conscious (Worried about weight)					
d) Dieting to lose weight					

****

Questions 34 to 36 apply only if your child is a girl.

* Sometimes when girls lose a lot of weight, their periods become irregular or stop for a while. Remember that you need not answer a question if you don't want to.

34. Has your daughter had her first menstrual period?

_____ yes _____ no

35. How old was your daughter when she had her first menstrual period?

_____ years old

36. If your daughter has started her periods, has she ever stopped having them?

_____ no _____ yes _____ don't know

Why? _____

****

Items 37 - 48 are statements about families and family relationships. For each one, circle the number above the category which best describes your family.

37. Planning family activities is difficult because we misunderstand each other.

1	2	3	4
Strongly agree	Agree	Disagree	Strongly disagree

38. In times of crisis we can turn to each other for support.

1	2	3	4
Strongly agree	Agree	Disagree	Strongly disagree

39. We cannot talk to each other about sadness we feel.

1	2	3	4
Strongly agree	Agree	Disagree	Strongly disagree

40. Individuals (in the family) are accepted for what they are.

1	2	3	4
Strongly agree	Agree	Disagree	Strongly disagree

41. We avoid discussing our fears and concerns.

1	2	3	4
Strongly agree	Agree	Disagree	Strongly disagree

42. We express feelings to each other.

1	2	3	4
Strongly agree	Agree	Disagree	Strongly disagree

43. There are lots of bad feelings in our family.

1	2	3	4
Strongly agree	Agree	Disagree	Strongly disagree

44. We feel accepted for what we are.

1	2	3	4
Strongly agree	Agree	Disagree	Strongly disagree

45. Making decisions is a problem for our family.

1	2	3	4
Strongly agree	Agree	Disagree	Strongly disagree

46. We are able to make decisions about how to solve problems.

1	2	3	4
Strongly agree	Agree	Disagree	Strongly disagree

47. We don't get along well together.

1	2	3	4
Strongly agree	Agree	Disagree	Strongly disagree

48. We confide in each other.

1	2	3	4
Strongly agree	Agree	Disagree	Strongly disagree

****

*Items 49 to 62 are statements about common major life events. Please indicate which of the following has happened to you or your spouse/partner during the past 12 months. Mark all answers that apply.

49. _____ Stopped full-time schooling

50. _____ Lost job or was unemployed

51. _____ Got married

52. _____ Someone moved into our home

53. _____ Had financial problems

54. _____ My spouse/partner and I separated

55. _____ Arrival of baby at home

56. _____ Someone moved out of our home

57. _____ Serious illness

58. _____ Serious illness of someone dear

59. _____ Quit or retired from full-time work

60. _____ Started working or changed jobs

61. _____ Death of someone dear

62. _____ None of the above

****

Child Behaviour Checklist

Below is a list of statements that describe some of the feelings and behaviour of children. For each statement, please mark the circle that best describes your son or daughter now or within the past 6 months. Please mark only one of the three circles for each statement. Mark your answers like this ⊗.

	Never or Not true	Sometimes or Somewhat true	Often or Very true
Acts too young for his/her age	001 ○	002 ○	003 ○
Allergy	004 ○	005 ○	006 ○
Argues a lot	007 ○	008 ○	009 ○
Asthma	010 ○	011 ○	012 ○
Bragging, boasting	013 ○	014 ○	015 ○
Can't concentrate, can't pay attention for long	016 ○	017 ○	018 ○
Can't get his/her mind off certain thoughts, obsessions	019 ○	020 ○	021 ○
Can't sit still, restless or hyperactive	022 ○	023 ○	024 ○
Clings to adults or too dependent	025 ○	026 ○	027 ○
Complains of loneliness	028 ○	029 ○	030 ○
Confused or seems to be in a fog	031 ○	032 ○	033 ○
Cries a lot	034 ○	035 ○	036 ○
Cruel to animals	037 ○	038 ○	039 ○
Cruelty, bullying, or meaness to others	040 ○	041 ○	042 ○
Daydreams or gets lost in his/her thoughts	043 ○	044 ○	045 ○
Deliberately harms self or attempts suicide	046 ○	047 ○	048 ○
Demands a lot of attention	049 ○	050 ○	051 ○
Destroys his/her own things	052 ○	053 ○	054 ○
Destroys things belonging to his/her family or other children	055 ○	056 ○	057 ○
Disobedient at home	058 ○	059 ○	060 ○
Disobedient at school	061 ○	062 ○	063 ○
Doesn't eat well	064 ○	065 ○	066 ○
Doesn't get along with other children	067 ○	068 ○	069 ○
Doesn't seem to feel guilty after misbehaving	070 ○	071 ○	072 ○
Easily jealous	073 ○	074 ○	075 ○

	Never or Not true	Sometimes or Somewhat true	Often or Very true
Eats or drinks things that are not food (eg: crayons, dirt, etc.)	076 ○	077 ○	078 ○
Fears certain animals, situations, or places other than school	079 ○	080 ○	081 ○
Fears going to school	082 ○	083 ○	084 ○
Fears he/she might think or do something bad	085 ○	086 ○	087 ○
Feels he/she has to be perfect	088 ○	089 ○	090 ○
Feels or complains that no one loves him/her	091 ○	092 ○	093 ○
Feels others are out to get him/her	094 ○	095 ○	096 ○
Feels worthless or inferior	097 ○	098 ○	099 ○
Gets hurt a lot, accident-prone	100 ○	101 ○	102 ○
Gets in many fights	103 ○	104 ○	105 ○
Gets teased a lot	106 ○	107 ○	108 ○
Hangs around with children who get in trouble	109 ○	110 ○	111 ○
Hears things that aren't there	112 ○	113 ○	114 ○
Impulsive or acts without thinking	115 ○	116 ○	117 ○
Likes to be alone	118 ○	119 ○	120 ○
Lying or cheating	121 ○	122 ○	123 ○
Bites fingernails	124 ○	125 ○	126 ○
Nervous, highstrung, or tense	127 ○	128 ○	129 ○
Nervous movements or twitching	130 ○	131 ○	132 ○
Nightmares	133 ○	134 ○	135 ○
Not liked by other children	136 ○	137 ○	138 ○
Constipated, doesn't move bowels	139 ○	140 ○	141 ○
Too fearful or anxious	142 ○	143 ○	144 ○
Feels dizzy	145 ○	146 ○	147 ○
Feels too guilty	148 ○	149 ○	150 ○

	Never or Not true	Sometimes or Somewhat true	Often or Very true
Overeating	151 ○	152 ○	153 ○
Overtired	154 ○	155 ○	156 ○
Overweight	157 ○	158 ○	159 ○
Physically attacks people	160 ○	161 ○	162 ○
Physical problems without known medical cause:			
a. Aches or pains	163 ○	164 ○	165 ○
b. Headaches	166 ○	167 ○	168 ○
c. Nausea, feels sick	169 ○	170 ○	171 ○
d. Problems with eyes	172 ○	173 ○	174 ○
e. Rashes or other skin problems	175 ○	176 ○	177 ○
f. Stomachaches or cramps	178 ○	179 ○	180 ○
g. Vomiting, throwing up	181 ○	182 ○	183 ○
h. Other	184 ○	185 ○	186 ○
(describe) _____			
Picks nose, skin, or other parts of body	187 ○	188 ○	189 ○
Poor school work	190 ○	191 ○	192 ○
Poorly coordinated or clumsy	193 ○	194 ○	195 ○
Prefers playing with older children	196 ○	197 ○	198 ○
Prefers playing with younger children	199 ○	200 ○	201 ○
Refuses to talk	202 ○	203 ○	204 ○
Repeats certain acts over and over; compulsions	205 ○	206 ○	207 ○
Runs away from home	208 ○	209 ○	210 ○
Screams a lot	211 ○	212 ○	213 ○
Secretive, keeps things to self	214 ○	215 ○	216 ○

	Never or Not true	Sometimes or Somewhat true	Often or Very
Sees things that aren't there	217 ○	218 ○	219
Self-conscious or easily embarrassed	220 ○	221 ○	222
Sets fires	223 ○	224 ○	225
Shy or timid	226 ○	227 ○	228
Sleeps less than most children	229 ○	230 ○	231
Showing off or clowning	232 ○	233 ○	234
Sleeps more than most children during day and/or night	235 ○	236 ○	237
Speech problem	238 ○	239 ○	240
Stares blankly	241 ○	242 ○	243
Steals at home	244 ○	245 ○	246
Steals outside the home	247 ○	248 ○	249
Stores up things he/she doesn't need	250 ○	251 ○	252
Strange behaviour	253 ○	254 ○	255
Strange ideas	256 ○	257 ○	258
Stubborn, sullen, or irritable	259 ○	260 ○	261
Sudden changes in mood or feelings	262 ○	263 ○	264
Sulks a lot	265 ○	266 ○	267
Suspicious	268 ○	269 ○	270
Swearing or obscene language	271 ○	272 ○	273
Talks about killing self	274 ○	275 ○	276 ○
Talks or walks in sleep	277 ○	278 ○	279
Talks too much	280 ○	281 ○	282
Teases a lot	283 ○	284 ○	285
Temper tantrums or hot temper	286 ○	287 ○	288
Threatens people	289 ○	290 ○	291

	Never or Not true	Sometimes or Somewhat true	Often or Very true
Thumb-sucking	292 ○	293 ○	294 ○
Too concerned with neatness or cleanliness	295 ○	296 ○	297 ○
Trouble sleeping	298 ○	299 ○	300 ○
Truancy, skips school	301 ○	302 ○	303 ○
Underactive, slow moving, or lacks energy	304 ○	305 ○	306 ○
Unhappy, sad or depressed	307 ○	308 ○	309 ○
Uses alcohol or drugs	310 ○	311 ○	312 ○
Unusually loud	313 ○	314 ○	315 ○
Vandalism	316 ○	317 ○	318 ○
Wets self during the day	319 ○	320 ○	321 ○
Wets the bed	322 ○	323 ○	324 ○
Whining	325 ○	326 ○	327 ○
Withdrawn, doesn't get involved with others	328 ○	329 ○	330 ○
Worrying	331 ○	332 ○	333 ○
Overly upset when leaving someone he/she is close to	334 ○	335 ○	336 ○
Overly upset while away from someone he/she is close to	337 ○	338 ○	339 ○
Sees self as more unwell or sickly than really is	340 ○	341 ○	342 ○
Worries that terrible things might happen	343 ○	344 ○	345 ○
Not as happy as other children	346 ○	347 ○	348 ○
Distractable, has trouble sticking to any activity	349 ○	350 ○	351 ○
Poor appetite, not hungry	352 ○	353 ○	354 ○
Feels his/her health should be better	355 ○	356 ○	357 ○

	Never or Not true	Sometimes or Somewhat true	Often or Very
Without physical cause suddenly loses:			
a. sight	358 ○	359 ○	360
b. ability to move arms or legs	361 ○	362 ○	363
c. hearing	364 ○	365 ○	366
d. voice	367 ○	368 ○	369 ○
e. ability to swallow	370 ○	371 ○	372 ○
f. consciousness	373 ○	374 ○	375 ○
g. feeling on skin	376 ○	377 ○	378 ○
h. other	379 ○	380 ○	381 ○
(describe) _____			
_____			
_____			
_____			
Worries that something bad will happen to people he/she is close to	382 ○	383 ○	384 ○
Cranky	385 ○	386 ○	387 ○
Has trouble enjoying self	388 ○	389 ○	390 ○
Worries a lot about health	391 ○	392 ○	393 ○
Has difficulty awaiting turn in games or groups	394 ○	395 ○	396 ○
Worries about doing the wrong thing	397 ○	398 ○	399 ○
Cannot keep friends	400 ○	401 ○	402 ○
Fidgets	403 ○	404 ○	405 ○

PLEASE BE SURE YOU HAVE MARKED ONE CIRCLE FOR EACH STATEMENT

The following is a list of long-term health problems or conditions that some children have. For each one, please indicate whether your child has experienced at least one of these during the past year.

		YES	NO
a)	Asthma	_____	_____
b)	Hay fever or some other allergy	_____	_____
c)	A heart problem	_____	_____
	If yes, please state what type of problem.		
	_____		
d)	Epilepsy, convulsions or seizures with or without fever	_____	_____
e)	Insulin dependent diabetes (juvenile)	_____	_____
f)	Arthritis	_____	_____
g)	Cystic Fibrosis	_____	_____
h)	Hemophilia or other bleeding	_____	_____
	If yes, please state what type of problem.		
	_____		
i)	Cerebral palsy	_____	_____
j)	Hearing or speech impairment	_____	_____
	If yes, please state what type of problem.		
	_____		
k)	Leukemia	_____	_____
l)	Other long-term health problem not mentioned above	_____	_____
	If yes, please state type of problem.		
	_____		

THIS ENDS THE QUESTIONNAIRE - THANK YOU VERY MUCH

PLEASE SEND THE QUESTIONNAIRE BACK TO US IN THE ENVELOPE PROVIDED

Children's Food and Mood Study
School of Medicine
University of Ottawa

General Instructions

These questionnaires ask about feelings, daily events and behaviour, including eating habits in children your age. We will read them together. They should take about 30 minutes to fill out. Before we start, let's read the following together.

Please print your name on the line below:

Your Name (Print)_____

Do not put your name anywhere else on the questionnaires.

* This is not a test. There are no right or wrong answers.
* Your answers to these questionnaires are private and will not change your marks at school. Your answers will be seen only by the people conducting this study. However, if there seems to be a problem, we will discuss it with you and your parents.
* Answer quickly with the first response that comes to mind; don't think too long about any one question.
* If you don't understand a question, answer what it means to you.
* If you can't decide how to answer a question you don't have to.
* You may stop at any time.

THIS PAGE WILL BE COLLECTED SEPARATELY AND KEPT SEPARATELY FROM THE QUESTIONNAIRES

Adapted Eating Attitudes Test – 27

Directions: Read each sentence. Circle the word that best tells what you think. The pictures of pies may help you remember the words.

---

1. I am very scared of being fat.

always usually often sometimes rarely never

2. I try not to eat when I am hungry.

always usually often sometimes rarely never

3. I think about food.

always usually often sometimes rarely never

4. I eat a lot.

always usually often sometimes rarely never

5. I cut my food into small pieces.

always usually often sometimes rarely never

6. I know how many calories are in the foods I eat.

always usually often sometimes rarely never

7. I try not to eat foods like bread and potatoes.

always usually often sometimes rarely never

8. I think other people want me to eat more.

always usually often sometimes rarely never

9. I throw-up after I eat.

always usually often sometimes rarely never

10. I feel very guilty after I eat.

always usually often sometimes rarely never

11. I think about being thinner a lot.

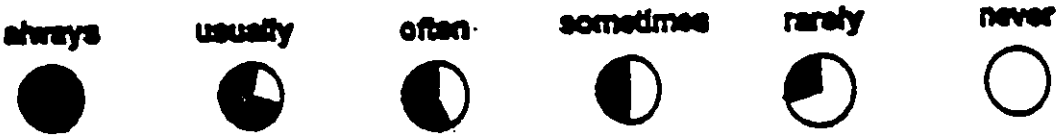
always usually often sometimes rarely never

12. I think about burning up calories when I exercise.

always usually often sometimes rarely never

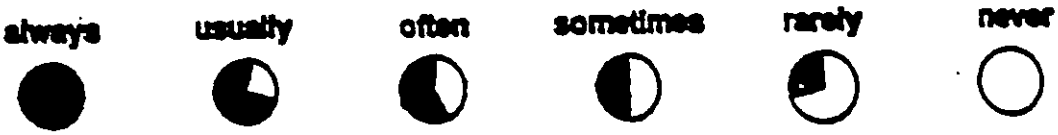
13. Other people think that I am too thin.

always usually often sometimes rarely never



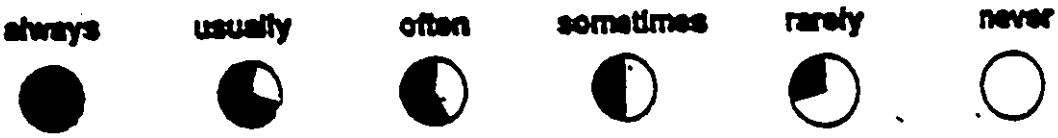
14. I often think about having fat on my body.

always usually often sometimes rarely never



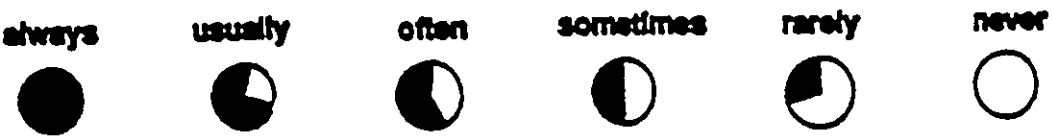
15. I take longer than others to eat my meals.

always usually often sometimes rarely never



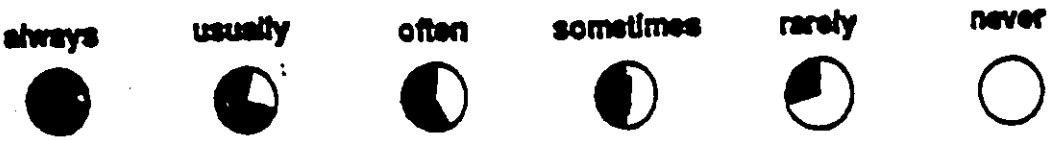
16. I try not to eat foods with sugar in them.

always usually often sometimes rarely never



17. I eat diet foods.

always usually often sometimes rarely never

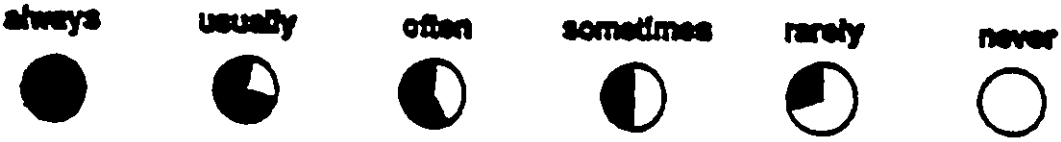


18. I feel that food controls my life.

always usually often sometimes rarely never

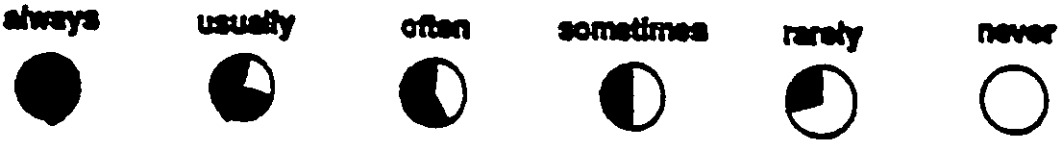
19. I can control myself around food.

always usually often sometimes rarely never



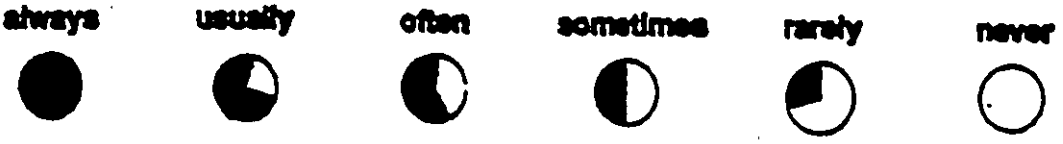
20. I feel that others push me to eat.

always usually often sometimes rarely never



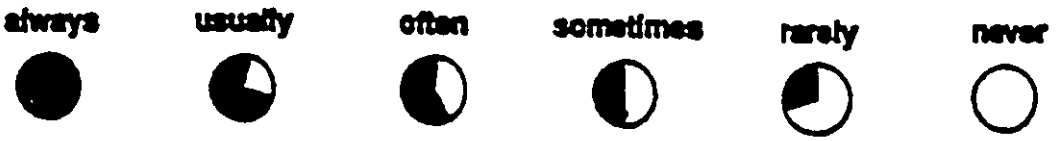
21. I spend too much time thinking about food.

always usually often sometimes rarely never



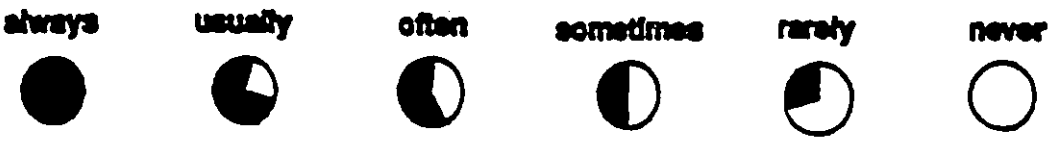
22. I do not feel comfortable after eating sweets.

always usually often sometimes rarely never



23. I try to lose weight.

always usually often sometimes rarely never



24. I feel like I cannot stop eating.

always usually often sometimes rarely never

25. I like my stomach to be empty.

always usually often sometimes rarely never

26. I enjoy trying new fattening foods.

always usually often sometimes rarely never

27. I want to throw-up after meals.

always usually often sometimes rarely never

Dr. Martha C. Rhyne Winkler
Rt. 9, 302 Poteat Drive
Morganton, NC 28655

Children's Depression Inventory

Kids sometimes have different feelings and ideas.

This form lists the feelings and ideas in groups. From each group pick one sentence that describes you best for the past two weeks. After you pick a sentence from the first group, go on to the next group.

There is no right answer or wrong answer. Just pick the sentence that best describes the way you have been recently. Put a mark like this "X" next to your answer. Put the mark in the box next to the sentence that you pick.

Here is an example of how this form works. Try it. Put a mark in the box next to the sentence that describes you best.

Example:

☐ **I read books all the time**

☐ **I read books once in a while**

☐ **I never read books**

Remember, pick out the sentences that described your feelings and ideas in the past two weeks.

1.

☐ I am sad once in a while

☐ I am sad many times

☐ I am sad all the time

2.

☐ Nothing will ever work out for me

☐ I am not sure if things will work out for me

☐ Things will work out for me o.k.

3.

- ☐ I do most things o.k.
- ☐ I do many things wrong
- ☐ I do everything wrong

4.

- ☐ I have fun in many things
- ☐ I have fun in some things
- ☐ Nothing is fun at all

5.

- ☐ I am bad all the time
- ☐ I am bad many times
- ☐ I am bad once in a while

6.

- ☐ I think about bad things happening to me once in a while
- ☐ I worry that bad things will happen to me
- ☐ I am sure that terrible things will happen to me

7.

- ☐ I hate myself
- ☐ I do not like myself
- ☐ I like myself

8.

- ☐ All bad things are my fault
- ☐ Many bad things are my fault
- ☐ Bad things are not usually my fault

9.

- ☐ I do not think about killing myself
- ☐ I think about killing myself but I would not do it
- ☐ I want to kill myself

10.

- ☐ I feel like crying every day
- ☐ I feel like crying many days
- ☐ I feel like crying once in a while

11.

- ☐ Things bother me all the time
- ☐ Things bother me many times
- ☐ Things bother me once in a while

12.

- ☐ I like being with people
- ☐ I do not like being with people many times
- ☐ I do not want to be with people at all

13. ☐ I cannot make up my mind about things

☐ It is hard to make up my mind about things

☐ I make up my mind about things easily

---

14. ☐ I look o.k.

☐ There are some bad things about my looks

☐ I look ugly

---

15. ☐ I have to push myself all the time to do my schoolwork

☐ I have to push myself many times to do my schoolwork

☐ Doing schoolwork is not a big problem

---

16. ☐ I have trouble sleeping every night

☐ I have trouble sleeping many nights

☐ I sleep pretty well

---

17. ☐ I am tired once in a while

☐ I am tired many days

☐ I am tired all the time

18.
- ☐ Most days I do not feel like eating
- ☐ Many days I do not feel like eating
- ☐ I eat pretty well

19.
- ☐ I do not worry about aches and pains
- ☐ I worry about aches and pains many times
- ☐ I worry about aches and pains all the time

20.
- ☐ I do not feel alone
- ☐ I feel alone many times
- ☐ I feel alone all the time

21.
- ☐ I never have fun at school
- ☐ I have fun at school only once in a while
- ☐ I have fun at school many times

22.
- ☐ I have plenty of friends
- ☐ I have some friends, but I wish I had more
- ☐ I do not have any friends

23.

- ☐ My school work is alright
- ☐ My school work is not as good as before
- ☐ I do very badly in subjects I used to be good in

24.

- ☐ I can never be as good as other kids
- ☐ I can be as good as other kids if I want to
- ☐ I am just as good as other kids

25.

- ☐ Nobody really loves me
- ☐ I am not sure if anybody loves me
- ☐ I am sure that somebody loves me

26.

- ☐ I usually do what I am told
- ☐ I do not do what I am told most times
- ☐ I never do what I am told

27.

- ☐ I get along with people
- ☐ I get into fights many times
- ☐ I get into fights all the time

Developed by M. Kovacs, Ph.D., University of Pittsburgh School of Medicine, Department of Psychiatry, Pittsburgh, PA 15261.

Daily Hassle Inventory
(Junior Form)

Listed below are things that sometimes happen to children your age. We are going to read each one. Think about whether it happened to you during the last week?

_____ TO _____

If it has not happened during the last week, circle the N in the NO box on the right. If it has happened to you during the last week, how did you feel when it happened? If it was very upsetting or stressful, circle 4; if somewhat upsetting or stressful, circle 3. If it was simply a bother and not upsetting, circle 2; if it was no trouble at all, circle 1.

If something happened during the week that was upsetting or stressful but is not on this list, write it on the blank, after number 18 or 19. Circle 3 or 4 to tell how upsetting or stressful it was.

	NO	YES			
		no trouble 1	a bother 2	upsetting 3	very upsetting 4
1. Something of mine was broken, lost or taken away.	N	1	2	3	4
2. I started to do (or planned to do something) but then before I could get it done, I was told to do something else.	N	1	2	3	4
3. Other people teased me really badly.	N	1	2	3	4
4. I got into a fight or had trouble (not punishment) with					
- friends	N	1	2	3	4
- parents	N	1	2	3	4
- others	N	1	2	3	4
5. I was punished.	N	1	2	3	4

	NO	YES			
		no trouble 1	a bother 2	upsetting 3	very upsetting 4
6. There were just too many things to do or going on at one time.	N	1	2	3	4
7. No one listened to me when I had something really important to tell.	N	1	2	3	4
8. I had to do something that was too hard for me.	N	1	2	3	4
9. I had to do something I didn't like.	N	1	2	3	4
10. My parents or other people important to me were arguing.	N	1	2	3	4
11. My parents or other people important to me were upset or in a bad mood (but not arguing).	N	1	2	3	4
12. Other people were disappointed with what I did.	N	1	2	3	4
13. I had to make a big decision.	N	1	2	3	4
14. I got hurt or was very sick.	N	1	2	3	4
15. I didn't understand what was happening.	N	1	2	3	4
16. I was afraid of making a mistake.	N	1	2	3	4
17. I couldn't do or have something that I wanted very, very much.	N	1	2	3	4
18. _____	N	1	2	3	4
19. _____	N	1	2	3	4

Daily Hassle Inventory
(Senior Form)

Listed below are things that sometimes happen to young people your age. Read each one. Has it happened to you during the last week?

_____, _____ TO _____, _____

If it has not happened during the last week, circle the N in the NO box on the right. If it has happened to you during the last week, decide whether it was stressful for you or not. If it was very stressful, circle 4; if somewhat stressful, circle 3. If it was simply bothersome and not stressful, circle 2 and if it was no trouble at all, circle 1.

If some things happened during the week that were stressful but are not on this list, write them on the blanks after number 23 or 24. Circle 3 or 4 to tell how stressful they were.

	NO	YES			
		no trouble 1	bothersome 2	stressful 3	very stressful 4
1. I was in a new situation or with new people.	N	1	2	3	4
2. A problem was caused when I did better or had a different idea from someone important to me.	N	1	2	3	4
3. I felt I couldn't do or understand something -that I thought I should be able to.	N	1	2	3	4
-that someone else expected me to.	N	1	2	3	4
4. Even though I understood something, I thought I was going to make a mistake.	N	1	2	3	4
5. I knew I could do everything, but there was just too much going on at one time.	N	1	2	3	4

	NO	YES			
		no trouble 1	bothersome 2	stressful 3	very stressful 4
6. I got into a fight or had trouble (not punishment) with					
- friends	N	1	2	3	4
- parents	N	1	2	3	4
- others	N	1	2	3	4
7. I was punished.	N	1	2	3	4
8. My parents or other people important to me were arguing.	N	1	2	3	4
9. Someone important to me was upset or in a bad mood (but not arguing).	N	1	2	3	4
10. People didn't want to do things with me or be with me.	N	1	2	3	4
11. People pestered me, picked on me or made fun of me.	N	1	2	3	4
12. I had a really difficult or important test in school.	N	1	2	3	4
13. I had to wait to find out how I did on a test or competition.	N	1	2	3	4
14. I had to wait to find out what punishment someone was going to give me.	N	1	2	3	4

	NO	YES			
		no trouble 1	bothersome 2	stressful 3	very stressful 4
15. I had to make a <u>decision</u> in a situation where I didn't know what to do.	N	1	2	3	4
16. I was <u>ordered around</u> or not allowed to do something important to me	N	1	2	3	4
17. Something important to me was <u>lost</u>, ruined or taken away.	N	1	2	3	4
18. Something I did didn't turn out right.	N	1	2	3	4
19. I had to <u>work really hard</u> at something I didn't want to do.	N	1	2	3	4
20. I was having fun or had plans to do something special and someone told me <u>to do something else</u>.	N	1	2	3	4
21. Other people <u>didn't pay attention</u> to me when I had an idea or had done something important.	N	1	2	3	4
22. I got <u>very sick</u> or <u>hurt</u>.	N	1	2	3	4
23. _____	N	1	2	3	4
24. _____	N	1	2	3	4

Major Event Inventory
(Junior Form)

Now think about last year.

_____ TO _____

Listed below are things that sometimes happen to children your age. We will read each one. If it has not happened during the last year, circle the N in the NO box on the right. If it has happened to you during the last year, how do you feel right now when you think about it. Do you feel very upset or stressed? If so, circle 4 in the top row in the box. Do you feel somewhat upset or stressed? If so, circle 3. Does it feel simply like a bother?, circle 2. Does it seem like no trouble?, circle 1.

Think for a minute, how did you feel when it happened (then)? Did you feel very upset or stressed?, circle 4 in the second row in the box. Did you feel somewhat upset or stressed?, circle 3. Was it just a bother?, circle 2. Was it no trouble?, circle 1.

If some major thing happened during the year that was upsetting or stressful but is not on this list, write it on the blank after number 8. Circle 1, 2, 3 or 4 to tell how upsetting or stressful it is now and how upsetting or stressful it was at the time.

	NO	YES			
		no trouble 1	a bother 2	upsetting 3	very upsetting 4
1. I started in a new school.	N	How it feels now: 1	2	3	4
		How it felt then: 1	2	3	4
2. Someone close to me was very sick or died.	N	Now: 1	2	3	4
		Then: 1	2	3	4
3. My parents separated or got a divorce.	N	Now: 1	2	3	4
		Then: 1	2	3	4
4. One of my parents started or stopped working.	N	Now: 1	2	3	4
		Then: 1	2	3	4
5. I was touched by someone in a way I didn't like.	N	Now: 1	2	3	4
		Then: 1	2	3	4

		NO	YES		
		no trouble 1	a bother 2	upsetting 3	very upsetting 4
6. Someone close to me went away.	N	Now: 1	2	3	4
		Then: 1	2	3	4
7. Someone moved into my house.	N	Now: 1	2	3	4
		Then: 1	2	3	4
8. _____	N	Now: 1	2	3	4
		Then: 1	2	3	4

Major Event Inventory
(Senior Form)

Listed below are things that sometimes happen to young people your age. Read each one. Has it happened to you during the last year?

_____, _____ TO _____, _____

If it has not happened during the last year, circle the N in the NO box on the right. If it has happened to you during the last year, decide whether it is stressful for you now and if so how stressful it is. If it is very stressful, circle 4; if it is somewhat stressful, circle 3. If it is simply bothersome, circle 2; if it is no trouble at all, circle 1.

Then decide how stressful it was for you at the time it occurred. Depending on how stressful it was, circle 1, 2, 3 or 4.

If some major thing happened during the year that was stressful but is not on this list, write it on the blank after Number 8. Circle 1, 2, 3 or 4 to tell how stressful it is now and how stressful it was at the time.

	NO	YES			
		no trouble 1	bothersome 2	stressful 3	very stressful 4
1. I started in a new school.	N	Now: 1 / When it occurred: 1	2 / 2	3 / 3	4 / 4
2. One of my parents started or stopped working.	N	Now: 1 / When it occurred: 1	2 / 2	3 / 3	4 / 4
3. Someone important to me started to care for someone else.	N	Now: 1 / When it occurred: 1	2 / 2	3 / 3	4 / 4
4. Someone important to me was very sick or died.	N	Now: 1 / When it occurred: 1	2 / 2	3 / 3	4 / 4
5. My parents separated or got a divorce.	N	Now: 1 / When it occurred: 1	2 / 2	3 / 3	4 / 4

	NO	YES			
		no trouble 1	bothersome 2	stressful 3	very stressful 4
6. I got hurt or was very sick.	N	Now: 1	2	3	4
		When it occurred: 1	2	3	4
7. I was touched by someone in a way I didn't like.	N	Now: 1	2	3	4
		When it occurred: 1	2	3	4
8. _____	N	Now: 1	2	3	4
		When it occurred: 1	2	3	4

Appendix C

Telephone Follow-up Procedure

Hello. My name is...I am the research assistant to Dr. DiNicola of the University of Ottawa's Faculty of Medicine. Your son/daughter recently participated in the **Children's Food and Mood Study** at school. I would like to thank you for allowing your child to take part in this study. We really appreciated their cooperation.

We received a large number of questionnaires back from parents who chose to participate in the study. I am calling you today to find out if you have been able to complete and mail the parent questionnaire that we sent to you.

Possible responses:

1. never received it: answer: Would you still like to participate in the study?

if yes: We will send you the parent questionnaire and a self-addressed stamped envelope. Thank you for your time.

no: Thank you for your time.

intended to fill it out, but didn't have the time: We would really appreciate it if you could complete the questionnaire.

don't have it : May we send you another copy.

no... I understand. You were under no obligation to participate. This call was to remind you to send the questionnaire back if you had intended to complete it.

Too sensitive... We understand that some of the material in the questionnaire could be seen as too personal. That is why the parent questionnaire was optional. However, this call was a reminder to you if you had intended to fill it out.

chose not to complete questionnaire:
Thank you for your time.

APPENDIX D

List of variables used in thesis

Variable name	Definition
ID	computer identification number
SUBJID	subject identification number
PARENTID	parent identification number
SCHOOL	school of subject
SEX	gender of subject
GRADEX	school grade of subject
AGESUBJ	age of subject in years
PFAMSTAT	family status
SES	socioeconomic status
PQRESP	parent questionnaire respondent
PQSUBJ	questionnaire answered by both parent and student
CHRONIC	parental report of chronic illness
ASTHMA	asthma
HSIMP	hearing and speech impairment
OTHERCI	other chronic illness
EAT	Eating Attitudes Test
DEPRESS	Children's Depression Inventory
STRESS	Daily Hassles Inventory
FAMILY	Family Assessment Device

APPENDIX E

Formulas for Calculation of Study Power

Power values were provided in tabular form in Cohen's Statistical Power Analysis for the Behavioral Sciences based on a formula by Dixon and Massey. These figures were established using the difference between means of two independent samples. In order to use Cohen's tables, the significance criterion, effect size (ES) and sample size had to be specified.

1. The significance criterion was set at an alpha of 0.05.

2. The effect size was based on the difference between the two population means divided by the within-population standard deviation. For a two-tailed test, as in this study, the following formula was used:

$$d = \frac{|m_a - m_b|}{\sigma}$$

In some cases an adjusted effect size has to be used because of unequal variances in the populations under study. In this situation, σ' replaces σ. There were unequal variances in the Eating Attitude Test scores for Grade 4 students in this study. Therefore, the following formula was used to adjust for effect size in the calculation of actual study power for this grade group.

$$\sigma' = \sqrt{\frac{\sigma a^2 + \sigma b^2}{2}}$$

3. If the size of the populations are unequal, it is necessary to adjust for unequal sample sizes. This adjustment was used both in the predicted and actual calculation of study power. In this case the harmonic mean n' replaced n by the formula:

$$n' = \frac{2n_a n_b}{n_a + n_b}$$

APPENDIX F

Numerical Components of Power Calculations

1) Evidence from the literature:

Study by Garner et al 1982 of Eating Attitudes Test

Group	N	mean EAT	$m_a - m_b$	σ	σ^2
clinical	160	36.1	26.2	17.0	289
non-clinical	140	9.9		9.2	84.64

2) Observed study power

Group	N	mean EAT	$m_a - m_b$	σ	σ^2
chronic illness	25	15.24	3.78	13.83	191.27
no chronic illness	127	11.46		7.45	55.50
chronic illness	19	8.79	.28	4.65	21.62
no chronic illness	90	8.47		6.73	45.70

APPENDIX G

STUDY RESPONSE BY SCHOOL

SCHOOL (N)	STUDENTS (n=190)	PARENTS (n=177)	BOTH (n=161)
GRADE 4	# (%)	# (%)	# (%)
Alymer (52)	37 (71.2)	36 (69.2)	34 (65.4)
Buckingham (22)	14 (63.6)	12 (54.5)	11 (50.0)
Chelsea (31)	21 (67.7)	19 (61.3)	18 (58.1)
Gatineau (33)	22 (66.7)	21 (63.6)	18 (54.5)
S.E. McDowell (57)	37 (64.9)	32 (56.2)	30 (52.6)
South Hull (74)	37 (50.0)	40 (54.1)	33 (44.6)
Wakefield (27)	22 (81.5)	17 (63.0)	17 (63.0)
TOTAL (296)			
GRADE 8			
Hadley (275)	91 (33.1)	98 (35.6)	78 (28.4)
Pontiac (75)	46 (61.3)	35 (46.7)	34 (45.3)
TOTAL (350)			
TOTAL SURVEYED	646		

APPENDIX H

Prevalence of reported chronic conditions
by age, sex, family status and socioeconomic status

Variables	Prevalence (%) of chronic illness	P Value
Gender		.27
Male (128)	19.53	
Female (145)	14.48	
Grade		.97
4 (161)	16.77	
8 (112)	16.96	
Family Status		.51
Both parents home (203)	15.77	
Single mom (27)	18.52	
Other* (40)	22.50	
Socioeconomic status (SES)**		.66
Less than 3.00 (34)	17.65	
3.00 - 3.99 (22)	18.18	
4.00 - 4.99 (22)	9.09	
5.00 - 5.99 (60)	13.33	
6.00 - 6.99 (65)	23.08	
Greater than 7.00 (16)	18.75	

* The "other" category includes the variable responses of biomom/stepdad, biodad/stepmom, single dad, shared parenting, foster care and widow-single mom. These categories were combined because of the small observed cell frequencies.

** Source: Blishen Scale revised for Canada (see reference # 53)

APPENDIX I

Hospital chart search results

School (# students)	Charts Pulled	No chart	Missing	No match
Chelsea (19)	14	5	0	0
Wakefield (17)	7	9	1	0
Pontiac (35)	19	15	1	0
S.E. McDowell (32)	15	16	1	0
South Hull (40)	25	12	3	0
Buckingham (12)	5	7	0	0
Aylmer (36)	24	12	0	0
Gatineau (21)	13	7	0	1
Hadley Jr. High (100)	65	32	3	0
TOTAL (312)	187	115	9	1

APPENDIX J

Kolmogorov-Smirnov One Sample Test
Using the Normal Distribution

Grade 4

Test Score	# cases	K-S Z	2-Tailed P
Eating	152	11.98	.000
Family	154	12.41	.000
Depress	150	9.85	.000
Stress	142	5.96	.000

Grade 8

Test Score	# cases	K-S Z	2-Tailed P
Eating	109	10.14	.000
Family	104	10.20	.000
Depress	107	9.05	.000
Stress	100	5.11	.000

APPENDIX K

Box's M Test: Tests of equality of group covariances

	Box's M	Approx. F.	DF		Sig.
Grade 4	0.84937	0.83054	1,	5848.2	0.3622
Grade 8	4.7931	4.6738	1,	4302.2	0.0307