Depression, Anxiety, and Conduct Problems in Outpatient Children: A Structural Equation Modeling Approach

by

Nancy E. Meyer

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DEPRESSION, ANXIETY, AND CONDUCT PROBLEMS IN OUTPATIENT CHILDREN: A STRUCTURAL EQUATION MODELING APPROACH

BY

NANCY E. MEYER

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Abstract

The relations among depression, anxiety, and conduct problems were examined in 115 children (ages 6-12) seeking outpatient mental health services. Three self-report measures of depression, anxiety, and conduct problems were administered to the children, and the parents completed six measures, two measures of each of the three syndromes. A two-factor model in which depression and anxiety were distinct but covarying syndromes was compared to a one-factor model. Similar one- and two-factor models of depression and conduct problems were also evaluated. The results revealed that both the one- and two-factor models of depression and anxiety fit the data well and that neither model was better than the other. With regard to depression and conduct problems, only the two-factor model fit the data well and it fit the data significantly better than the one-factor model.

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Introduction

There continues to be considerable debate over the classification of childhood disorders promulgated in the North American classification system of psychopathology, the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV; American Psychiatric Association, 1994). In particular, the classification of childhood depression and anxiety into separate categories has been questioned as research in childhood psychopathology continues to grow. Distinct diagnostic categories for depression and anxiety in children are relatively recent, first appearing in DSM-III (APA, 1980). For the most part, these disorders were extrapolated from adult disorders rather than empirically determined (Achenbach, Connors, Quay, Verhulst, & Howell, 1989). DSM has also been criticized for neglecting developmental factors in the identification and classification of childhood disorders (e.g., Achenbach, 1980; Cicchetti & Schneider-Rosen, 1984; Quay, 1986a). The operationalization of childhood depression and anxiety in DSM-III and its attendant criticism has served as an impetus to research in the area.

Another approach to the classification of childhood psychopathology has been the derivation of syndromes through multivariate statistical techniques that group co-occurring deviant behaviours (Achenbach & Edelbrock, 1983; Quay, 1986a). This approach argues for a taxonomy that is dimensional rather than categorical, and that takes into

account age and gender differences. Researchers using these methods have consistently identified a few broad-band dimensions (e.g., internalizing and externalizing problems) and a number of narrow-band syndromes which correspond only partially to DSM's classification of childhood disorders (see Achenbach & Edelbrock, 1978, and Quay, 1986a, for reviews).

As a developing area, much of the research in childhood psychopathology has been concerned with diagnostic questions: Does this syndrome exist in children? If so, how is it manifest? Can it be differentiated from other syndromes? There has been continuing controversy because of the extension of traditional adult-like syndromes to child psychopathology (Quay, Routh, & Shapiro, 1987). Many studies have shown considerable overlap between the syndromes of childhood depression and anxiety (e.g., Achenbach & Edelbrock, 1983; Hershberg, Carlson, Cantwell, & Strober, 1982; Stavrakaki, Vargo, Boodoosingh, & Roberts, 1987; Strauss, Last, Hersen, & Kazdin, 1988). Such findings raise the question of whether depression and anxiety can be differentiated in this age group. As well, there are long-standing questions about the relationship of childhood depression and conduct problems (e.g., Carlson & Cantwell, 1980b; Glaser, 1968), with recent evidence indicating a significant and clinically meaningful overlap between the two disorders (e.g., Kovacs, Paulauskas, Gatsonis, & Richards, 1988).

There is, therefore, a need to clarify the relations among the syndromes of depression, anxiety, and conduct problems to assist in the development of a taxonomy of childhood disorders that is empirically based and that reflects the experience of children. There are major questions regarding the status and classification of these syndromes which need to be addressed with a methodology that is well-suited to the evaluation of taxonomic models.

The aim of the present study is to examine the descriptive utility of the three syndromes of depression, anxiety, and conduct problems to determine which taxonomy of their relations corresponds most closely to the problems reported by children and parents. Confirmatory factor analysis will be used to evaluate the appropriateness of alternative taxonomic models. The following is a description of the three syndromes being investigated as well as the current state of empirical knowledge regarding the relations among these syndromes. The relations between child and parent report are also reviewed.

Childhood Depression

In order to define and clarify the construct of depression in children, it will be necessary to distinguish between depression as a symptom, syndrome, and disorder as do Angold (1988) and Carlson and Cantwell (1980a). Depression as a symptom refers to a single characteristic of dysphoric mood. Depression as a syndrome refers to a constellation of

symptoms which regularly occur together such as dysphoria, anhedonia, self-depreciation, appetite and sleep disturbance. Depression as a disorder (or illness) refers to a depressive syndrome with a particular etiology, prognosis and treatment response. These distinctions between symptom, syndrome, and disorder also apply to the constructs of anxiety and conduct problems. The present study examines the syndromes of depression, anxiety, and conduct problems in children. The self-report measures provide information about the severity of symptoms, but clearly do not provide sufficient information to warrant diagnosis of a disorder as they do not take context, duration of symptoms, and level of functioning into account.

Depression in children refers to a cluster of affective, cognitive, physiological, and behavioural characteristics which are evident over an extended period of time (DSM-IV, APA, 1994; Kazdin, 1987a; Kovacs & Beck, 1977). The affective component of depression has been found to manifest in sad mood or lack of pleasure in activities; the cognitive component in self-deprecatory and suicidal ideation; the physiological component in diminished energy, fatigue, and sleep and appetite disturbances; and the behavioural component in diminished motivation, school performance, and social interaction (Kazdin, 1987a; Kovacs & Beck, 1977).

Although there is increasing evidence that developmental factors affect the experience and expression of depression in

children (Bemporad & Wilson, 1978; Cicchetti & Schneider-Rosen, 1984), the current view, as reflected in DSM-IV, is that the essential features of depression are the same in children as adults. Hence, the same diagnostic criteria are used to identify depression in children as adults. For a diagnosis of depression, DSM states that dysphoric mood or loss of interest or pleasure in usual activities must be present for at least two weeks. Four of the following symptoms must also be present: poor appetite or overeating; sleep disturbance; psychomotor agitation or retardation; fatigue or lack of energy; difficulties in attention or concentration; feelings of worthlessness or guilt; and suicidal ideation or actions.

Dysthymia is a mood disorder that is not as severe as depression but is of longer duration. For a diagnosis of dysthymia in children, DSM states that depressed mood or irritable mood must be present for at least one year. Two of the following symptoms must also be present: poor appetite or overeating, sleep disturbance, fatigue or lack of energy, low self-esteem, difficulties in concentration or indecisiveness, and feelings of hopelessness.

The prevalence of childhood depression is difficult to estimate because of the different defining criteria and samples used. In a well-controlled study, Kashini et al. (1983) reported the prevalence of depression to be 1.8% in a sample of 9-year-old children from the general population.

In various clinical populations, estimates of prevalence have ranged from 2% to 60%, although typically estimates fall between 10% and 20% (see Kashini et al., 1981, for a review).

Anxiety Disorders

Anxiety disorders in children have a long history dating back to Freud's (1909/1963) work with fears and phobias. However, there has been a little empirical research investigating anxiety disorders in children until more recently (e.g., Bernstein, 1991; Bernstein & Garfinkel, 1986; Stavrakaki et al, 1987; Strauss et al., 1988).

Epidemiological studies indicate that worries and fears are quite common in children (see Orvaschel & Weissman, 1985, for a review). A more recent study of the general population (Bell-Dolan, Last, & Strauss, 1990) revealed that fears, avoiding contact with others, and somatic complaints were reported in 20% of the children, and that excessive concern with competence and need for reassurance was reported in one-third of the children. None of these childrens' symptoms, however, reached clinical proportions.

With regard to the prevalence of anxiety disorders, the Isle of Wight study (Rutter, Tizard, & Whitmore,1970) reported a prevalence of 2.5% for childhood anxiety states in the general population. Their defining criteria, however, were different from present-day criteria. More recent data on the prevalence of childhood anxiety disorders indicates prevalence rates of 8.7% to 21% for any anxiety disorder and

1% to 13% for individual anxiety disorders (Anderson, Williams, McGee, & Silva, 1987; Kashini, & Orvaschel, 1990; Lann, 1991 for a review).

Childhood anxiety disorders have been found to differ from anxiety in normal children. Werry (1986) has identified several features which distinguish clinically significant anxiety from more normative anxiety. Anxiety disorders have a greater frequency, severity, and persistence of symptoms which leads to impairment in normal functioning. Developmental tasks of childhood are often disrupted (e.g., going to school or establishing relationships with peers). The symptoms of anxiety may also be unusual or bizarre. Family or peer group norms and age appropriateness of the symptoms are also important considerations. For example, separation anxiety may be normative in preschoolers but certainly not in preadolescent children.

According to Werry (1986) and other colleagues, the characteristics of clinically significant anxiety include: (1) subjective symptoms such as worry and fear evident in self-report; (2) physiological symptoms manifest in a state of high arousal and/or somatic complaints; (3) cognitive features such as inattention, distractibility, and poor memory; and (4) behavioural features such as restlessness, anxious appearance, compulsions, and escape-avoidance behaviours such as shyness and school refusal.

With regard to the current nomenclature, DSM-IV identifies one anxiety disorder distinctive to childhood and adolescence: separation anxiety disorder. In separation anxiety disorder, anxiety is focused on the separation from major attachment figures, usually parents.

Adult forms of anxiety disorders may also be applied to children. These include: panic disorder, agoraphobia, phobia, social phobia, obsessive-compulsive disorder, post-traumatic stress disorder, acute stress disorder, and generalized anxiety disorder. Panic disorder involves panic attacks (or states of extremely high arousal and panic) which occur without a phobic or life-threatening stimulus. Agoraphobia involves fear and avoidance of certain places or situations. Phobia involves fear and avoidance of a specific situation or object. Social phobia involves anxiety and avoidance of certain kinds of social or performance situations. Obsessive-compulsive disorder is characterized by obsessive thoughts and compulsions. Post-traumatic stress disorder involves the reexperiencing of the traumatic event in conjunction with increased arousal and avoidance of stimuli associated with the traumatic event. Acute distress disorder involves symptoms of post-traumatic stress disorder which occur immediately after the traumatic event. Generalized anxiety disorder involves excessive anxiety and worry that is present for at least 6 months. (See DSM IV pp.

110-113 and 393-444 for complete criteria for anxiety disorders applicable to children.)

Researchers have been examining the reliability of the overall diagnostic category of anxiety disorders as applied to children and the individual diagnoses within it. There have been mixed results, with generally low diagnostic reliabilities (see Last, 1988, for a review). Reliabilities have been increased, however, to acceptable diagnostic levels with the use of more structured interview formats. A number of researchers have criticized DSM's taxonomy of anxiety disorders as applied to children (Achenbach, 1980; Quay, 1986a; Werry, 1986) and are currently engaged in examining the reliability and validity of the overall category and the individual diagnoses within it.

Conduct Disorder

Conduct disorder refers to a pattern of antisocial behaviour in which children violate the basic rights of others or major social rules (DSM-IV, APA, 1994; Kazdin, 1987b). Typically, there is an impairment in functioning at home and at school and the antisocial behaviour is regarded as unmanageable by significant others. Rather than a single antisocial act or symptom, antisocial behaviours are likely to occur together to form a constellation of symptoms or a syndrome. As a syndrome, conduct disorder includes several core behaviours such as fighting, temper tantrums, disobedience, theft, truancy, destroying property, and

running away (Quay, 1986b). Although some of these behaviours may be seen in varying degrees in children over the course of development, conduct disorder is antisocial behaviour which is clinically significant and which is clearly beyond the range of normal functioning. Compared to other childhood disorders, conduct disorder tends to be relatively stable over time and the prognosis tends to be poor (Kazdin, 1987b; McMahon, 1987).

The prevalence of conduct disorder is difficult to estimate because of the different defining criteria and samples used. Nevertheless, estimates of the prevalence of conduct disorder in the general population have ranged from 4% to 10% (Rutter et al., 1970). To illustrate the scope of the problem, research indicates that aggressiveness, conduct problems, and antisocial behaviour comprise from one-third to one-half of all child and adolescent referrals to mental health services (Robins, 1981).

Classification of conduct disorder is relatively straightforward. DSM-IV provides a list of readily observable criteria for conduct disorder consistent with previous description. (See DSM-IV, pp.85-91, for complete criteria for conduct disorder). The conduct disorder category is divided into two subtypes: childhood onset type and adolescent onset type. Lastly, DSM includes another category of conduct disordered behaviour, called oppositional disorder. Oppositional disorder refers to a pattern of

disobedient, negativistic, and oppositional behaviour typically toward adult authority figures.

There has been considerable empirical support for the category of conduct disorder, but there has been little support for the distinction between conduct disorder and oppositional disorder (see McMahon, 1987, and Quay, 1986b, for reviews). Instead research distinguishes conduct disorder in terms of being overt (e.g., aggression, temper tantrums, arguing) or covert (e.g., lying, stealing, alcohol/drug use) (Loeber & Schmaling, 1985).

The Relationship Between Childhood Depression and Anxiety

Over the years there has been considerable research and controversy regarding the relationship between depression and anxiety in adults (e.g., Breier, Charney, & Heninger, 1985; Feldman, 1993; Clark & Watson, 1991; Roth, Gurney, Garside, & Kerr, 1972). Two competing models of depression and anxiety have been suggested, along with a third intermediate position (Stravrakaki & Vargo, 1986). These conceptual models have also been recently discussed with respect to children (Brady & Kendall, 1992; Finch, Lipovsky, & Casat, 1989; King, Ollendick, & Gullone, 1991).

In the pluralistic model, depression and anxiety are viewed as distinct entities or syndromes which is a view reflected in DSM-IV, for both children and adults. In the unitary model, depression and anxiety are viewed as parts of one broader underlying process which is referred to by

different names. In the children's literature, the combination of depression and anxiety has been referred to as internalizing problems (Achenbach et al., 1983), anxious/depressed syndrome (Achenbach et al., 1989) or anxiety-withdrawal-dysphoria category (Quay, 1986). In the adult literature, and recently in the child literature, depression and anxiety have been combined under a broader construct of general emotional distress, currently referred to as negative affectivity (King et al., 1991; Watson & Clark, 1984). Stavrakaki and Vargo (1986) identified an intermediate position between the pluralistic and unitary models in which there are distinct groups of pure depression and pure anxiety disorders, and a third group of mixed depression and anxiety disorders. Clark and Watson (1991) also identified a mixed model in which depression and anxiety are combined under a broader construct of general emotional distress (or negative affectivity), but at the same time can be differentiated by high arousal for anxiety and low positive affect for depression.

The research on the relationship between childhood depression and anxiety is reviewed below with the focus on diagnostic and assessment studies. Diagnostic studies examine the co-occurrence of anxiety disorders and depression. Assessment studies examine the association between anxiety and depression using self-report and other measures. A variety of populations have been studied: school

children, outpatients, inpatients, and pediatric patients. Also, there has been a wide age range of children and adolescents in the populations studied. Thus, caution must be exercised in applying the findings to the specific developmental period of childhood.

Diagnostic Studies

Hershberg and colleagues (1982) conducted one of the first studies of the relationship between depression and anxiety in a clinical population of children and adolescents (ages 7-17). They compared 28 children with a DSM-III diagnosis of depression to 14 children with a diagnosis of anxiety disorder on parent, clinician, and child self-report measures. They found that depressed children and anxious children often showed many of the same symptoms. Notably, depressed children frequently reported symptoms of anxiety in addition to their depression, but anxiety disordered children tended not to report symptoms of depression.

Similar to a previously well-cited study (Bernstein & Garfinkel, 1986), Berstein (1991) examined the relationship between depression and anxiety in 96 chronic school refusers (ages 7-17). School refusers were placed into four diagnostic groups using DSM-III-R criteria, family interview and chart review. Several clinician and child self-report measures were administered. The breakdown of the diagnostic groups was as follows: depression only (28% of the sample), anxiety only (28%), both depression and anxiety (25%), and

neither depression or anxiety (16%). Children with comorbid depression and anxiety showed more severe symptomatology on the rating scales. Children who were only anxious or only depressed had similar ratings to each other. Thus, children with comorbid depression and anxiety were distinguishable from those with either disorder alone in terms of severity of symptomatology, and children who were only anxious or only depressed were indistinguishable from each other on self-report measures.

Strauss and colleagues (1988) examined the relationship between anxiety and depression in 106 outpatients (ages 5-17) referred to an anxiety disorder clinic. DSM-III diagnosis were made on the basis of structured interviews with children and parents. The whole range of childhood anxiety disorders was represented. Several child self-report measures of depression, anxiety and fear were administered. They found that 28% of youths with anxiety disorder also displayed concurrent depression. Again, children with comorbid depression and anxiety reported more severe anxiety symptoms, and they were older. Again, younger children, mainly with anxiety disorders, tended not to report depressive symptoms, nor did they differ from the psychiatric control group on measures of anxiety and depression.

Stavrakaki and colleagues (1987) examined the relationship between depression and anxiety in a Canadian sample of 84 child psychiatric inpatients (ages 6-16) who

were diagnosed with depression or anxiety disorder. There was no comorbid group of depression and anxiety in the design. Several clinician, parent and child self-report measures were administered which included measures of overall psychopathology, depression, anxiety, conduct problems and somaticism. The authors used a discriminant function analysis to determine whether depression and anxiety disorders could be differentiated. The analysis correctly classified 84% of the children into the original diagnostic groups. Depression and anxiety were differentiated by age, status, duration of the illness, and presenting problems. Compared to children with anxiety disorder, depressed children were older, they were more frequently hospitalized, their illness was of shorter duration, and they presented with emotional problems whereas anxious children often presented with behaviour problems. Notably, depression and anxiety were differentiated solely by clinician and parent ratings of depression.

As a part of a longitudinal study of childhood depression, Kovacs, Gatsonis, Paulauskas and Richards (1989) examined the effect of comorbid anxiety in sample of 104 depressed children (ages 8-13) referred for psychiatric treatment. DSM-III diagnosis were based on separate interviews of children and parents using a semistructured interview format. They found that 41% of the depressed children also had comorbid anxiety disorder, with the most

frequently occurring diagnosis being separation anxiety disorder and overanxious disorder. Anxiety disorders developed relatively early, in middle childhood, and depression also developed earlier if anxiety disorders were present. Anxiety preceded depression two-thirds of the time and persisted 50% of the time after the depression had remitted.

In summary, there has been a high rate of comorbidity of childhood depression and anxiety disorders, ranging from 25% to 50%. Some authors suggest that the overlap in diagnosis (and symptomatology) provides support for the unitary model of depression in which depression and anxiety are phases of one underlying process.

Rather than just examining comorbidity, many of the studies have taken a closer look at the relationship between depression and anxiety, and several patterns have emerged. Anxiety disordered children tend to be younger with anxiety presenting prior to adolescence, whereas depressed children tend to be older (Kovacs et al., 1989; Stavrakaki et al., 1987; Strauss et al., 1988). Children with anxiety disorder alone tend to have less severe symptomatology as this group is often indistinguishable from psychiatric or normal control groups on self-report measures (Strauss et al., 1988). It is more often the case that anxiety disordered children do not report depressive symptomatology, but when they do their anxiety is more severe (Hersberg et al., 1982; Strauss et

al., 1988). The group with comorbid depression and anxiety consistently present with the most severe symptomatology (Bernstein et al., 1991; Strauss et al., 1988). Thus, in most studies the comorbid depressed and anxious group can be distinguished from other groups. Some studies have shown that depressed only and anxiety only groups cannot be distinguished from each other by rating scales (e.g., Berstein, 1991). However, if they are to be distinguished by rating scales, rating scales of depression are better at doing so than rating scales of anxiety (Stavrakaki et al., 1987). Two studies have shown that clinical variables such as age of onset, duration, recovery, and presenting problem are important in distinguishing between depression and anxiety (Kovacs et al., 1989; Stavrakaki et al, 1987).

Assessment Studies

In one of a series of studies examining the psychometric properties of the Childhood Depression Inventory (CDI) in normal and emotionally disturbed children, Saylor, Finch, Spirito and Bennett (1984b) administered the CDI and several measures of anxiety to 63 psychiatric inpatients aged 7-16. The sample was divided into high and low depressed groups based on a median split of scores on the CDI. They found that children reporting high levels of depression also reported higher levels of anxiety on three of the four anxiety measures. In light of the results from their other studies which indicated that the CDI discriminated between

psychiatric and normal groups of children but not between depressed and nondepressed psychiatric groups, the authors concluded that the CDI measures a construct that overlaps with other psychiatric disorders particularly anxiety.

Norvell, Brophy, and Finch (1985) investigated the relations between depression and anxiety by examining the relationship between the factors of both constructs. They administered the CDI and two anxiety measures to 30 inpatient children with a mean age of 11 years 6 months. They found high correlations between depression and anxiety measures (*r*'s ranging from .46 to .70). They reported two main factors for the CDI: (1) a self-depreciation/self-criticism factor reflecting not feeling loved, hating oneself, and self-blame, and (2) a dysphoric mood factor reflecting feelings of sadness, tiredness, loneliness and failure. Notably, the dysphoric mood factor of the CDI was related to one of the anxiety measures and its factors but the self-depreciation/self-criticism factor was not related to any of the anxiety measures. The authors suggested that the relationship between depression and anxiety is complex; that dysphoric mood may be common to both depression and anxiety, and that depression can be differentiated from anxiety by certain negative cognitions.

Eason, Finch, Brasted, and Saylor (1985) examined the relations between various measures of depression and anxiety in 44 pediatric patients aged 7-14. These children had a

variety of medical problems and the authors hypothesized that they would be vulnerable to emotional distress. They administered several self-report and clinician ratings scales of depression and anxiety. They found measures of depression and anxiety to be significantly correlated in both self-ratings and clinician ratings. They concluded that the correlations indicated a lack of discriminant validity between depression and anxiety measures, regardless of the method of measurement (self-report or clinician ratings). They hypothesized that the characteristic being measured by the scales was a general level of emotional distress.

Wolfe, Finch, Saylor, Blount, Pallmeyer and Carek (1987) examined the relations between depression, anxiety and anger and broad-band internalizing and externalizing problems using a multitrait-multimethod methodology. Their sample was 102 psychiatric inpatients aged 6-16. Depression, anxiety and anger were assessed by several self-report and teacher-report measures. Broad-band internalizing and externalizing dimensions were assessed by the Child Behaviour Checklist, Teacher Report Scale (CBCL-TRF; Achenbach & Edelbrock, 1983). Using an ANOVA, they found adequate convergent validity, poor discriminant validity, and method variance (20.5%) that exceeded trait variance (6%). Notably, depression and anxiety measures were poorly discriminated whereas measures of anger were well-differentiated from depression and anxiety. Using a multiple regression analysis, they found

that the broad-band internalizing dimension was predicted by a combination of anxiety and depression measures whereas none of the self-report measures predicted the externalizing dimension. The authors concluded that they were assessing one broad-band construct of negative affectivity rather than two separate constructs of depression and anxiety.

As part of a larger study investigating the concurrent validity of the CDI, Strauss, Forehand, Frame and Smith (1984) examined the relationship between the CDI and anxiety measures in normal children, grades 2-5. They administered the CDI to 252 children, selecting a group of 15 children with the highest depression scores, and a matched comparison group of 15 children with low depression scores. Several self-report, teacher report, and peer report measures were administered to the two groups of children. Compared to children with low CDI scores, they found that children with high CDI scores reported higher levels of anxiety, and their teachers and peers also rated them as more anxious and withdrawn (but not as being more aggressive or as having conduct problems). The authors concluded that normal children with extreme scores on the CDI displayed many of the same characteristics as clinical populations of depressed children including high levels of anxiety.

Hodges (1990) examined the convergent and discriminant validity of depression and anxiety measures by comparing the scores of children diagnosed with depression, anxiety

disorder and conduct disorder. The sample consisted of 70 inpatients aged 6-13 years. She found that depressed children scored higher on the CDI than anxiety disordered or conduct disordered children. Anxiety disordered children scored higher on the Trait Scale of the State-Trait Anxiety Inventory for Children (STAIC-T; Spielberger, 1973) than depressed and conduct-disordered children. The Revised Children's Manifest Anxiety Scale (RCMAS; Reynolds & Richmond, 1985) did not differentiate anxious from nonanxious children. The findings provide support for the convergent and discriminant validity of the CDI and STAIC, both of which are self-report measures used in the present study. The author expressed the view that the CDI and STAIC are valid screening measures but she did not view them as appropriate for diagnosis since the measures demonstrated inadequate sensitivity and selectivity. Sensitivity of a self-report measure of depression, for example, reflects the extent to which children who are identified as depressed by the self-report measure are also diagnosed as depressed. Selectivity reflects the extent to which children who are not identified as depressed by the self-report measure are not diagnosed as depressed.

A review of the research that uses multivariate statistical methods to derive syndromes has shown symptoms of childhood anxiety and depression to be grouped into one larger domain (Achenbach & Edelbrock, 1978; Quay, 1986a). In

these studies a variety of rating methods and populations were used but two categories consistently emerged: a category labelled as anxiety-withdrawal-dysphoria or internalizing problems, and a category labelled as externalizing problems. The anxiety-withdrawal-dysphoria category was defined by internalizing types of behaviour: anxiety, fearfulness, shyness, sadness, social withdrawal, self-consciousness and crying. According to Quay (1986a) and others in the area, these studies do not provide empirical support for the distinction between childhood depression and anxiety.

These studies, however, provide some empirical support for distinguishing between some types of anxiety and depression in some age and gender groups. For example, the Child Behaviour Checklist (Achenbach & Edelbrock, 1983), distinguishes the broad-band categories of internalizing and externalizing problems, but also distinguishes the following narrow-band categories within internalizing problems for boys ages 6 to 11: schizoid or anxious, depressed, uncommunicative, obsessive-compulsive, and somatic complaints. The narrow-band categories within internalizing problems for girls of the same age group are: depressed, social withdrawal, somatic complaints, and schizoid-obsessive. It is apparent from the list that the narrow-band syndromes of anxiety only partially correspond to those of DSM-IV. Also, the syndromes are not exactly the same for boys and girls of this age. Other behavioural checklists

using similar multivariate techniques (e.g., Quay, 1983) do not distinguish depression as a syndrome in this age group. Thus, the evidence supporting the lack of distinction between childhood anxiety and depression is not as clear as researchers in this area might claim.

The Relationship Between Depression and Conduct Disorder

The relationship between childhood depression and conduct disorder has been the subject of controversy over the years as their comorbidity has posed both conceptual and nosological problems (Carlson & Cantwell, 1980b; Kovacs et al., 1988; Puig-Antich, 1982). Depression and conduct problems have generally been viewed as independent and contrasting conditions, and it has been difficult to reconcile how such qualitatively different conditions occur together (Kovacs et al., 1988). From a developmental perspective, behaviour is regarded as one of the major modes of expression in children (Cicchetti & Schneider-Rosen, 1984). Therefore, it is consistent that some children with emotional problems express them through deviant behaviour. Conversely, deviant behaviour may indicate negative internal states such as unhappiness. The notion that some children with conduct disorder have internalizing problems does not negate the well-substantiated category of conduct disorder in which children's problems are externally based in disruptive interactions with the environment.

The nosological problem over the years has been how to identify and classify depression and conduct disorder in the most clinically meaningful way. One early approach to this problem was to view depression in children as dominated or masked by features not traditionally associated with mood disturbances (Glaser, 1968; Toolan, 1962). Thus, various aggressive and antisocial behaviours were viewed as masking underlying depressive symptoms. This approach was found to be neither empirically sound nor clinically useful. Conduct problems were commonly observed with depression, particularly in adolescents. Thus, conduct problems were incorporated as associated features of childhood depression when this category was first introduced in DSM in 1980. As part of a larger nosological study, Carlson and Cantwell (1980b) found that the approach of assigning primary and secondary diagnoses in comorbid depression and conduct disorder was effective in differentiating prominent symptomatology. Another more recent approach to comorbid depression and conduct disorder has been to assign multiple nonhierarchical diagnoses (Kovacs et al., 1988; Puig-Antich, 1982).

Since childhood depression has only been recognized as an official diagnostic entity since 1980, a limited number of studies have examined the relationship between childhood depression and conduct disorder (Carlson & Cantwell, 1980b; Cole & Carpentieri, 1990; Kovacs et al., 1988; Marriage, Fine, Moretti, & Haley, 1986; Puig-Antich, 1982; Weiss &

Catron, 1994). The relationship between the two disorders has also been examined in populations of juvenile offenders, but the studies focus primarily on adolescents rather than children.

Generally, the studies examining the relationship between depression and conduct disorder have found that the two syndromes can be reliably differentiated (Carlson & Cantwell, 1980b; Kovacs et al., 1988; Marriage et al., 1986; Puig-Antich, 1982). On the other hand, studies have found a significant proportion of children, ranging from 16 to 33%, meeting clinical criteria for both disorders (Carlson & Cantwell, 1980b; Cole & Carpentieri, 1990; Kovacs et al., 1988; Marriage et al., 1986; Puig-Antich, 1982). The nature of this comorbidity has also been explored in a few studies.

In a study of 43 prepubertal boys with a diagnosis of depression, Puig-Antich (1982) found that one-third of the boys also qualified for a diagnosis of conduct disorder. The clinical picture of depression did not differ for children diagnosed with depression and those diagnosed with both depression and conduct disorder. With regard to the clinical picture of conduct disorder, the most frequently occurring problems were: chronic rule violations, persistent physical fighting, pathological lying, stealing, firesetting, school expulsion, and truancy. In most of the cases, the onset of depression preceded the onset of conduct disorder, and conduct disorder abated after the depression remitted.

Although the study did not seem to be particularly well-controlled in terms of the treatment component, it provides important data on the prevalence and clinical picture of comorbid depression and conduct disorder.

Marriage et al. (1986) examined symptomatology associated with different diagnoses. In a sample of 60 inpatient and outpatient children, 37% of the cases were diagnosed with affective disorder only; 18% of the cases with conduct disorder only; 18% of the cases with both affective disorder and depression; and 27% of the cases with other disorders. The results revealed that the severity of depressive symptoms in the depressed and conduct disordered group was similar to the severity of symptoms in the depressed only group, except that the depressed and conduct disordered group was less fatigued. The authors suggested that the depressed and conduct disordered group was a relatively homogenous group characterized by impulsivity, depression, and lack of fatigue which put them at high risk for suicidal behaviour.

As part of a longitudinal study of childhood depression, Kovacs and colleagues (1988) examined the prevalence and the relationship between depression and conduct disorder in 104 children (ages 8-13) referred for outpatient services. They found that 16% of the children with a diagnosis of depression also met DSM-III criteria for conduct disorder. The authors indicated that the rate of comorbidity of depression and

conduct disorder was relatively low compared to the rate of comorbidity of depression with other disorders such as anxiety. In the study, girls were as likely as boys to be diagnosed with comorbid conduct disorder. Similar to Puig-Antich, the onset of depression preceded the onset of conduct disorder in most cases, but unlike the former study, conduct disordered behaviour often persisted after the depression remitted. As such, the comorbidity between depression and conduct disorder reflects some clinically meaningful patterns, but there does not appear to be a consistent picture at this stage.

Three multitrait-multimethod studies (Kazdin, French, Unis, Esveldt-Dawson, 1983; Saylor, Baskin, Furey, & Kelly, 1984a; Shoemaker, Erickson & Finch, 1986) will be reviewed as they examine the validity of measures of childhood depression and conduct problems. All three of the studies used multiple measures of childhood depression which included the CDI. Definitions and measures of conduct problems varied across the three studies. In Kazdin et al., conduct disorder was assessed by a measure of aggression and by ratings of a semistructured interview corresponding to DSM-III criteria for conduct disorder. Saylor et al. used measures of angry feelings and deviant behaviour. Shoemaker et al. used the externalizing scale of the Child Behaviour Checklist (Achenbach & Edelbrock, 1983) which assesses aggressive, delinquent and hyperactive behaviour. The studies also

varied in the populations studied, ranging from normal school children (Saylor et al., 1984a; Shoemaker et al, 1986) to inpatients (Kazdin et al., 1983). In addition to child self-report, two studies used peer report and teacher report (Saylor et al, 1984a; Shoemaker, et al., 1986) and one study used parent report (Kazdin et al., 1983).

There were several consistencies and a few discrepancies in the findings of the three studies. Kazdin et al. (1983) supported the criterion validity of their measures of depression and conduct problems. They found that children with a diagnosis of depression or conduct disorder compared to children without such diagnoses had higher ratings of depression and aggression, respectively, as reflected in both child and parent ratings. All three studies used the Campbell and Fiske (1959) paradigm to evaluate convergent and discriminant validity of their measures. According to Campbell and Fiske, convergent validity is shown by significant and relatively high correlations between different raters for the same measure. Discriminant validity is shown by higher correlations "for the same symptom area completed by the same rater than for different symptom areas completed by the same or different raters" (Kazdin, 1983, p. 411). All three studies provided evidence supporting the convergent validity of their measures of depression and conduct problems, and two of the three studies provided evidence for the discriminant validity of their measures.

In all three studies the method variance (i.e., the type of rater) exceeded the trait variance (i.e., type of trait), suggesting that who was doing the rating accounted for more of the variability that what was being rated.

Matson and Nieminen (1987) is the only multitrait-multimethod study that examined the convergent and discriminant validity of all three constructs of depression, anxiety and conduct disorder. The participants were 95 children and adolescents (ages 11-18) who attended special education classes for behaviour disordered children. Each participant was also assigned a DSM-III diagnosis by the school clinician. Depression, anxiety and conduct disorder were evaluated by measures completed by the child and by the teacher. The results indicated that the depression measures demonstrated good convergent and discriminant validity. The measures for conduct disorder were less clear-cut: There was adequate convergent validity within raters but weaker convergent validity across raters. There was adequate discriminant validity for the measures of conduct disorder. The anxiety measures were problematic in that there was little evidence of convergent validity. In fact, the anxiety measures correlated more highly with measures of depression than they did with each other. The authors did not discuss the discriminant validity of the anxiety measures because the criteria for convergent validity was not met.

The Relationship Between Conduct Disorder and Anxiety

The relationship between anxiety and conduct disorder has received little attention in the literature with the exception of a few studies which combine anxiety and depression into a broader domain and examine its overlap with conduct disorder (e.g., Woolston et al., 1989) and a few studies which examine the overlap of some anxiety disorders with some externalizing disorders (e.g., Werry, Reeves, & Elkind, 1986). Although the relationship between anxiety and conduct disorder may be an important one, if indeed, anxiety can be differentiated from depression, this relationship is not a major focus in the present study.

The Relationship Between Child and Parent Report

Obtaining information from multiple sources is viewed as the optimal approach for providing more valid assessment and diagnosis (Achenbach, McConaughy & Howell, 1987; Campbell & Fiske, 1959; Renouf & Kovacs, 1994; Stavrakaki et al., 1987). Obtaining information from both children and parents can yield a more complete picture of the child's emotional and behavioural functioning. When disagreements occur, however, there is a tendency to ask which informant is more accurate. Achenbach et al. (1987) have aptly stated that there is no "gold standard" of truth. Each informant has a unique set of perspectives and biases, and disagreements reflect differing points of view rather than inaccurate reporting by either child or parent.

There are some areas in which parents are the best sources of information about the child. For example, parents are often the best sources of information about child's behaviour and personality (Kashini, Orvaschel, Burk & Reid, 1985). While acknowledging the limitations of children to reflect on and express themselves about their problems, there has been a gradual acceptance that children are credible informants for the purposes of assessment (Herjanic, Herjanic, Brown & Wheatt, 1975; Renouf & Kovacs, 1994). There are some areas in which children are the best and only source of information about a problem. For example, children provide valuable information about their thoughts and feelings.

Despite the sound basis for the use of multiple informants, research has consistently shown low-to-moderate parent-child agreement on children's symptoms assessed by rating scales or structured interviews (Achenbach et al., 1987; Barrett et al., 1991; Edelbrock, Costello, Dulcan, Conover & Kala, 1986; Herjanic & Reich, 1982; Ivens & Rhem, 1988; Kashini et al., 1985; Kazdin et al., 1983; Moretti, Fine, Haley, & Marriage, 1985; Renouf & Kovacs 1994; Stavrakaki et al., 1987). Parent-child agreement has been evaluated by examining correlations or kappa statistics, which measure the extent to which agreement exceeds chance expectations (Cohen, 1960). In an early study of parent-child report, Herjanic & Reich (1982) found that the majority

(73%) of symptoms on a structured interview had a kappa less than .31, whereas a kappa of .5 or higher is considered to show reliable agreement (Helzer et al., 1977). In a meta-analysis of 11 studies concerning parent-child agreement, Achenbach et al., (1987) found rs ranging from .07 to .40, with mean r = .25. Although some of the correlations were significant suggesting some association between parent and child report, the magnitude of the correlations was modest. In contrast, there has been a recent study (Nguyen et al., 1994) which has shown parent-child agreement to moderately high levels (kappas and correlations = .40 or higher). This was attained by using a modified assessment approach which attempted to resolve the discrepancies between parent and child. Many discrepancies were resolved in an additional interview, and for those that were not, the authors claimed that the process helped clinicians judge whose answers were more factual and reliable.

Many of the studies already cited have investigated the nature of the discrepancies between parent and child report. There have been some inconsistencies in the results, but some general patterns have emerged. Variables which potentially affect parent-child agreement can be grouped in the following categories: the characteristics of the child, the characteristics of the parent, and the type of symptom being assessed (Renouf & Kovacs, 1994).

With regard to the characteristics of the child, there is some evidence to suggest that parent-child agreement increases with the age of the child. In assessing the test-retest reliability of a structured interview, Edelbrock, Costello, Dulcan, Kalas, and Conover (1985) found that children below the age of 10 were generally unreliable reporters, as judged by test-retest reliability of less than .70. Reliability of children's self-report increased with age, so by the time the children were adolescents they were as reliable reporters as their parents. Renouf and Kovacs (1994) found that parent-child agreement increased with age: agreement ranged from a low of 45% for 10-year-olds to a high of 66% for 16-year olds. A number of other studies, however, have been unable to replicate this age effect (Barrett et al., 1991; Nyugen et al., 1994; Stavrakaki et al., 1987). Although other characteristics of the child have not been as consistently investigated as age, no clear pattern of results has emerged for children's gender, intelligence, inpatient and outpatient status, or parental social class (see Renouf & Kovacs, 1994 for a review).

There is some evidence to suggest that parental depression affects parent-child agreement, but a consistent pattern has not emerged. Renouf and Kovacs (1994) found that parental depression negatively affected parent-child agreement. Depressed mothers rated their children as more depressed than the children rated themselves 89% of the time.

On the other hand, Kashini et al. (1985) found that depressed parents reported fewer depressive symptoms than their children and that the parents tended to be insensitive to diagnosable depression in their children. Moretti et al. (1985) found that parents who rated themselves as more depressed also rated their children as more depressed. Ivens and Rehm (1988) found that father's depression, but not mother's depression, negatively affected parent-child agreement. Still other studies, have found no effect of parental depression on parent-child agreement (Nguyen et al., 1994).

There is more consistent evidence that the type of symptom being assessed affects parent-child agreement. In an early study, Herjanic and Reich (1982) found parent-child agreement to be highest for symptoms that were concrete, observable, severe, and unambiguous (e.g., hospitalizations, enuresis, fighting, temper tantrums, conduct problems). Low agreement was found for covert antisocial acts (e.g., alcohol and drug use) and for internal phenomena (e.g., worries, fears, obsessions, depression, suicidal ideation, and psychotic symptoms). Edelbrock et al. (1986) found the highest parent-child agreement for behaviour and conduct problems and the lowest agreement for affective and neurotic symptoms. Nguyen et al. (1994) found partial support for the hypothesis of higher parent-child agreement for behavioural versus ideational symptoms for the presence and absence of

symptoms but not for the severity of symptoms. Taken together, these studies suggest higher agreement for overt, easily observable behaviour than more covert behaviour and internal states.

The type of symptom also affects the frequency of parent and child report. Parents are more likely than children to report symptoms which are more troublesome to the parents such as behaviour and conduct problems (Edelbrock et al., 1986; Herjanic & Reich, 1982; Kashini et al., 1985). Parents also tend to report more school and relationship problems than their children (Herjanic & Reich, 1982). Children are more likely than their parents to report symptoms which are internal and subjective in nature such as anxiety, depression, psychotic symptoms and somatic complaints, as well as behaviour that the parents are not aware of such as alcohol and drug use (Herjanic & Reich, 1982; Edelbrock et al., 1986; Kashini, 1985).

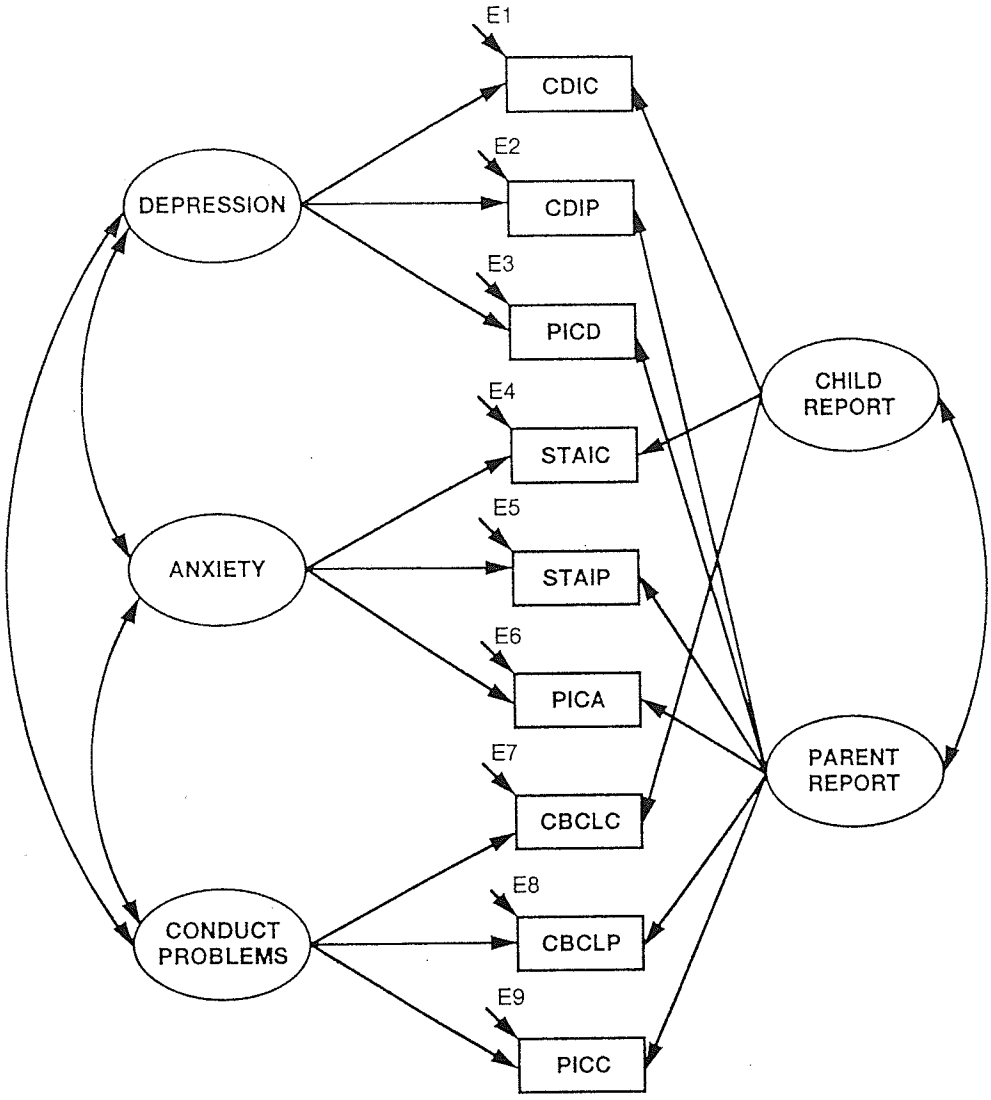
The Proposed Study and Analysis

The proposed study will examine the relations among the syndromes of depression, anxiety, and conduct problems in children to determine which taxonomic model best fits the self-report data obtained from children and their parents. It will use multiple measures of each syndrome, multiple informants, and a structural equation modelling methodology (confirmatory factor analysis) to analyze the resulting multitrait-multimethod matrix.

Structural equation modeling methodology will provide the framework for the study. It is a methodology which applies a hypothesis-testing framework to correlational data for the purpose of determining the plausibility of a theoretical model in a particular population (Fassinger, 1987).

Confirmatory factor analysis is a type of structural equation modeling methodology which focuses on the evaluation of measurement relations rather than causal relations. In the proposed study, confirmatory factor analysis will be used to define the syndromes through multiple measures and to evaluate the relations among the constructs: whether and which syndromes are functionally identical or correlated. Confirmatory factor analysis also evaluates the psychometric adequacy of the measures which is an important issue in the assessment of childhood disorders (Kazdin, 1989). Additionally, since method variance is an important factor affecting the assessment of childhood disorders, the method variance in the form of child- and parent-report is also assessed.

The confirmatory factor analytic model to be evaluated is depicted schematically in the path diagram in Figure 1. The model is also expressed in a series of structural equations which are used in a computer program to generate the estimated covariance matrix and compare it to the covariance matrix derived from the sample data. The



CDIC = Childhood Depression Inventory (child form);
CDIP = Childhood Depression Inventory (parent form);
PICD = Personality Inventory for Children - Depression scale;
STAIC = State-Trait Anxiety Inventory for Children - Trait scale (child form);
STAIP = State-Trait Anxiety Inventory for Children - Trait scale (parent form);
PICA = Personality Inventory for Children - Anxiety subscale;
CBCLC = Child Behaviour Checklist - Aggression and Delinquent scales (child form);
CBCLP = Child Behaviour Checklist - Aggression and Delinquent scales (parent form);
PICC = Personality Inventory for Children-Delinquency subscale.

Figure 1. Proposed structural equation model.
Statistically significant, $p < .05$.

correspondence between the two matrices, as judged by a number of goodness-of-fit indices, will indicate the fit of the model to the data.

The structural equation modeling methodology is well-suited to the purpose of the study which is to determine the most appropriate model of the relations among depression, anxiety, and conduct problems in children. As well as being able to evaluate the extent to which a model fits the data, the methodology permits the direct evaluation of competing models if the models are nested or hierarchical in nature (i.e., if one can be obtained from another by deleting or setting the value of a path). The alternative models of the relations between the syndromes evaluated in the present study are nested and thus permit the direct evaluation of competing models of the relationship between depression and anxiety.

Hypotheses

One group of hypotheses addresses the relationship between depression and anxiety in children. The three hypotheses in this group reflect different views of the relations between depression and anxiety as represented in the two different models.

1. The first hypothesis, that depression and anxiety are distinct but covarying syndromes, will be tested by a two-factor correlated model. In this model, the two latent

variables of depression and anxiety will be specified to allow them to intercorrelate (as represented by the curved arrow between depression and anxiety in Figure 1).

2. The second hypothesis, that depression and anxiety cannot be differentiated in children, will be tested by a one-factor model in which the path coefficient between depression and anxiety will be set to 1.0.

3. In the third hypothesis, the one- and two-factor models of depression and anxiety will be compared, and it is expected that one model will fit the data significantly better than the other model. In light of evidence for and against both models, there is no prediction as to which will be the better model.

The second group of hypotheses address the relations between depression and conduct problems. The hypotheses will be tested in a similar manner to the preceding hypotheses regarding depression and anxiety. Briefly, the hypotheses are as follows:

4. The two-factor model, depression and conduct problems are two distinct but covarying syndromes.

5. The one-factor model, depression and conduct problems are one syndrome.

6. The one- and two-factor models of depression and conduct problems will be compared, and it is expected that the two-factor model will be the better fitting model.

There are no hypotheses regarding the relationship between anxiety and conduct problems, although the correlation between them will be evaluated for significance.

Method

Overview

One hundred and fifteen children and their parents were recruited from two outpatient settings. Three self-report measures of depression, anxiety and conduct problems were administered to the children by interviewers blind to any diagnosis that might have been made previously. Parents completed an information sheet assessing demographic characteristics and six measures, two measures assessing each of the three syndromes. A brief summary of the findings for each child was forwarded to the referring agency as agreed to by the agency and the parents,. The main hypotheses were tested using confirmatory factor analysis.

Subjects

Subjects were 115 children (ages 6 ½ to 12 ½ years) and their parents seeking mental health services from two outpatient settings. One of the settings was the Manitoba Clinic in Winnipeg which is a medical clinic where pediatricians can refer children for psychological services. These psychological services are provided by a staff member and senior students of the Clinical Psychology Training Program at the University of Manitoba. The second setting was the Children's Services at the Royal University Hospital in Saskatoon. This is a psychiatric outpatient unit for children which is affiliated with the University of Saskatchewan.

There were several criteria for participation. Parents had to be seeking mental health services for their child who was within the age range of 7 to 12 years (allowing for a rounding up factor of a ½ year). If parents were seeking services for more than one child in the family, only one child was eligible to participate as determined by random assignment. This was done to mitigate the possibility of correlated error, with the same parents completing both children's questionnaires. The person completing the parent's questionnaires had to be in daily contact with the child for a minimum of six months to be able to reliably report on the child's behaviour. Children who were developmentally delayed or unable to understand the questionnaires were excluded from the study.

A total of 143 parents were referred from the two outpatient settings. Twenty-eight children and their parents did not participate for the following reasons: 13 parents declined, there were three no-shows, there were five incompletes where parents did not return their questionnaires, three cases were too complicated with various agencies to obtain permission in time for the child's appointment, three children were developmentally delayed or did not understand the questionnaires, and one child of a set of twins was omitted because only one child was eligible to participate from each family. Thus, there were 115 complete sets of child and parent questionnaires out of a possible 143 referrals which is an 80% participation rate.

There were a number of reasons for selecting clinically referred outpatients. Clinically-referred children were selected as subjects rather than "normal" children because depression and anxiety occur too infrequently in nonclinical populations such as school children (Achenbach & Edelbrock, 1983). There is also evidence of qualitative and quantitative differences in children's psychopathology in clinical and nonclinical populations (Pfeffer, Plutchik, & Mizruchi, 1986). Outpatient children were selected rather than inpatient children because it was thought that there would be fewer inpatients and that their problems would be more severe. Sample size was an important consideration in the study as confirmatory factor analysis requires a relatively large number of subjects (Bentler, 1980). Thus, the population of outpatient children was selected because it was likely to render a sufficiently large sample of children displaying the syndromes targeted in the study.

The age range of 7 to 12 years (actually 6 ½ to 12 ½ years) was selected to be representative of the childhood years. Younger children were not included because it was believed that younger children would have difficulty understanding the questionnaires, which is also the reason that developmentally delayed children were not eligible for participation. Adolescents were not included by setting the upper age range at thirteen years, although this is somewhat arbitrary considering that adolescence begins with puberty and is somewhat different for each child.

The participants were recruited in slightly different ways at the two locations as determined by negotiations with the agencies. At the Manitoba Clinic, parents were told of the study by their clinician at their first appointment. They were told that their participation was voluntary but that the findings might prove useful for assessment since feedback on each child's results was to be provided to the clinician. Children were told that they would be answering some questions that asked their opinion about themselves. If the parents and child were willing to participate, they were introduced to the interviewer. Parents were also provided with an information sheet and signed a consent form (see Appendix A) prior to participation. In the hospital setting, parents and children were provided with the same information and signed the same consent form as at the Manitoba Clinic. In the hospital setting, an introductory letter explaining the study was sent to eligible parents and then parents were contacted by telephone to determine if they would like to participate. If they agreed to participate, arrangements were made to meet the interviewer at their first appointment at the hospital. Arrangements were also made to administer the questionnaires to the child at the first appointment. These questionnaires were given to the child at the second appointment at Manitoba Clinic.

Procedure

In the first or second appointment at the agency, questionnaires were administered to the child. In a separate room, parents completed their questionnaires while they waited for their child. About one-third of the parents completed the questionnaires at their home, and returned them by mail. It was usually the mother who accompanied her child to the appointment and who therefore completed the parent's questionnaires. In cases where both parents accompanied the child, parents were asked to provide a common response to the questionnaires. This occurred in less than a dozen cases. The participants were treated according to the "Canadian Code of Ethics for Psychologists" (Canadian Psychological Association, 1991).

Three self-report measures of symptoms of depression, anxiety, and conduct problems were administered to the children by an interviewer blind to any diagnoses that might have been made previously. For the purpose of the study, there was no need for formal, categorical diagnosis although this might have proven useful for comparison purposes; rather the study was based on obtaining continuous, dimensional, and quantitative data on the symptoms of depression, anxiety and conduct problems. The questionnaires were counterbalanced to control for the effects of order of presentation. The questionnaires were read aloud by the interviewer to mitigate possible problems in readability. To facilitate privacy of responding, the interviewer read the questionnaire while the child responded on his or her copy.

This administration took 30-45 minutes.

The parent completed six measures, two assessing each of the three syndromes. The parent also completed a brief information sheet assessing various demographic characteristics (see Appendix B). This administration took 45-60 minutes. Parents were given the opportunity to ask questions about the questionnaires after the interview with their child was over.

A short summary of each child's results on the three measures was provided to the agencies as agreed to beforehand. Each summary was approved by a supervising psychologist, and parents had access to their child's summary through their clinician.

Materials

Measures of Depression

Children's Depression Inventory (CDI). The CDI (Kovacs & Beck, 1977) is a 27-item self-report questionnaire designed to assess the affective, cognitive, and behavioural symptoms of depression in children (see Appendix C). It was completed by the child and a modified version was also completed by the parent with reference to the child (see Appendix D). Such modifications have been made in previous studies in which multiple informants have been used (e.g., Kazdin, Colbus, & Rodgers, 1986; Kazdin et al., 1983).

The CDI is modelled after the Beck Depression Inventory for adults (Beck, Ward, Mendelson, Mock, & Erbaugh, 1961). The CDI includes more appropriate language and format for children, as

well as additional items assessing school performance and peer relations. It is designed for children between the ages of 8 and 13 years, and it has a Grade 3 reading level (Kovacs, 1980/81). Each item consists of three responses and the child is asked to choose the response which best describes him or her over the past two weeks. The responses are graded in severity from 0 to 2, with a score of 0 representing the absence of a depressive symptom, a score of 1 representing its presence, and a score of 2 representing its presence in severe form. The overall score ranges from 0 to 54, with higher scores representing more depressive symptomatology.

One of the major reasons the CDI was selected over other self-report measures of childhood depression is because it's one of the most widely used measures and because its psychometric properties have been the most thoroughly investigated. With regard to reliability, the CDI has good internal consistency with coefficient alphas ranging from .80 to .94 (Nelson, Politano, Finch, Wendel, & Mayhall, 1987; Saylor et al., 1984b; Smucker, Craighead, Craighead & Green, 1986). A 1-week to 1-month period would seem most meaningful for the evaluation of test-retest reliability (Sechrest, 1984) since the CDI is a measure of a state that extends for at least two weeks but not for an extended period of time. The CDI's test-retest reliability varies, depending on the population evaluated. The test-retest reliability in clinical populations has been shown to be moderately stable over a 1-month period ($\underline{r}$ = .72) (Kovacs,

1980/81) and more stable over a 1-week period (r = .87) (Saylor, et al., 1984b). The CDI has been shown to be less stable in normal samples with test-retest coefficients ranging from .38 for a 1-week period (Saylor et al., 1984b) to .77 for a 1-month period (Smucker et al., 1986).

The distribution of the CDI is typically positively skewed in that most subjects endorse few symptoms of depression (Nelson et al., 1987). This is to be expected considering the low prevalence of depression in children (Fleming & Offord, 1990). To deal with the problem of skewness in the present study, the CDI scores were transformed into normally distributed scores.

Of the self-report measures of depressive symptoms, the CDI appears to have considerable face validity and content validity since its items sample the domain of features regarded as essential to the syndrome (i.e., dysphoria, anhedonia, self-depreciation, vegetative and psychomotor symptoms) and the symptoms particular to this age group (e.g., decreased school performance and social interaction).

A number of studies have examined the validity of the CDI in terms of its ability to distinguish between depressed and nondepressed children. It has consistently been found to distinguish between clinically depressed and normal children (Kovacs, 1980/81; Saylor et al., 1984b). It varies, however in its ability to distinguish between depressed and nondepressed psychiatric groups which is a stronger test of its validity as a measure of depression. There have been some studies in which the

CDI has discriminated depressed from nondepressed psychiatric groups (Carlson & Cantwell, 1980b; Kazdin et al., 1986; Kovacs, 1980/81; Hodges, 1990; Lobovitz & Handal, 1985) and other studies in which the CDI has not been able to make such discriminations (Nelson et al., 1987; Saylor et al., 1984b). Multitrait-multimethod studies of depression using the CDI have shown that it has strong convergent validity but weak discriminant validity, particularly when anxiety is also being evaluated (e.g., Saylor et al., 1984a; Wolfe et al., 1987). The lack of discriminability in some studies suggests that the CDI may be more a measure of children's general emotional distress than a measure of depression. On the other hand, studies have found that a 59% to 88% diagnostic accuracy rate can be obtained with the CDI in clinical populations (Asnarnow & Carlson, 1985; Kazdin et al., 1986; Lobovitz & Handal, 1985).

Personality Inventory for Children - Depression Scale (PIC-D). The PIC (Wirt, Lachar, Klinedinst, & Seat, 1977/1984/1990) is a parent report measure designed to assess children's behaviour, affect, and cognitive ability (see Appendix E). It is designed for use for children ages 6-16 and it has a true/false response format. The PIC was developed as an MMPI-type instrument applicable to children. It has 12 clinical scales, one of which is the Depression (D) scale; the other two clinical scales used in the study are the Anxiety (ANX) scale and the Delinquency (DLQ) scale which are used to assess the symptoms of anxiety and conduct problems, respectively. The Depression

scale was developed by Froman (1971) and it consists of 46-items, with higher scores representing more depressive symptomatology.

The development and validation of the PIC included rational/content and empirical keying methods of scale construction (Wirt et al., 1990). Thus, in the case of the Depression scale, theory and clinical observation guided the generation of items which were then validated by comparing a criterion group of children diagnosed with depression to a group of children without such a diagnosis.

Lachar and LaCombe (1983) summarize the psychometric properties of the individual scales. The Depression scale demonstrates satisfactory internal consistency (coefficient alpha = .86) and test-retest reliability (coefficients ranging from .79 to .94 over a 2-week period in clinical populations). Several studies have supported the validity of the PIC by comparing the scales to other criterion such as DSM-III diagnosis, and parent, teacher, and clinician ratings of children's behaviour (e.g., Kline, Lachar, & Gdowski, 1987, 1988; Lachar, Gdowski, & Snyder, 1984). Additional validity studies are summarized in the manual (Wirt et al., 1990). A few studies have investigated the validity of the Depression scale specifically. Leon, Kendall, and Garber (1980) supported the Depression scale's concurrent validity with other external correlates such as ratings of self-esteem, and teacher and parent ratings of children's behaviour. Using the clinical cutoff of score D > 79T, Lobovitz & Handal (1985) found

a high overall classification accuracy rate of 90% for the Depression scale in an outpatient sample.

One of the major reasons the three scales of the PIC were selected is because it is the only parent report measure which has separate diagnostic categories for depression and anxiety. For example, the Child Behaviour Checklist (Achenbach & Edelbrock, 1983) does not distinguish two separate categories for anxiety and depression in this age group. In order to assess the constructs in the structural equation model, it is necessary to have separate measures of each syndrome which is what the PIC provides. Also since there are a number of measures in the study, it seems important to maintain some consistency in the measures used.

Measures of Anxiety

State Trait Anxiety Inventory for Children-Trait Scale (STAIC-T). The STAIC-T (Spielberger, 1973) is a 20-item self-report measure designed to assess the chronic symptoms of anxiety in children (see Appendix F). It is designed to be administered to children 9-12 years of age but may be used with younger children with average reading ability (Spielberger, 1973). It was completed by the child and a modified version was also completed by the parent with reference to the child (see Appendix G).

The STAIC-T is modelled after the State-Trait Anxiety Inventory-Trait Scale for adults (STAI-T; Spielberger, Gorsuch, & Lushene, 1970). The content of the STAIC-T is similar to the

STAI-T but the format has been modified to facilitate its use with children. The STAIC was modified by Fox and Houston (1983) to include more somatic complaints. The original scale was used in the present study, however, as its psychometric properties have been more well-researched.

The child responds to each item of the STAIC-T by selecting one of three responses which best describes how he or she usually feels. The responses are graded in severity with 1 indicating a symptom that occurs hardly ever, 2 indicating a symptom that occurs sometimes, and 3 indicating a symptom that occurs often. The total score ranges from 20 to 60, with higher scores representing more anxious symptomatology.

The STAIC was developed using nonclinical populations of school children, and it has norms based on grade and gender (Spielberger, 1973). Spielberger suggests that scores one standard deviation above the mean are indicative of normal variability in anxiety, whereas scores beyond this range are indicative of anxiety-proneness. There is more psychometric data available for nonclinical than clinical samples as the STAIC-T has only recently been used with clinical populations (e.g., Perrin & Last, 1992; Strauss et al., 1988).

One of the reasons that the STAIC-T was selected over the Revised Children's Manifest Anxiety Scale (RCMAS; Reynolds & Richmond, 1985) is because the pilot study showed that children found it more difficult to respond to the yes/no response format of the RCMAS than the STAIC which offers an intermediate response

choice. Achenbach and Edelbrock (1983) also indicate that a three-point response scale is preferable.

Data on test-retest reliability, internal consistency, and construct validity are presented in the manual (Spielberger, 1973). This data are based solely on nonclinical samples of children. The test-retest reliability of the STAIC-T ranges from .65 to .71, and the internal consistency ranges from .78 to .81. Thus for a normal population of children, the STAIC-T has moderate test-retest reliability and low to acceptable internal consistency. In terms of concurrent validity, the STAIC-T was correlated .75 with the RCMAS. Consistent with prediction, there was an inverse relationship between the STAIC-T and measures of ability and school achievement.

Evidence for the validity of the STAIC-T as a measure of anxiety in clinical populations has varied. The STAIC-T has been shown to differentiate between anxiety disordered and normal children (Perrin & Last, 1992) but not between anxiety and other psychiatric disorders (Perrin & Last, 1992; Strauss et al., 1988). Similar to the argument concerning the CDI, these results raise the question of whether the STAIC-T measures general emotional distress or anxiety. A recent study by Hodges (1990), however, has supported the discriminant validity of the STAIC-T in its ability to discriminate between anxiety disordered and nonanxiety disordered psychiatric groups.

The Personality Inventory for Children - Anxiety Scale (PIC-ANX). As part of the PIC (Wirt et al., 1990) which has been

previously discussed, the Anxiety scale was developed in a similar manner as the PIC - Depression scale. The development of the scale is based on theory, namely, that anxiety is a distinct syndrome in children and that it can be measured and differentiated on the basis of anxiety symptoms. The scale is also empirically based in that the initial validation studies supported its ability to distinguish between children with a diagnosis of anxiety disorder from those without such a diagnosis (Wirt et al., 1990). The Anxiety scale consists of 30 items (see Appendix E).

Lachar & LaCombe (1983) review the psychometric properties of the Anxiety scale. The Anxiety scale has adequate internal consistency (coefficient alpha ranging from .76 to .77) but appears to vary in its stability depending on the population evaluated (test-retest reliability coefficients range from .72 to .91 over a 1-week to 3-week period). As well as the initial validation studies (Wirt et al., 1990), subsequent studies of the PIC have supported the validity of the Anxiety scale using various criterion such as DSM-III diagnosis and multiple informant ratings of anxiety (e.g., Kline et al., 1988). Although some research has focused on the PIC - Depression scale, this has not been the case with the Anxiety scale; again, this likely reflects the general lack of research in the area of childhood anxiety until recently.

Measures of Conduct Problems

The Personality Inventory for Children - Delinquency Scale (PIC-DLQ). The Delinquency scale of the PIC (Wirt et al., 1990) is used as one of the parent report measures of conduct problems. It is a 47-item scale, with higher scores representing more delinquent symptomatology (see Appendix E).

Lachar and Lacombe (1983) review the psychometric properties of the Delinquency scale. The Delinquency scale has adequate internal consistency (coefficient alphas range from .74 to .79) but less than adequate stability for a 3-week period with some populations (test-retest reliability coefficients range from .52 to .90). Since the other measure for conduct problems, the Aggressive and Delinquent scales of the Child Behaviour Checklist, has high test-retest reliability, it is a reliable counterpart for the PIC - Delinquency scale. The Delinquency scale has been validated as part of the PIC in terms of external criteria such as DSM-III diagnosis, and parent, teacher, and clinician ratings of children's behaviour (e.g., Kline et al., 1988). Additionally, McAuliffe and Handal (1984) have supported the construct validity of the Delinquency scale in terms of predicting delinquent acts.

Child Behaviour Checklist-Revised - Aggression and Delinquent Scales (CBCL). The CBCL (Achenbach & Edelbrock, 1983) is designed to assess the behavioural problems of children, ages 4 to 16, as reported by their parents. In the complete scale, there are 118 items that refer to specific problem behaviours.

The CBCL is empirically derived using multivariate statistical techniques to group the problems of children into syndromes. It has several behaviour problem scales, the number and composition of which depend upon the sex and age of the child. The age 6-11 comparison group was used in the study, with differential scoring for boys and girls.

The Delinquent and Aggressive scales of the CBCL were used as the parent report measure of children's conduct problems (see Appendix H for the whole scale, with circles indicating the Delinquent and Aggressive items). The Delinquent and Aggressive scales of the CBCL were modified and used as the child self-report measure of conduct problems (see Appendix I). This modification involved simplifying language and adding 15 nonscorable positive items to counterbalance the negative items. The modification of the Delinquent and Aggressive scales for children was undertaken because there were few (if any) self-report measures of behavioural problems for children. Achenbach and Edelbrock (1987) have developed a CBCL youth report measure but its age range focuses primarily on adolescence (ages 11 to 18 years). The modified adult form was used rather than the youth self-report form because it was thought that it would be better to have children rate behaviours validated for their age group (albeit adapted from the adult form), than to rate behaviours validated for adolescents.

The items of the Delinquent and Aggressive scales reflect a variety of conduct problems (e.g., arguing, disobedience, temper

tantrums, fighting, stealing, vandalism, alcohol/drug use). There are 32 items for boys and 31 items for girls. In the parent report form, parents score the item 0 if the item is not true of their child, 1 if the item is somewhat or sometimes true of their child, and 2 if the item is very true or often true of their child. In the child report form, children score the items in the same manner as the adult form. The scores range from 0 to 64 for boys and 0 to 62 for girls, with higher scores representing more aggressive and delinquent symptomatology.

The reliability and validity of the CBCL has been well-established (e.g. Achenbach & Brown, 1989; Achenbach et al., 1989; Achenbach & Edelbrock, 1983; McMahon, 1987). The test manual (Achenbach & Edelbrock, 1983) summarizes the psychometric properties of the CBCL. The Aggressive and Delinquent scales in the 6 to 11-year-old group show high stability over a 1-week period with correlations ranging from .94 to .95 for boys and girls, respectively. The concurrent validity of the Aggression and Delinquent scales is supported by high correlations ($\underline{r}$s ranging from .84 to .87) with Conduct Disorder scales of other behaviour rating scales. Since there are no diagnostic criteria corresponding to the behaviour problem scales of the CBCL, referral to mental health services was used as the criterion against which to judge the validity of the scales. The results showed that 116 of the 118 items discriminated between referred and nonreferred children. For the Aggression and Delinquent scales, 22% to 38% of the variance in each scale score was

accounted for by significant associations with clinical status, age and sex, which is a moderate effect size (Cohen, 1977).

Results

Overview

The data in the study can be divided into two categories: demographic data which is mostly categorical in nature and which describes various characteristics of the participants; and data from the nine self-report scales which measure anxiety, depression, and conduct problems in children from two perspectives, the child and the parent.

The demographic variables include: site, administrator, sex, grade, ethnicity, family size, family position, relationship to the person completing the parents' questionnaires, type of family (e.g., one-parent, two-parent), mother's education, mother's work status (e.g., full-time, part-time), father's education, father's work status, and family socioeconomic status (SES).

The major measurement variables include: Children's Depression Inventory, child (CDIC) and parent (CDIP) forms; State-Trait Anxiety Inventory for Children, Trait scale, child (STAIC) and parent (STAIP) forms; Child Behaviour Checklist, child (CBCLC) and parent (CBCLP) forms; Personality Inventory for Children, Anxiety scale (PICA), Depression scale (PICD), and Delinquency scale (PICC).

The results section consists of three parts: (1) screening and preparation of the data for the major analysis, (2) a description of the demographic data and some minor analyses of that data, and (3) the major confirmatory factor

analyses carried out to evaluate the hypotheses about the relationships between depression, anxiety, and conduct problems.

Data Screening and Preparation

Missing Values

Prior to the analysis of the data, all variables were checked for accuracy of data entry and missing values. The relatively few missing values on the demographic variables were left missing and were deleted from those analyses.

Missing values for the major measurement variables were evaluated by procedures which calculated the total number of missing values for each item, for each subject, and for each scale. There were very few missing values on the children's scales. At most, there were one or two missing values for an item, and no subjects were missing more than a few responses overall. This can be attributed to the fact that the children's questionnaires were administered in person.

Although most of the parents' items had a low percentage of missing values (less than 5%), there was one item, number 23 on the parents' CDI, which was considered for deletion as 10% of its values were missing. The response choices for the item (for a boy) read: "a. His school work is alright. b. His school work is not as good as before. c. He does very badly in subjects he used to do good in." This item had also been frequently queried by parents because their children demonstrated consistently poor school performance whereas the

question asks about change in school performance, a symptom associated with depression. Further investigation of the item showed that it had a low intercorrelation (.26) with the rest of the scale. The item did not detract, however, from the scale's overall coefficient alpha of .86, and therefore was retained in the analysis.

The missing values on the scales were replaced with the item mode because it was judged to be the most representative value when response choices were limited to two or three values, and when, for the majority of items, the distributions were skewed with one value accounting for a high percentage of the responses.

Normality and Transformations

The data were examined for normality following procedures suggested by Tabachnick and Fidell (1989). The distribution of each scale was evaluated by inspection of histograms, boxplots, and normal probability plots. Some of the scales were positively skewed, with most of the scores falling at the lower end of the scale, and fewer scores falling at the higher end of the scale. This is consistent with the design of clinical scales which identify clinically significant problems in what is likely to be a low proportion of children. Tests of skewness, kurtosis, and normality were carried out revealing four scales with nonnormal distributions: the CDIC, the CDIP, the PICD, and the CBCLC.

Square root transformations were applied to these scales producing normal distributions in all four cases.

Outliers

The inspection of scale distributions revealed possible univariate outliers. All of the scales were transformed to standardized scores to inspect for univariate outliers. Based on the criteria of $z > |3|$, four outliers (three cases) were identified. Following the square root transformations, however, all four of the univariate outliers were less than three standard deviations from the mean.

The data were examined for multivariate outliers by computing the Mahalanobis distance for each case. Using a conservative probability estimate ($p < .001$) (Tabachnick and Fidell, 1989), no multivariate outliers were found.

Linearity and Homoscedasticity

An examination of bivariate scatterplots of the major variables that were not initially normally distributed was carried out to inspect for linearity and homoscedasticity. The assumptions of linearity and homoscedasticity were met following transformations of the CDIC, CDIP, CBCLC, and PICD.

Statistics of the Measures

Means, standard deviations, and internal consistencies of the scales of anxiety, depression, and conduct problems were assessed and are reported in Table 1. The means and standard deviations of the scales are comparable to those reported in previous studies of clinical samples.

Table 1

Statistics for the Scales of Depression, Anxiety, and Conduct Problems

Variables	Mean	SD	Alpha[a]
Depression			
CDIC	8.49	6.40	.82
CDIP	12.52	7.59	.87
PICD	16.90	7.88	.88
Anxiety			
STAIC	36.01	7.40	.84
STAIP	38.16	7.40	.86
PICA	10.70	4.96	.78
Conduct Problems			
CBCLC (Boy)	14.49	9.34	.90
CBCLC (Girl)	15.41	8.34	.85
CBCLP (Boy)	22.75	12.67	.94
CBCLP (Girl)	18.63	11.15	.92
PICC	17.80	5.83	.74

Note. N=115. CDIC=Childhood Depression Inventory (child form); CDIP=Childhood Depression Inventory (parent form); PICD=Personality Inventory for Children-Depression scale; STAIC=State-Trait Anxiety Inventory for Children-Trait scale (child form); STAIP=State-Trait Anxiety Inventory for Children-Trait scale (parent form); PICA=Personality

Table 1 continued

Inventory for Children-Anxiety subscale; CBCLC=Child Behaviour Checklist-Aggression and Delinquent scales (child form); CBCLP= Child Behaviour Checklist-Aggression and Delinquent scales (parent form); PICC=Personality Inventory for Children-Delinquency subscale.

[a] Cronbach's alpha.

Internal consistencies ranged from .74 to .94 across all scales.

Multicollinearity

Pearson r correlations were computed to assess the relations among the major measurement variables (see Table 2) and to inspect for multicollinearity. Generally, if two variables are highly correlated (i.e., greater than .89), there is reason to suspect the presence of multicollinearity. (Tabachnick and Fidell, 1989). No correlations were of such magnitude as to raise this concern.

Demographic Data

Study Characteristics

The data was gathered in a two year time period from January, 1991 to January, 1993. The data was gathered from two sites: 81 subjects were from the Royal University Hospital in Saskatoon and 34 subjects were from the Manitoba Clinic in Winnipeg. To determine if there were any group differences between the two sites in demographic

Table 2

Pearson r Correlations between the Scales of Depression, Anxiety and Conduct Problems - Before Transformation

	CDIC	CDIP	PICD	STAIC	STAIP	PICA	CBCLC	CBCLP
CDIP	.33							
PICD	.30	.81						
STAIC	.50	.17	.21					
STAIP	.22	.73	.74	.13				
PICA	.26	.71	.82	.24	.77			
CBCLC	.48	.17	.16	.45	.16	.11		
CBCLP	.28	.62	.58	.14	.40	.47	.33	
PICC	.35	.56	.49	.16	.34	.28	.41	.76

Note. CDIC=Childhood Depression Inventory (child form); CDIP=Childhood Depression Inventory (parent form); PICD=Personality Inventory for Children-Depression scale; STAIC=State-Trait Anxiety Inventory for Children-Trait scale (child form); STAIP=State-Trait Anxiety Inventory for Children-Trait scale (parent form); PICA=Personality Inventory for Children-Anxiety subscale; CBCLC=Child Behaviour Checklist-Aggression and Delinquent scales (child form); CBCLP= Child Behaviour Checklist-Aggression and Delinquent scales (parent form); PICC=Personality Inventory for Children-Delinquency subscale.

characteristics, t tests were carried out on the following variables: sex, grade, ethnicity, family size, family position, relationship to person completing parents' questionnaires, type of family, mother's education, mother's work status, father's education, father's work status, and family SES. There was only one significant group difference at $p < .05$ which is the alpha level used for all statistical tests. There was a significant site by sex difference, $\chi^2(1, N = 115) = 5.85$, $p = .02$, indicating that boys were overrepresented in the Saskatoon sample relative to the Winnipeg sample. For the most part, then, despite the sites being in two different provinces, they were comparable on the set of demographic variables studied.

Since one site was a psychiatric hospital outpatient setting and the other site was a psychology outpatient clinic, it was thought that there might be site differences in the severity of the problems. To determine if there were any group differences between the two sites, t-tests were carried out on the major measurement variables. There were no differences between the hospital and the psychology clinic on measures of depression, anxiety and conduct problems. Thus, the data from the two sites were collapsed for the major analysis.

There were three interviewers: Interviewer one administered 48.7% of the questionnaires; Interviewer two administered 15.7%, and Interviewer three administered 35.7%.

To determine if there were any group differences between the scores obtained by the three administrators on the major measurement variables, three one-way analyses of variance (ANOVA) were carried out. No differences were found for measures of depression, anxiety, and conduct problems.

Child Characteristics

The children ranged in age from 6.8 to 12.5 years, with an average age of 9.5 years. They spanned Grade 1 to Grade 6. Ninety-four percent of the children were identified as Caucasian, 4% were identified as Aboriginal, and 2% were from other racial backgrounds. Seventy-six percent of the sample were boys and 24% were girls. The finding that boys made up a greater proportion of the outpatient caseload than girls is consistent with the literature (Patterson, 1982). There may be various reasons for this phenomena including developmental lag in boys, and differential socialization for boys and girls, which results in boys having more behaviour problems than girls. Since there are more referrals for behaviour problems than other problems, this would mean that more boys would be referred. To determine if there were any sex differences in anxiety, depression and conduct problems, t-tests were carried out. As can be seen in Table 3, two tests were significant at $p < .05$. Girls had higher self-ratings of anxiety than boys, t (113) = 1.95, p = .05.

Table 3

t tests of Sex Differences for the Scales of Depression Anxiety and Conduct Problems

		Mean	t Value	p Value
CDIC	Boys	8.33	.47	.95
	Girls	9.00		
CDIP	Boys	12.53	.03	.97
	Girls	12.48		
PICD	Boys	16.77	.32	.74
	Girls	17.33		
STAIC	Boys	35.27	1.95	.05*
	Girls	38.40		
STAIP	Boys	37.61	1.44	.15
	Girls	39.62		
PICA	Boys	10.29	1.57	.11
	Girls	12.00		
CBCLC	Boys	14.47	1.49	.63
	Girls	15.44		
CBCLP	Boys	22.75	1.52	.13
	Girls	18.63		
PICC	Boys	18.61	2.78	.006**
	Girls	15.15		

Note. Boys n=88; girls n=27. Note. CDIC=Childhood Depression Inventory (child form); CDIP=Childhood Depression Inventory (parent form); PICD=Personality Inventory for

Table 3 continued

Children-Depression scale; STAIC=State-Trait Anxiety Inventory for Children-Trait scale (child form); STAIP=State-Trait Anxiety Inventory for Children-Trait scale (parent form); PICA=Personality Inventory for Children-Anxiety subscale; CBCLC=Child Behaviour Checklist-Aggression and Delinquent scales (child form); CBCLP= Child Behaviour Checklist-Aggression and Delinquent scales (parent form); PICC=Personality Inventory for Children-Delinquency subscale.

* $p < .05$.

** adjusted Bon Ferroni $p < .006$.

Parents rated boys as having more conduct problems than girls, t (113) = 2.78, p = .006, although this pertains to only one measure of conduct problems, the PICD. When the Bon Ferroni correction for multiple testswas calculated ($p <$ .006), only the differential rating of conduct problems was significant at the adjusted alpha level.

Family Characteristics

The number of the children in the families ranged from 1 to 8 children, with an average number of 2.5 children per family. Sixteen percent of the children had no siblings; 41% had 1 sibling; 31% had 2 siblings; and 12% had 3 siblings or more. With regard to family position, 30% were the youngest child; 38% were the oldest; 15% were the middle child; and 1 child (.9%) was one of a set of twins. Most of the children (90%) were the biological child of the person completing the

parents' questionnaires; 6% of the children were adopted; 2% were step children; 2% were foster children; and 1 child (.9%) was the grandchild of the person completing the questionnaires. The majority of the children (72%) lived in two parent families; 23% lived in one parent families, most of which (92%) were headed by women; 3% of the children lived with both parents who lived separately; 1 child (.9%) lived in a foster family; and 2% lived with one parent and extended family.

Socioeconomic Characteristics

With regard to education, 18% of the mothers and 24% of the fathers did not complete high school; 37% of the mothers and 31% of the fathers completed Grade 12; and 46% of the mothers and 45% of the fathers had some type of post-secondary education ranging from technical school training to professional degrees at university. Thirty-seven percent of the mothers were employed full time; 30% were employed part time; 30% were homemakers; 7% were students; and 5% were unemployed. Ninety-two percent of the fathers were employed full time; 3% were employed part time; 4% were unemployed; and 1 father (.9%) was on sick leave.

Socioeconomic status (SES) was determined by occupation using the Standard Occupational Classification (1980) and the 1981 Census Unit Groups (Statistics Canada, 1981). Using the Pineo-Porter-McRoberts' socioeconomic classification of occupations (Pineo, 1984), families were ranked from 1 to 16

(with 16 being the highest SES grouping) based on the occupations of the parents. When both parents were employed, the highest ranking occupation was used. Parents without income from employment were classified as 0. Using this classification scheme, 9% of the families had no income from employment (category 0); 23% percent were in the unskilled or semi-skilled groups (categories 1 to 5); 29% were in the skilled groups (categories 6 to 8); and 40% were in the supervisory, management or professional groups (categories 9 to 16).

Of the 23% of single parent families, 92% were headed by women and 8% were headed by men. There appeared to be a large discrepancy in socioeconomic status between female and male heads of single households with means of 4.6 (4.4 SD) and 10.5 (4.9 SD), respectively. A comparison of female and male heads of single householders could not be carried out as the two groups were too disproportionate in size.

Confirmatory Factor Analyses

Overview

Confirmatory factor analyses (CFA) were used to evaluate the fit of hypothesized models of depression, anxiety, and conduct problems to the sample data obtained by children and parents. A structural equation modelling program, Version 3.0 of EQS (Bentler, 1989) was used. For each model, overall model fit was evaluated by goodness-of-fit indices, and individual parameters (i.e., factor loadings and factor

correlations) were evaluated for statistical significance. Competing models of the relations between depression and anxiety, and depression and conduct problems, were compared directly to one another using chi-square difference tests to determine if one model fit the data better than another. In total, five confirmatory factor analyses addressed the hypotheses directly. A second set of confirmatory factor analyses addressed the more general issue of construct validity since the model of depression, anxiety and conduct problems is a multitrait-multimethod model (i.e., three traits and two methods) which lends itself to such an evaluation.

Statistical Requirements

CFA has several requirements for successful analysis. It requires that the variables being measured by the indicators are continuous. The measures in the present study use ordinal (i.e., 2 and 3 point) response scales but this is not a problem since the indicators being factored are scale scores rather than items (Bernstein & Teng, 1989).

CFA is very sensitive to violations of multivariate normality. As discussed previously, square root transformations were applied to four of the scales resulting in normal distributions. The correlational matrix resulting from these transformations is presented in Table 4.

Table 4

Pearson r Correlations between the Scales of Depression, Anxiety and Conduct Problems - After Transformation

	CDICT	CDIPT	PICD	STAIC	STAIP	PICA	CBCLCT	CBCLP
CDIPT	.36							
PICD	.31	.81						
STAIC	.51	.18	.21					
STAIP	.22	.72	.74	.13				
PICA	.23	.69	.82	.24	.77			
CBCLCT	.48	.17	.15	.46	.17	.10		
CBCLP	.30	.61	.58	.14	.40	.47	.32	
PICCT	.35	.55	.47	.16	.34	.27	.34	.76

Note. CDICT=Childhood Depression Inventory transformed (child form); CDIPT=Childhood Depression Inventory transformed(parent form); PICD=Personality Inventory for Children-Depression scale; STAIC=State-Trait Anxiety Inventory for Children-Trait scale (child form); STAIP=State-Trait Anxiety Inventory for Children-Trait scale (parent form); PICA=Personality Inventory for Children-Anxiety subscale; CBCLCT=Child Behaviour Checklist transformed-Aggression and Delinquent scales (child form); CBCLP= Child Behaviour Checklist-Aggression and Delinquent scales (parent form); PICCT=Personality Inventory for Children transformed-Delinquency subscale.

The variances of the scales were also transformed as CFA requires the variances to be of a similar scale of magnitude for successful estimation (Bentler, 1989). Table 5 shows the original standard deviation of the variables, the multiplicative constant used for transformation, and the resulting standard deviations used in the analyses. Such transformations have no effect on the values in the correlation matrix (Bentler, 1989).

Large sample size is required for the maximum likelihood estimation procedures of CFA. Although there is some disagreement over the smallest sample size that is acceptable, it is generally recommended that there be a minimum of four or five subjects for each parameter to be estimated in the model (Anderson & Gerbing, 1988; Loelin, 1987). The present analysis has 31 parameters to be estimated in the two-factor models and 29 parameters in the one-factor models. Thus, a sample size of 115 subjects falls nine subjects below the recommended guidelines of four subjects per parameter.

Testing the Two-Factor Model of Depression and Anxiety

A CFA was carried out on the transformed covariance matrix and a two-factor model of depression and anxiety (where depression and anxiety were specified as separate factors that were free to correlate). Table 6 presents the chi-square statistics and the goodness-of-fit indices for the two-factor model of depression and anxiety, as well as the

Table 5

Transformation of Standard Deviations Used in the Confirmatory Factor Analysis

	Initial SD	Multiplicative Constant	Transformed SD
CDICT	1.12		1.12
CDIPT	1.07		1.07
PICD	7.88	1/7	1.13
STAIC	7.40	1/7	1.07
STAIP	7.36	1/7	1.05
PICA	4.96	1/4	1.24
CBCLCT	1.22		1.22
CBCLP	12.40	1/12	1.03
PICCT	.69	2	1.40

Note. CDIC=Childhood Depression Inventory (child form); CDIP=Childhood Depression Inventory (parent form); PICD=Personality Inventory for Children-Depression scale; STAIC=State-Trait Anxiety Inventory for Children-Trait scale (child form); STAIP=State-Trait Anxiety Inventory for Children-Trait scale (parent form); PICA=Personality Inventory for Children-Anxiety subscale; CBCLC=Child Behaviour Checklist-Aggression and Delinquent scales (child form); CBCLP= Child Behaviour Checklist-Aggression and Delinquent scales (parent form); PICC=Personality Inventory for Children-Delinquency subscale.

Table 6

Comparison of Fit Between One- and Two-Factor Models

Model	df	χ^2	p	CFI
Depression and Anxiety				
One-factor model	16	20.00	.22	.99
Two-factor model	14	16.13	.30	1.00
Difference	2	3.87	ns[a]	
Depression and Conduct Problems				
One-factor model	16	30.49	.02*	.98
Two-factor model	14	16.13	.30	1.00
Difference	2	14.36	.01*	

Note. CFI=comparative fit index. N=115.

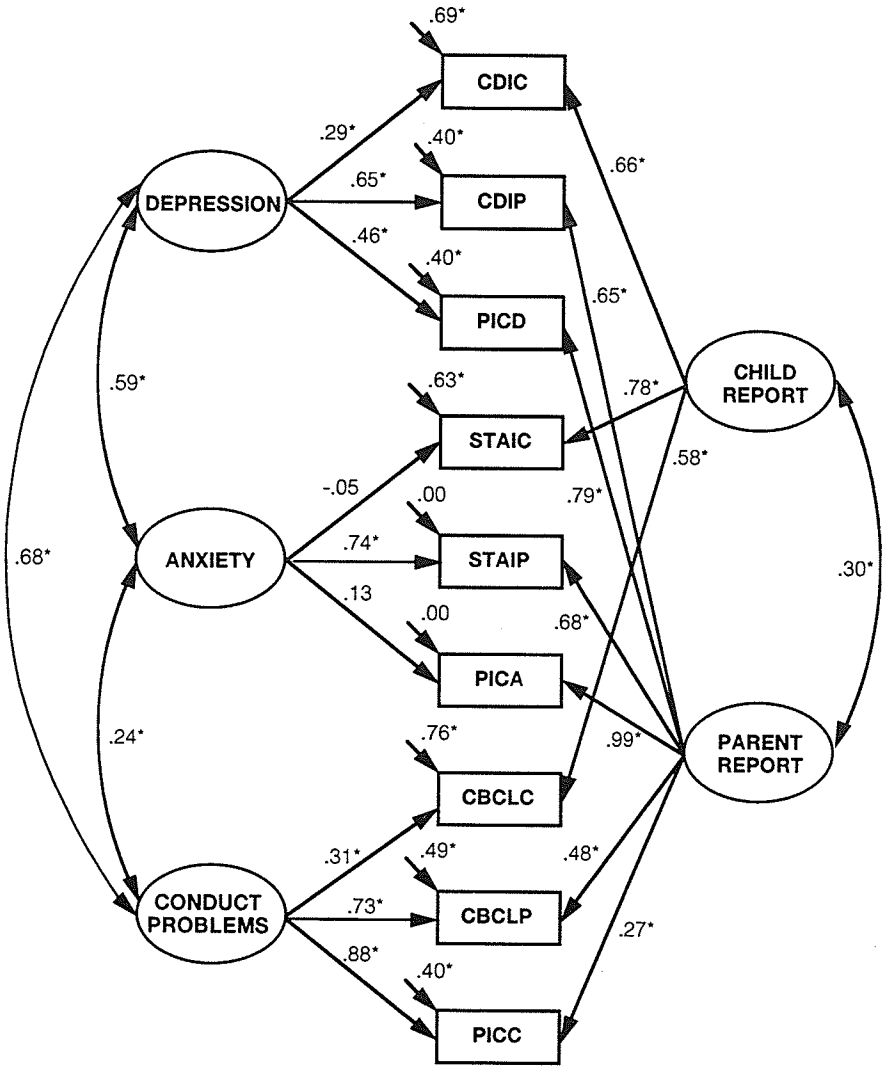
[a] < critical value of 5.99.

* p < .05.

other models tested. Figure 2 pictorially represents the two-factor model of depression and anxiety (and of depression and conduct problems). This model is the least restrictive model to which all other models are compared.

The chi-square test evaluates how much the covariance matrix generated from theory differs significantly from the observed covariance matrix (Mulaik, 1986). A good-fitting model is associated with a nonsignificant chi-square indicating that the difference between the observed covariance matrix and the matrix generated by the theoretical model is not significant. The chi-square statistic for the two-factor model of depression and anxiety was nonsignificant, $\chi^2(14, \underline{N} = 115) = 16.13$, $\underline{p} = .30$, suggesting a good-fitting model.

Since the chi-square statistic is dependent on sample size, a number of goodness-of fit indices have been developed to take sample size and degrees of freedom into account. These indices are commonly referred to as practical indices of fit, being descriptive rather than inferential in nature (Byrne, 1994). Bentler (1992) recommends the comparative fit index, the CFI, as the practical index of choice. Values for the CFI range from 0 to 1, with higher values indicating better fit: A CFI of .90 or greater indicates an acceptable fit of the model to the data (Bentler, 1992). Thus, a CFI of 1.00 in the two-factor model of depression and anxiety



CDIC = Childhood Depression Inventory (child form);
CDIP = Childhood Depression Inventory (parent form);
PICD = Personality Inventory for Children - Depression scale;
STAIC = State-Trait Anxiety Inventory for Children - Trait scale (child form);
STAIP = State-Trait Anxiety Inventory for Children - Trait scale (parent form);
PICA = Personality Inventory for Children - Anxiety subscale;
CBCLC = Child Behaviour Checklist - Aggression and Delinquent scales (child form);
CBCLP = Child Behaviour Checklist - Aggression and Delinquent scales (parent form);
PICC = Personality Inventory for Children-Delinquency subscale.

Figure 2. Confirmatory factor analysis of the one-factor model of depression and anxiety, and depression and conduct problems.

Statistically significant, $p < .05$.

supports the nonsignificant chi-square in indicating a good-fitting model.

Figure 2 displays the relationships of the indicators to the latent variables and the relationships of the latent variables to each other. The arrows from the latent variables to the measures indicate the factor loadings (i.e., the extent to which the factor or underlying latent construct contributes to the variability of the measure). Each observed measure, then, is made up of variance due to the psychopathological construct (i.e., depression, anxiety, and conduct problems); variance due to the type of reporting method (i.e., child and parent); and variance that is unaccounted for in the measure, commonly referred to as unique variance or error variance. The EQS program tests factor loadings to determine if the parameter is significantly different from zero. Thus, measures that adequately assess the latent constructs can be identified. In multitrait-multimethod language, this is the same as assessing the convergent validity of the measures onto their corresponding trait factor.

The factor loadings in Figure 2 have been reorganized in Table 7 to facilitate the comparison of factor loadings in the two-factor model of depression and anxiety. As one can see from Figure 2 or Table 7, seven of the nine measures have significant factor loadings on their corresponding trait

Table 7.

Trait and Method Loadings of the Two-Factor Model of Depression and Anxiety and Depression and Conduct Problems

	Trait			Method
	Dep	Anx	CP	CR	PR
Child Ratings (CR)					
CDIC	.29*			.69*	
STAIC		-.05		.63*	
CBCLC			.31*	.76*	
Parent Ratings (PR)					
CDIP	.65*				.40*
PICD	.46*				.40*
STAIP		.74*			.00*
PICA		.13			.00*
CBCLP			.73*		.49*
PICC			.88*		.40*

Note. Dep=Depression; Anx=Anxiety; Conduct Problems=CP; CR=Child Ratings; PR=Parent Ratings; CDIC=Childhood Depression Inventory (child form); CDIP=Childhood Depression Inventory (parent form); PICD=Personality Inventory for Children-Depression scale; STAIC=State-Trait Anxiety Inventory for Children-Trait scale (child form); STAIP=State-Trait Anxiety Inventory for Children-Trait scale (parent form); PICA=Personality Inventory for Children-Anxiety

Table 7 continued

subscale; CBCLC=Child Behaviour Checklist-Aggression and Delinquent scales (child form); CBCLP= Child Behaviour Checklist-Aggression and Delinquent scales (parent form); PICC=Personality Inventory for Children-Delinquency subscale.

* $p < .05$.

factor. Examining each factor separately, all three measuresof depression have significant factor loadings, all three measures of conduct problems have significant factor loadings, but only one measure of anxiety is significant. This suggests that the constructs of depression and conduct problems have adequate measures but that anxiety does not, having only one good indicator of the construct. Comparing the size of the factor loadings across psychopathological constructs, it is also apparent that conduct problems is a well measured construct, that depression is modestly to moderately well measured, and that anxiety is poorly measured. Comparing the size of the children's factor loadings to the parents', it is also apparent that the children's measures less adequately measure the psychopathological constructs than the parents' measures in all three constructs (e.g., the children's measure of depression is .29, compared to .65 and .46 in the parents' measures). Taken together, these results suggest adequate convergent validity for measures of conduct problems and depression but not for anxiety, and adequate convergent

validity for the parents' measures but not the children's measures.

As one can see from Figure 2 or Table 7, all factor loadings for method variance are significant, suggesting that it plays an important role in the measurement process. If one compares the factor loadings for method variance to those of the psychopathological constructs, one can see that the method variance accounts for a larger proportion of the variance than the psychological constructs in five of the nine measures. In particular, the method variance exceeds the trait variance in all of the children's measures. For the model as whole, then, there is slight tendency for method effects to attenuate trait effects, particularly in the children's measures.

To determine the importance of method variance in the model, a CFA was carried out on the two-factor model deleting the two method factors (in other words, deleting the right-hand portion of the diagram in Figure 2). A $\chi^2(24, \underline{N} = 115) = 112.95$, $\underline{p} < .001$, CFI = .86, was obtained. A significant chi-square with a poor practical goodness-of-fit indice indicates that the model without method variance is lacking in fit and should be rejected. Thus, method variance, or differentiating between child and parent report, is an essential construct in the measurement of depression, anxiety, and conduct problems.

A breakdown of the variance of the measures (i.e., variance due to depression, due to the method, due to the error) is also informative. Analogous to the squared multiple correlation in regression, (1 - R^2 or the error variance) yields the proportion of variance accounted for in the measure. For example, in the child measure of depression (the first box in Figure 2) the error variance of .69 leaves 48% of the measure unaccounted for, and 52% accounted for by the psychopathological construct and the method. In this example, 8% is accounted for by the psychopathological construct and 44% by the method variance. For the children's measure of depression, then, measurement of the psychopathological construct contributes significantly to the measure but in a relatively minor way when comparing it to the method variance. As such, calculating R^2 values reinforces what is observed in the factor loadings.

As one can see in Figure 2, two of the error terms on the parents' measures of anxiety (STAIC, PICA) are constrained to zero by the EQS program. Dr. Peter Bentler, developer of the EQS program, indicated in a personal communication (Sept., 1994) that such a constraint occurs when there are not enough good indicators of a factor, which is certainly true of anxiety, since only one of the three measures loaded significantly on that factor. An alternative method (of dividing the best measure of anxiety into two scales of odds and evens) rid the program of the constraints,

but it was decided against since it lacked substantive meaning (Byrne, 1994). As a matter of interest, this program yielded one estimate of error for PICA = .01 which was nonsignificant at $p < .05$ and two estimates of error for STAIP: STAIPEVEN = .57 which was significant at $p < .05$ and STAIPODD = .06 which was nonsignificant. A more subjective way to estimate the two error terms is to look at other values in the diagram: the error term for STAIP is likely to fall within the .4 to .5 range since it is the only good indicator of anxiety, and the error term for PICA is likely to fall within the .6 to .7 range since it is similar to STAIC in being a poor indicator of anxiety. Although an attempt was made to approximate the error terms, Dr. Bentler also indicated that the results are reliable and interpretable despite the constraints.

Discriminant validity can be evaluated by examining the correlations between the psychopathological constructs. The covariation between the constructs is tested for significance with the null hypothesis that the estimated correlation equals zero. As one can observe in Figure 2, the correlations between depression and anxiety (.59), depression and conduct problems (.68), and anxiety and conduct problems (.24) are all significant at $p < .05$. The magnitude of the correlations between depression and anxiety and depression and conduct problems indicates that there is some overlap between the constructs but that the constructs are somewhat

discriminable. The shared variance is .35 for the constructs of depression and anxiety which leaves a unique variance of .65 for each of the constructs. The shared variance is .46 for the constructs of depression and conduct problems which leaves a unique variance of .54 for each of the constructs.

The difference between the two correlations of depression and anxiety and depression and conduct problems was evaluated using Fisher Z transformations (Morrison, 1983). No significant difference was found between the two correlations, $z = 1.13$, $p > .05$, suggesting that the correlations between depression and anxiety and depression and conduct problems are of similar magnitude.

The correlation of .30 between the child and parent method factors is also significant and suggests high discriminability between the two raters. Correlated t-tests were carried out to determine if there were any differences between parent and child ratings on the three scales which both the children and the parents completed. As can be seen in Table 8, all three t-tests were significant at an adjusted Bon Ferroni level of $p < .016$. As can be seen in Table 8, the direction of the differences was such that parental ratings exceeded child ratings on all scales. This suggests that parents rated their children as having more severe symptomatology than the children rated themselves.

Table 8

t tests of Parent-child differences for the Scales of Depression Anxiety and Conduct Problems

		Mean	t Value	p Value
CDI	Child	8.48	5.31	.00**
	Parent	12.52		
STAI	Child	36.01	2.37	.02**
	Parent	38.16		
CBCL	Child	14.70	5.98	.00**
	Parent	21.78		

Note. N=115. CDI=Childhood Depression Inventory; STAI=State-Trait Anxiety Inventory-Trait scale; CBCL= Child Behaviour Checklist-Aggression and Delinquent scales.

* $p < .05$.

** adjusted $p < .016$.

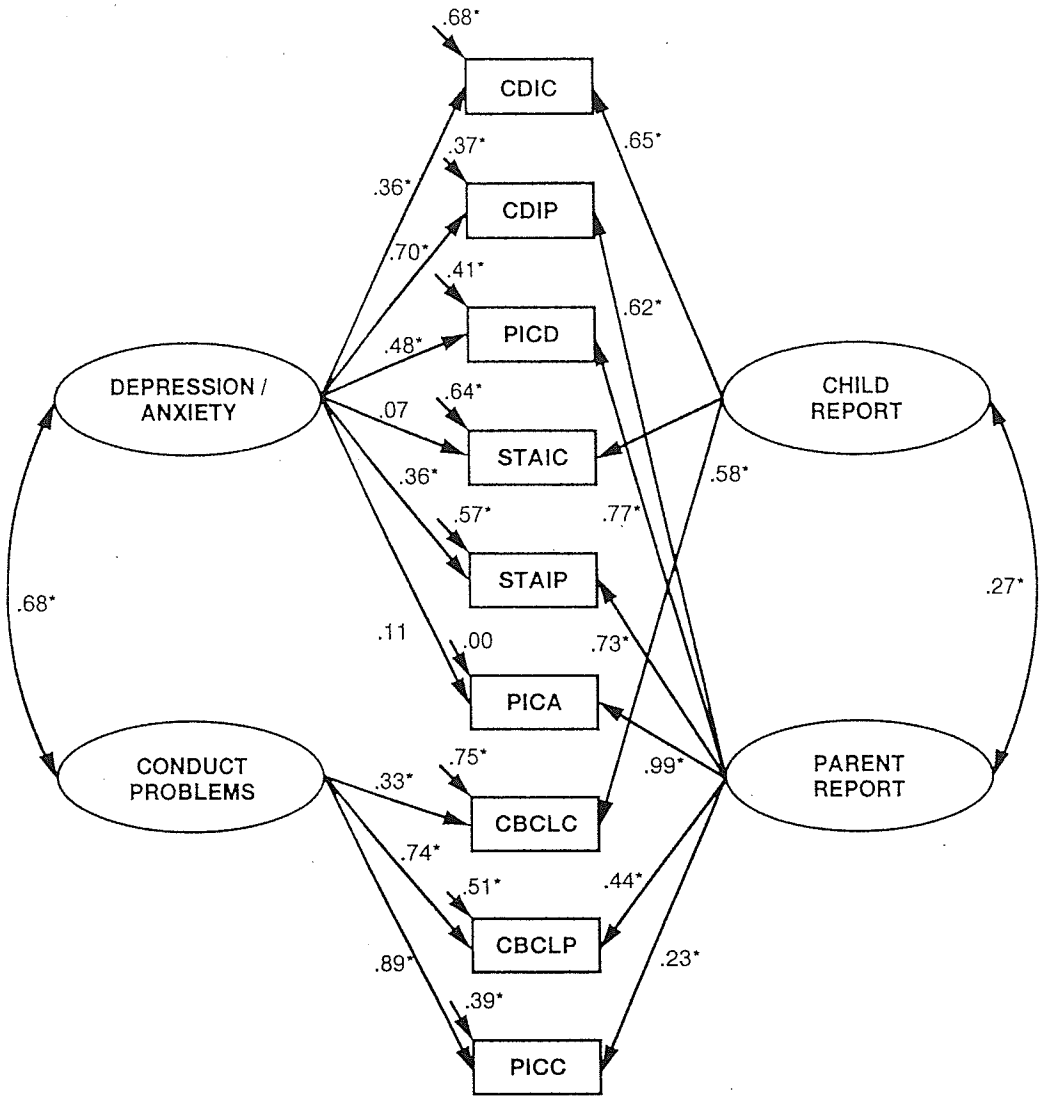
Testing the One-Factor Model of Depression and Anxiety

The one-factor model of depression and anxiety is nested or is a subset of the two factor model (i.e., the covariation between depression and anxiety is freely estimated in the two factor model but is fixed to zero in the one-factor model). The chi-square and practical goodness-of-fit indice for the one-factor model of depression and anxiety are presented in

Table 6. A $\chi^2(16, \underline{N} = 115) = 20.00$, $p = .22$, and a CFI = .99, suggests that a one-factor model of depression and anxiety where all depression and anxiety indicators load one factor is a good-fitting model.

The factor loadings and correlations for the one-factor model of depression and anxiety are presented in Figure 3. All the factor loadings that formerly loaded on depression are significant and are generally similar in value to the two-factor model. All the measures that formerly loaded on the anxiety factor in the two-factor model (although only one was significant) are nonsignificant in the one-factor model. This suggests that although there is a single factor for depression and anxiety, that the depression measures tap into this factor whereas the anxiety measures do not. All the factor loadings for conduct problems were significant and generally similar in value to the two-factor model. Thus, one of the major findings is the poor loading of all anxiety measures in this model.

As one can see from Figure 3, the correlation between the combined depression and anxiety factor and the conduct problem factor is .68 and was significantly different from zero. The correlation between parent and child methods equalled .27 and was nonsignificant.



CDIC = Childhood Depression Inventory (child form);
CDIP = Childhood Depression Inventory (parent form);
PICD = Personality Inventory for Children - Depression scale;
STAIC = State-Trait Anxiety Inventory for Children - Trait scale (child form);
STAIP = State-Trait Anxiety Inventory for Children - Trait scale (parent form);
PICA = Personality Inventory for Children - Anxiety subscale;
CBCLC = Child Behaviour Checklist - Aggression and Delinquent scales (child form);
CBCLP = Child Behaviour Checklist - Aggression and Delinquent scales (parent form);
PICC = Personality Inventory for Children-Delinquency subscale.

Figure 3. Confirmatory factor analysis of the one-factor model of depression and anxiety.

Statistically significant, $p < .05$.

Comparison of the One- and Two-Factor Models of Depression and Anxiety

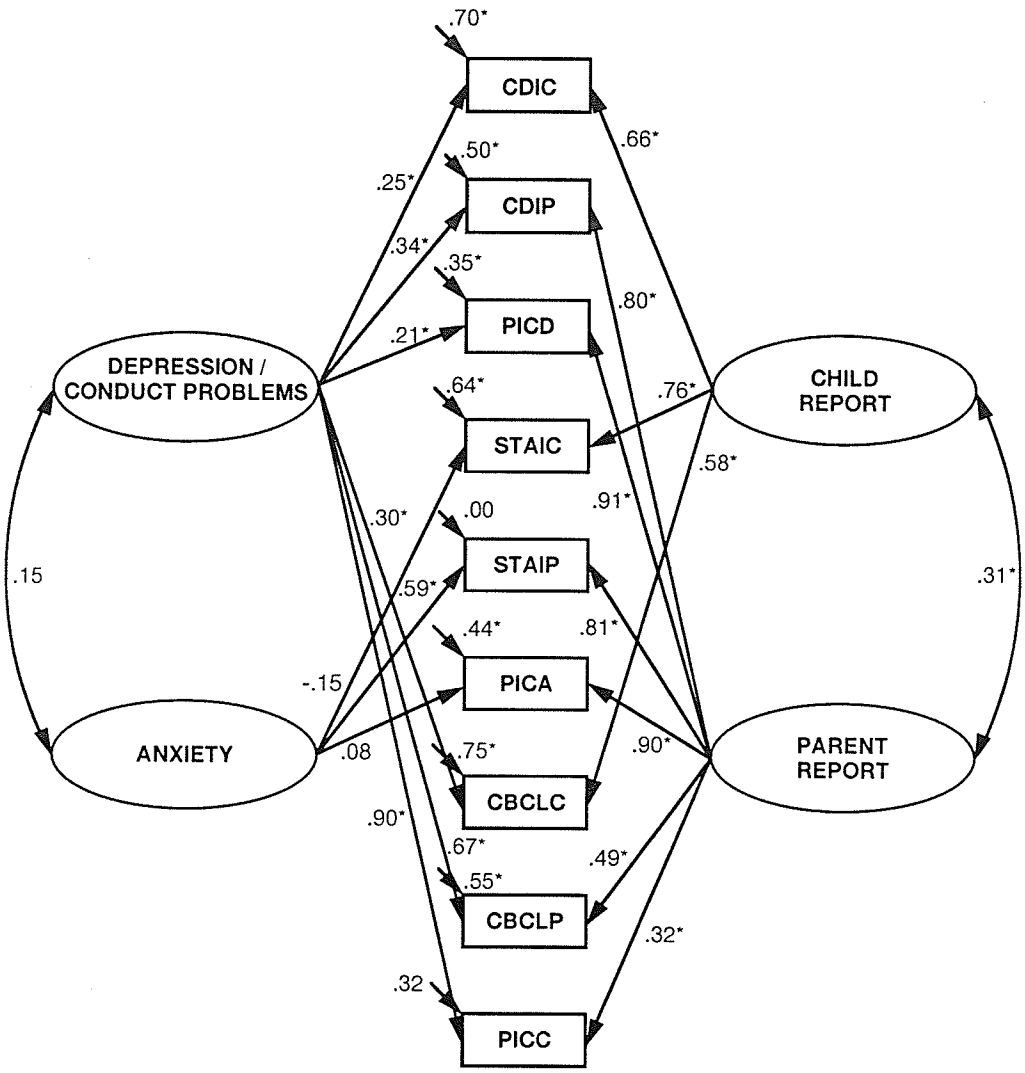
It is possible when the models are nested to determine whether the two-factor model fits the data better than a one-factor model by testing the difference between the chi-square statistics (Loehlin, 1987). The results of the chi-square difference test are presented in Table 6. The chi-square difference statistic, $\chi^2_{diff}(2, N = 115) = 3.87$, was not significant at $p < .05$, suggesting that the one-factor model fit did not fit the data any better or worse than the two-factor model. In other words, the one- and two-factor models were both good-fitting models that fit the data equally well.

Testing and Comparison of the One- and Two-Factor Models of Depression and Conduct Problems

One- and two-factor models of depression and conduct problems were evaluated, mainly to compare the results to those of the one- and two-factor models of depression and anxiety, as there is little controversy over the distinction between depression and conduct problems. Figure 2 presents the results of the standard two-factor model, whether it be depression and anxiety or depression and conduct problems. The tests of overall goodness-of-fit, the factor loadings and the correlations are the same as the two-factor model of depression and anxiety which has been discussed previously. To review, briefly, the chi-square statistic of the two-

factor model of depression and conduct problems is nonsignificant and suggests a good-fitting model for depression and conduct problems as distinct factors. The correlation between depression and conduct problems (.68) was significant, and the factor loadings for depression and conduct problems were all significant. Taken together, this suggests that depression and conduct problems are highly correlated and that they are well-measured, although as one can see from Figure 2, conduct problems is better measured than depression.

Figure 4 presents the results of the one-factor model of depression and conduct problems. Although it is important to use multiple indices in assessing the fit of models, in this case there is a discrepancy between the two goodness-of-fit indices. The chi-square statistic, $\chi^2(16, \underline{N} = 115) = 30.49$, $\underline{p} = .02$, is significant, suggesting a poor-fitting model, but the CFI = .98 suggests a good-fitting model. In the previous models and the present model, the CFI, the practical goodness of fit indice, does not differentiate between models. Based solely on the CFI, all models would be judged as having an acceptable fit. With the chi-square, however, some differentiation between models is possible. As such, the chi-square statistic is preferred to the CFI if a choice has to be made between the two. Also, although sensitivity to sample size is an issue with the chi-square, previous models with the same sample size were not rejected,



CDIC = Childhood Depression Inventory (child form);
CDIP = Childhood Depression Inventory (parent form);
PICD = Personality Inventory for Children - Depression scale;
STAIC = State-Trait Anxiety Inventory for Children - Trait scale (child form);
STAIP = State-Trait Anxiety Inventory for Children - Trait scale (parent form);
PICA = Personality Inventory for Children - Anxiety subscale;
CBCLC = Child Behaviour Checklist - Aggression and Delinquent scales (child form);
CBCLP = Child Behaviour Checklist - Aggression and Delinquent scales (parent form);
PICC = Personality Inventory for Children-Delinquency subscale.

Figure 4. Confirmatory factor analysis of the one-factor model of depression and conduct problems.

Statistically significant, $p < .05$.

although the one-factor model of depression and conduct problems was rejected. This shows that the sample size is sufficient to reject or not to reject the different models. The results, then, are interpreted as disconfirming the one-factor model of depression and conduct problems.

The one- and two-factor model of depression and conduct problems is compared directly in a chi-square difference test. Table 6 shows the results of this test. The chi-square difference test, $\chi^2(2, \underline{N} = 115) = 14.36$, is significant at $\underline{p} < .05$. This suggests that there is a significant difference between the two models, favouring the two-factor model of depression and conduct problems as a significantly better fitting model than the one-factor model.

Additional Tests of Construct Validity

Following procedures outlined by Byrne (1994), the least restrictive multitrait-multimethod model is compared to a nested series of models, with the chi-square difference test providing the means to evaluate convergent and discriminant validity. The comparisons were carried out at the overall model level as convergent and discriminant validity have already been evaluated at the individual parameter level (i.e., the comparison of factor loadings and correlations in the two-factor model). Table 9 presents goodness-of-fit statistics for the four multitrait-multimethod models that were evaluated, and Table 10 presents the results of the model comparisons.

Table 9

Summary of Goodness-of-Fit Indices for the Multitrait-Multimethod Models

Model	χ^2	df	p	CFI
1. Freely correlated traits; Freely correlated methods	16.13	14	.28	1.00
2. No traits; Freely correlated methods	141.24	26	.001*	.82
3. Perfectly Correlated traits Freely Correlated methods	32.99	17	.01*	.98
4. Freely correlated traits; Perfectly correlated methods	41.74	15	.001*	.96

Note. N=115. CFI=comparative fit index.

* $p < .05$.

Table 10

Differential Goodness-of-Fit Indices for Multitrait-Multimethod Model Comparisons

Model Comparisons	Difference in χ^2	df	CFI
Test of Convergent Validity			
Model 1 vs. Model 2 (traits)	125.11*	12	.18
Test of Discriminant Validity			
Model 1 vs. Model 3 (traits)	16.86*	3	.02
Model 1 vs Model 4 (methods)	25.61*	1	.04

Note. CFI=comparative fit index.

* $p < .05$.

Testing for Convergent Validity. Evidence of convergent validity can be tested by comparing a model in which traits are specified to a model in which they are not specified (Byrne, 1994). Such a comparison evaluates the extent to which independent measures of the same trait are correlated (i.e., child and parent report) (Byrne, 1994; Campbell & Fiske, 1959)

The baseline model for comparison is the two-factor model of depression and anxiety (and depression and conduct problems). This model has freely correlated traits and

freely correlated methods and is identified as Model 1 in Table 9.

In Model 2, all trait factors have been deleted from the program but method factors remain freely correlated. As can be seen in Table 9, this model has a very large, significant chi-square and a CFI less than .90, indicating a poor-fitting model.

As can be seen in Table 10, a comparison of Model 1 and 2 (where traits are specified and where they are not), yields a large and significant chi-square statistic. This significant difference in chi-square provides evidence for convergent validity of the trait factors.

Testing for Discriminant Validity of Traits. Evidence for discriminant validity of traits can be tested by comparing a model in which traits correlate freely (Model 1) with a model in which traits are perfectly correlated (Model 3) (Byrne, 1994). Table 9 presents the results of a confirmatory factor analysis of Model 3 in which the covariation between the traits is set to one. The results indicate some discrepancy in fit between the chi-square statistic and the practical goodness of fit indice: The chi-square is significant at $p < .05$ suggesting a poor-fitting model, but a CFI = .96 indicates a good-fitting model. Similar to the last occurrence of such a discrepancy, the chi-square is the goodness-of-fit indice which is used.

As can be seen in Table 10, a comparison of Model 1 and 3 (where traits are freely correlated and where they are perfectly correlated), yields a significant chi-square difference statistic. The larger the chi-square difference statistic and the change in CFI values, the more support there is for evidence of discriminant validity among traits (Byrne, 1994). There is moderate support for discriminant validity among traits, here, because there is a significant difference in chi-square but the change in the CFI is small.

Testing for Discriminant Validity of Method Effects. Evidence for discriminant of method effects is evaluated by comparing a model in which the method factors are freely correlated (Model 1) with a model in which the method factors are perfectly correlated (Model 4) (Byrne, 1994).

Table 9 presents the results of the CFA of Model 4 in which the covariation between the method factors is set to one. The chi-square difference is significant at $p < .05$, indicating a poor-fitting model, but again there is a discrepancy in goodness-of-fit indices because of a good-fitting CFI.

A comparison of Model 1 and 4 (where the method effects are freely correlated and where they are perfectly correlated) yielded a significant chi-square statistic and a moderate change in CFI values. A significant chi-square value and a substantial change in CFI argues for evidence of discriminant validity among methods. Comparing the

discriminability among traits and the discriminability among methods, it is concluded that the discriminant validity among methods is stronger than that for traits. This conclusion is similar to the conclusions reached in a previous section where the size of factor loadings and correlations for the traits and methods was compared.

Discussion

The present study was designed to evaluate the relationships between depression, anxiety, and conduct problems in children. Although there have been a number of studies examining the relations between depression and anxiety in children (and to a lesser extent the relations between depression and conduct problems) no studies have evaluated these relations through the methodology of confirmatory factor analysis. The strength of confirmatory factor analysis is that competing theories can be specified, tested and compared to determine which theoretical model best fits the data. There has been considerable controversy over the relationship between depression and anxiety in children with two views emerging: One view is that depression and anxiety are distinct but interrelated syndromes, and the other view is that anxiety and depression are aspects of one syndrome, commonly referred to as internalizing problems or negative affectivity. The present study draws on previous research to compare these two competing views of depression and anxiety. The relationship between depression and another construct, conduct problems, was also studied to compare it to the relationship between depression and anxiety. Two competing models of depression and conduct problems are compared: One in which depression and conduct problems are regarded as separate constructs and one in which they are regarded as a single construct.

The following discussion will focus on the major findings of the study relevant to each hypothesis, articulated within the context of the current literature. This will be followed by a discussion of issues raised by the results, including a discussion of the measures, parent and child report, and the limitations of the study. The implications of the findings for clinical practice and future research will also be addressed.

The Relationship Between Childhood Depression and Anxiety, Hypotheses 1, 2, and 3

Hypothesis 1 states that depression and anxiety are distinct but covarying syndromes, as specified by a two-factor model of depression and anxiety. Testing of the two-factor model revealed that it fit the data well, suggesting that it is a plausible model of depression and anxiety in children. Testing also revealed that depression and anxiety are two highly correlated constructs, with a factor correlation of .59.

Historically, the two-factor model of depression and anxiety has been the most influential model as it has been incorporated into DSM and thus widely used in research and in clinical practice. Following the lead of research with adults, a growing number of studies have questioned the two-factor model of depression and anxiety in children (Achenbach & Edelbrock, 1978; Quay, 1986a; Eason et al., 1985; Ollendick & Yule, 1991; Wolfe et al., 1987). At the present time,

research tends to favour the one-factor model of depression and anxiety over the two-factor model (see Finch et al., 1989; Ollendick & Gullone, 1991, for reviews).

There is, however, empirical support for the two-factor model. Although diagnostic studies show a high comorbidity rate of 25 to 50% for childhood depression and anxiety, the other side of the same coin is that 50 to 75% of the cases of depression or anxiety are not diagnosed together. It is evident from many diagnostic studies that depression and anxiety disorder can each be diagnosed separately (Berstein, 1991; Hodges, 1990; Kovacs et al., 1989; Stavrakaki et al., 1987; Strauss et al., 1988). Indeed, agreement with regard to diagnosis has improved with the use of diagnostic criteria and more structured interviews (Last et al., 1987). In addition to children who have been diagnosed with either depression or anxiety, a number of studies have identified a third group of children who can be diagnosed with both depression and anxiety (Bernstein, 1991; Kovacs et al., 1989; Strauss et al., 1988). The fact that a group of children with mixed depression and anxiety can be identified does not, however, negate the diagnosis of depression and anxiety as separate syndromes.

Some diagnostic studies have delved deeper into the relationship between depression and anxiety than simple comorbidity (Bernstein, 1991; Kovacs et al., 1989; Strauss, et al., 1988). For the most part, these studies have shown

patterns which distinguish depression, anxiety and mixed depression-anxiety. For example, children diagnosed with both depression and anxiety have consistently shown more severe symptoms than children diagnosed with either depression or anxiety alone. Also, with comorbid depression and anxiety, the onset of anxiety has been shown to precede the onset of depression and often to persist after the depression has remitted. Research which shows such differential patterns in onset, in presenting problems, in clinical course, and in treatment and recovery, supports the view of depression and anxiety as distinct syndromes.

Hypothesis 2 states that depression and anxiety cannot be differentiated in children, as specified by a one-factor model of depression and anxiety. Testing of the one-factor model revealed that it also fit the data well, suggesting that it too is a plausible model of depression and anxiety in children.

The fact that a model fits the data well (as does the two-factor model) does not mean that another model (the one-factor model) cannot fit the data equally well. Indeed, one of the basic tenets of structural equation modeling is that alternative models must be examined since these models may also explain the data (Loehlin, 1987). In the present study, the two-factor model and the one-factor model are both plausible explanations of the data.

Research has yielded at least two major theoretical positions that are consistent with the one-factor model of depression and anxiety. The one-factor model is often referred to as internalizing problems in the child literature, and as negative affectivity in the adult and child literature. Other less well-used terms are neuroticism or global psychological distress. The construct of internalizing problems has developed from the work of Achenbach and his colleagues (1978, 1983, 1989) who used multivariate statistical techniques to empirically derive children's syndromes. The construct of internalizing problems incorporates such symptoms as depression, anxiety, somatic complaints, and social withdrawal. The construct of negative affectivity has developed from Watson and Clark's (1984) early work with adults. It incorporates symptoms of anxiety, depression and neuroticism as assessed by self-report measures. Although keeping the broader construct of negative affectivity, Clark & Watson's (1991) later work differentiates depression and anxiety on the basis of low positive affect and high physiological arousal. Researchers in the child literature seem to have adopted the construct of negative affectivity from Watson and Clark's early work while ignoring their later work that differentiates depression and anxiety.

In support of the one-factor model, many studies have shown considerable overlap between diagnoses of depression

and anxiety (Bernstein, 1991; Bernstein & Garfinkel, 1986; Kovacs et al., 1989; Strauss et al., 1988). It has been argued that depression and anxiety overlap to such an extent that a common disorder exists.

There is also considerable overlap in symptoms of depression and anxiety, to the extent that one set of authors remarked that "it was often very difficult to separate the symptoms of anxiety and depression and to determine which disorder was primary and which was secondary" (Bernstein et al., 1986, p. 240). The overlap of symptoms may reflect overlapping constructs or it may also reflect overlapping item content between depression and anxiety scales. Indeed, a well-known measure of psychopathology used in the present study, the Personality Inventory for Children, has as many as 14 of 28 overlapping items between scales of depression and anxiety. To deal with the problem of overlapping content, some assessment studies have rid their depression and anxiety scales of overlapping items (e.g., Stavrakaki et al., 1987). Thus, pure depression and pure anxiety scales are created, but one questions whether the resulting scales truly reflect the constructs of depression and anxiety.

The greatest support for the one-factor model has been assessment studies which use rating scales to assess depression and anxiety. These studies consistently find high correlations (*rs* ranging from .50 and .64) between measures of depression and anxiety (Eason et al., 1985; Ollendick &

Yule, 1991). These authors conclude from these high correlations that depression and anxiety measures assess one broad construct such as negative affectivity. Although high correlations indicate a strong degree of association between depression and anxiety, this does not necessarily mean that depression and anxiety are identical. In the present study, the results of the confirmatory factor analysis of the one-factor model do indicate that depression and anxiety can be combined into one construct.

The strongest test of discriminant validity is the multitrait-multimethod design (Byrne, 1994; Campbell & Fiske, 1959). The few studies that have employed this design have found a lack of discriminant validity between measures of depression and anxiety (Saylor et al., 1984b; Wolfe et al., 1987). Support for the one-factor model in the present study indicates weak discriminant validity since logically the two constructs are one and no discrimination is possible. On the other hand, support for the two-factor model indicates adequate discriminant validity since depression and anxiety are distinguished as two separate syndromes. Since competing models were both supported in the present study, a separate series of confirmatory factor analyses were carried out which specifically examined the convergent and discriminant validity of the measures. These results suggest that good convergent validity was attenuated by strong method variance (i.e., between parent and child). They also suggest that

discriminant validity was weaker than convergent validity, overall, or alternatively, that discriminant validity varied from good to poor depending upon the traits assessed. Thus, there is good discriminant validity for depression and conduct problems but not for depression and anxiety.

Hypothesis 3 states that when the one- and two-factor models are compared, that one model would fit the data significantly better than the other model. No prediction was made as to which would be the better fitting model, since the literature showed evidence in support of both models. It was expected, however, that the comparison of the models would yield one model that fit the data significantly better than the other model. This was not case, however, the difference between the one- and two-factor models was not significant, indicating that both models fit the data equally well.

In the applied structural equation modeling literature when two competing models are found to be equally as good a fit, the choice between them is often made on the basis of parsimony: the model which has the fewest number of parameters is judged to be the more representative model (Feldman, 1993). Applying this method of decision-making to the present study, the one-factor model would be judged as the more representative model of the relations between depression and anxiety.

There is a reluctance on my part to use the rationale of parsimony to make a decision between the two well-fitting

models of depression and anxiety in the present study. If there were a number of parameters distinguishing the one- and two-factor models, it would seem more justifiable to reject a more complicated model in favour of a simpler model. In the present study, however, there are only two fewer parameters in the one-factor model than the two-factor model. It would seem to distort the findings of the study, to select the one-factor model over the two-factor model on the basis of only two fewer parameters. The results showed that both models fit the data equally well, and this would seem to be the most accurate representation of the findings of the study.

Also, although the difference between the one-factor model and the two-factor models was nonsignificant, the direction of the trend was towards supporting the two-factor model. Although one does not know how much credence to attach to such findings, it is doubly difficult to choose a one-factor model on the basis of two fewer parameters, when the trend is towards the two-factor model.

The results do not definitively resolve the question of whether depression and anxiety are the same or distinct syndromes. Although there has been a good deal of controversy over the question, this is one of the first studies that actually tests different theoretical models of depression and anxiety in children. Rather than seek premature closure, it would seem better to accept the results

as they stand: that both models are viable options at this point in time.

The results of the present study are reminiscent of Clark and Watson's (1991) tripartite model of depression and anxiety. Their model functions on two levels: on one level depression and anxiety are subsumed under a broader category of negative affectivity, and on another level depression and anxiety are differentiated. The results of the present study can be cast in a similar manner: on one level depression and anxiety are combined into one broader construct (i.e., the one-factor model), and on another level depression and anxiety are differentiated (i.e., the two-factor model).

The Relationship between Depression and Conduct Problems, Hypotheses 4, 5, and 6

Hypothesis 4 represents the two-factor model of depression and conduct problems. It states that childhood depression and conduct problems are separate but covarying syndromes. Consistent with prediction, the results revealed that the two-factor model fit the data well, suggesting that it is a plausible model of depression and conduct problems in children. Testing also revealed that depression and conduct problems are two highly related constructs, with a factor correlation of .68.

Hypothesis 5 represents the one-factor model of depression and conduct problems. It states that childhood depression and conduct problems are one syndrome. Consistent

with prediction the one-factor model was disconfirmed, suggesting that it is not a plausible model of depression and conduct problems in children.

Hypothesis 6 represents the comparison between the one- and two-factor model of depression and conduct problems. Consistent with prediction and the results pertaining to the two previous hypotheses, the comparison revealed that the two-factor model of childhood depression and conduct problems fit the data significantly better than the one-factor model.

The finding that depression and conduct problems are better represented as two separate but covarying syndromes was expected in light of the literature. Diagnostic studies examining the relationship between childhood depression and conduct disorder have generally found that the two syndromes can each be diagnosed separately (Carlson & Cantwell, 1980b; Kovacs et al., 1988; Marriage et al., 1986; Puig-Antich, 1982). Prior to the recognition of childhood depression in DSM-III in 1980, there was considerable debate over the role that behavioural problems played in childhood depression. This was reflected in the concept of masked depression in which behavioural problems were believed to mask underlying depression. This concept, however, was found not to be empirically sound nor clinically useful (Carlson & Cantwell, 1980b). The development of diagnostic criteria for childhood depression and the recognition of behavioural problems as associated features of childhood depression seem to have

resolved the problems in diagnosing concurrent depression and conduct disorder (Carlson & Cantwell, 1980b). Decision rules such as using multiple nonhierarchical diagnoses have also aided the diagnosis of concurrent depression and conduct problems. The development and use of behavioural rating scales, such as the Child Behaviour Checklist (Achenbach & Edelbrock, 1978), have also contributed to the discrimination of behavioural syndromes such as conduct disorder.

In addition to the support for the two-factor model of depression and conduct problems, the magnitude of the correlation between the factors of depression and conduct problems is noteworthy. The correlation of .68 indicates that there is some overlap between the constructs (i.e., a shared variance of .44) but that the constructs are also discriminable (i.e., unique variance of .66). The magnitude of this correlation is similar to that of the only other confirmatory factor analytic study to examine the relationship between depression and conduct problems in children. Cole and Carpentieri (1990) found a correlation of .73 between the factors of depression and conduct problems.

In the present study, the strength of the relationship between depression and conduct problems can be assessed by comparing it to the strength of the relationship between depression and anxiety. The results revealed that there was no significant difference between the factor correlation of depression and conduct problems ($\underline{r}$ = .68) and the factor

correlation of depression and anxiety (r = .59). In other words, the relationship between depression and conduct problems was as strong as the relationship between depression and anxiety. This finding is in contrast to the literature which has generally found a stronger relationship between depression and anxiety than depression and conduct problems. There has been little research directly examining the relationship between all three syndromes although various combinations have been studied. Research has found that the most likely concurrent disorder of depression is anxiety disorder (Kovacs et al., 1984). While the comorbidity rate for depression and anxiety ranges between 25 to 50%, the comorbidity rate for depression and conduct problems is lower, ranging from 7 to 33% (Bernstein, 1991; Bernstein & Garfinkel, 1986; Carlson & Cantwell, 1980b; Kovacs et al., 1984, 1988, 1989; Marriage et al., 1986; Puig-Antich, 1982; Strauss et al., 1988). Rather than diagnosis, this study used self-report measures to assess the constructs of depression, anxiety, and conduct problems. Similar to the results of diagnostic studies, the few assessment studies that have examined all three constructs have shown higher correlations for measures of depression and anxiety than for measures of depression and behavioural problems (Matson & Nieminen, 1987; Wolfe et al., 1987).

There are two possible explanations for the similar correlations between the factors of depression and anxiety

and the factors of depression and conduct problems. One explanation is that the relationship between measures of depression and conduct problems is stronger than might be expected in light of the literature. In fact, there is some evidence in the literature of a strong relationship between depression and conduct problems. As discussed previously, Cole and Carpentieri (1990) found a factor correlation of .73 between depression and conduct problems. In several samples, Achenbach and Edelbrock (1983) found factor correlations ranging from .48 to .63 between internalizing problems which includes depression and anxiety and externalizing problems syndrome which includes conduct problems. They proposed a global effect such that problems in one area can lead to problems in another area, particularly when children tend to express their problems through behaviour. It must be remembered that despite the strong association between depression and conduct problems, depression and conduct problems are better represented by a model of two distinct but covarying syndromes. A strong association does not contradict a two-factor model.

Another explanation of the similar correlations between depression and anxiety and depression and conduct problems is that the relationship between depression and anxiety is weaker than might be expected in light of the literature. This may be due to poor measures of anxiety which weaken the association between depression and anxiety. Unfortunately

there have been no other confirmatory factor analytic studies to use for comparison as there were for depression and conduct problems. Further replications are necessary to determine whether the measurement of anxiety can be improved and whether this would affect the strength of association between depression and anxiety.

The Measurement of Depression, Anxiety, and Conduct Problems

Measurement issues are very important in the assessment of childhood psychopathology. Many studies have examined the reliability and validity of measures of depression, anxiety, and to a lesser extent, conduct problems (e.g., Hodges, 1990; Matson & Nieminen, 1987; Perrin & Last, 1992). Confirmatory factor analysis provides a method to evaluate the psychometric adequacy of the measures, in particular, the ability of the measures to assess their respective underlying construct.

In the present study, significant factor loadings indicated that the constructs of depression and conduct problems were measured adequately. The construct of anxiety, however, was not measured adequately as only one of the three factor loadings for the anxiety measures was significant. Comparison of the size of the factor loadings indicated that conduct problems was the best measured construct, that depression was modestly to moderately well-measured, and that anxiety was poorly measured. When depression and anxiety were combined into one construct, none of the anxiety

measures loaded onto that construct whereas all three of the depression measures loaded onto it. Thus, anxiety was not found to be adequately measured in either the one- or two-factor models.

One explanation of this poor measurement is that the anxiety scales used did not adequately measure the construct. It will be necessary to consider the three measures of anxiety used. The parent-report measure, the Personality Inventory for Children-Anxiety Scale (PIC-ANX; Wirt et al., 1990), was shown in the present study to measure inadequately the construct of anxiety. Two versions of the State-Trait Anxiety Inventory for Children-Trait scale (STAIC-T; Spielberger, 1973) were used: One was the original child self-report; the other was the parent-report version (a modification of the child self-report). The child self-report was shown to measure inadequately the construct of anxiety. The parent-report was shown to be the only adequate measure of anxiety in the present study.

The finding that the PIC-ANX failed to measure adequately the construct of anxiety is surprising since it was selected because of its demonstrated ability to assess clinically significant anxiety in children. The PIC-ANX appears to sample a wider range of anxiety symptoms than the STAIC-T but over half of its items (17 of 30) overlap with the PIC-Depression scale. In contrast to the PIC's Anxiety scale, the Depression scale was shown to be a moderate

measure of the construct of depression and the Delinquency Scale was shown to be an adequate measure of the construct of conduct problems. Thus, the problem appears to be with the anxiety scale (or the anxiety construct) rather than the PIC as a whole.

The other anxiety measure used, the STAIC-T, is one of the two widely used children's self-report measures of anxiety. The other measure is the Revised Children's Manifest Anxiety Scale (RCMAS; Reynolds & Richmond, 1985). Both of these measures were developed as trait measures to assess anxiety proneness in normal children. In neither case, were the scales developed to assess symptoms of clinically significant anxiety which have been shown to differ from symptoms of anxiety in normal children (Bell-Dolan, 1991; Werry, 1986); nor were the scales standardized on clinical populations since the norms, at least for the STAIC-T, are based on anxiety scores of normal fourth to sixth graders; nor did the scales differentiate anxiety-disordered children from either normal groups of children or other psychiatric groups which is the strongest test of validity for assessing clinically significant anxiety. Only after development, were the STAIC-T and RCMAS used in clinical settings for the screening of anxiety disorders. Studies attempting to validate that the STAIC-T and RCMAS distinguish anxiety disorders from other psychiatric disorders have generally failed to do so (Bernstein, 1991;

Strauss et al., 1988; Stavrakaki et al., 1987) although there have been some exceptions (Hodges, 1990). Indeed, a recent study (Perrin & Last, 1992) aptly entitled "Do Childhood Anxiety Measures Measure Anxiety?" found that the STAIC-T and the RCMAS did not distinguish between anxiety-disordered children and attention-deficit hyperactivity disordered children, although the STAIC-T and RCMAS did distinguish between anxiety-disordered children and normal controls. Thus, as in the case of the CDI, there is evidence that anxiety measures distinguish global distress rather than anxiety. Whatever they distinguish, two of the three anxiety measures in the present study did not distinguish the construct of anxiety as set forth in the study.

The second explanation of the poor measurement of anxiety is that the construct may be poorly defined. It is defined in the present study from both the developmental perspective of Werry and colleagues (1986) and that of DSM-IV. According to Werry and colleagues, the construct of anxiety is defined by subjective symptoms such as worry and fear, by physiological symptoms such as high arousal and somatic complaints, by cognitive symptoms such as inattention and poor memory, and by behavioural symptoms such as nervousness, compulsions and avoidance. Impairment of functioning is also key to diagnosis. The categories of anxiety disorders in DSM-IV (e.g., separation anxiety disorder, generalized anxiety disorder, obsessive compulsive

disorder) further articulate the construct of anxiety in the present study. It is apparent from examining the items of the STAIC-T that it assesses a construct involving general distress, worry, fear and high physiological arousal but that it does not go much beyond that. In fact, it does not assess some of the important features of DSM-IV anxiety disorders. Consider the example of separation anxiety disorder, which is the most frequently diagnosed disorder in children other than generalized anxiety disorder (Kovacs et al., 1989). The essential feature of separation anxiety disorder (i.e., fear of separation from major attachment figures) is not represented on the questionnaires. Thus, it is not surprising that anxiety measures such as the STAIC-T generally fail to differentiate DSM anxiety disorders in the literature. It would seem important, then, to work towards better correspondence between anxiety measures and the construct they measure, either by fine-tuning the construct or by fine-tuning the anxiety measures.

In the present study, the CDI and the PIC-Depression scale measured their respective constructs better than most of the anxiety measures. The factor loadings indicate that the construct of depression was modestly to moderately well-measured. These findings provide support for the CDI and PIC as a screening measures of depression.

There has been considerable debate in the literature over the ability of the CDI to identify depression. Although

it has been consistently found to discriminate between depressed children and normal controls (e.g., Kovacs 1980/81; Saylor et al., 1984b), there is conflicting evidence of its ability to discriminate depression from other psychiatric disorders. While a number of studies have found that the CDI does not discriminate between depressed and nondepressed psychiatric groups (e.g., Bernstein, 1991; Saylor et al., 1984b), other studies have found that depressed children did score higher on the CDI than psychiatric controls (e.g., Hodges, 1990; Lobovitz & Handal, 1985). Studies examining the specificity and sensitivity of the CDI have varied in their results (Asnarow & Carlson, 1985; Kazdin et al., 1986; Lobovitz & Handal, 1985), but in general the authors have concluded that the CDI is an adequate screening measure but that it is not adequate for diagnosing depression. This is consistent with the conclusion reached in the present study: that the CDI adequately measures the severity of depressive symptoms, but that is not sufficiently strong a measure to make a diagnosis.

The construct of conduct problems was well-measured in the present study. This is shown by the factor loadings but also by the finding that it was the only construct in which the trait variance generally exceeded method variance. In other words, it was the only construct in which the measurement of a trait was more important to the results than the method of reporting (i.e., parent or child).

There are few (if any) self-report measures of conduct disorder, but as in the present study, conduct problems are usually assessed by subscales of broader measures. The Delinquent and Aggressive scales of the Child Behaviour Checklist (CBCL; Achenbach & Edelbrock, 1983) and the Delinquency scale of the PIC, both appear to do a good job of measuring the construct of conduct problems. The few studies (Matson & Nieminen, 1987), that have examined depression and conduct problems have shown similar results: that the constructs of depression and conduct problems can be differentiated.

The construct of conduct problems appears to be the most homogeneous construct, in that it basically consists of a list of behaviour problems. The construct of depression appears to be more heterogeneous than conduct problems, consisting of various affective, cognitive, and behavioural symptoms in addition to the basic symptoms of dysphoria and anhedonia. Anxiety appears to be the construct whose symptoms are most disparate. There are ten different types of anxiety disorders, with symptoms ranging from excessive anxiety associated with separation from parental figures in separation anxiety disorder to obsessive thoughts and compulsions in obsessive-compulsive disorder. Perhaps this extreme hetrogenity of symptoms is one of the reasons why it is difficult to define and measure anxiety.

Parent and Child Report

The present study found that the association between parent and child report was significant but modest. This finding is consistent with research that has shown low-to-moderate agreement between parent and child report (e.g., Achenbach et al., 1987; Herjanic & Reich, 1982; Renouf & Kovacs, 1994).

The study also reinforces the importance of including parent and child report as a source of method variance in assessing child psychopathology. In the present study, the model that did not include method variance was rejected in favour of a model that included method variance. As well, method variance due to parent and child report generally exceeded trait variance due to depression, anxiety, and conduct problems. Who is doing the reporting appears to be a greater source of variability than what is being reported. This is not an uncommon finding in studies of multitrait-multimethod designs (Byrne, 1994; Campbell & Fiske, 1959; Kavanagh, MacKinney & Leroy, 1971).

The findings also revealed that the factor loadings of children's measures on all three constructs were consistently lower than the factor loadings of parents' measures. This suggests that parent report was superior to child report in assessing the respective constructs. There has been a long history of establishing the credibility of children as sources of information about their own problems (Herjanic &

Reich, 1975). The findings of the present study do not mean that children are not credible informants, rather they mean that children are less able to report on their depression than their parents for example. This may be a function of age of the child (i.e., children's ability to reflect on and express themselves about their problems). There is some indication in the literature that age is an important factor in parent-child agreement (Edelbrock, 1985; Kovacs et al., 1984), although this finding has not been consistently replicated. For example, Edelbrock et al. (1985) found that children under the age of 10 were generally unreliable reporters, and that reliability increased as children grew older. Age differences were not able to be assessed in the present study, due to the design and the number of subjects. The study, however, points out the low rate of parent-child agreement and the differential ability of parent and child report to assess psychopathological constructs.

The findings in the present study indicated that parents rated their children as more depressed, more anxious, and more conduct disordered than the children rated themselves. This is in contrast to the literature which generally shows that the type of symptom affects parent and child report, with parents reporting more behavioural problems and children reporting more problems with internal states such as depression and anxiety (Edelbrock et al., 1986; Herjanic & Reich, 1982; Kashini et al., 1985)

Clinical Implications

The study has implications for a taxonomy of children's disorders, with the caveat that the study examines symptomatology, not disorders. According to the study, both one and two-factor models of depression and anxiety are viable explanations of the relationship between depression and anxiety in children. This means that depression and anxiety can be considered as separate constructs with overlapping features which is consistent with the view of DSM-IV. The International Classification of Diseases-9 (ICD-9) also classifies depression and anxiety as separate disorders under the broader category of "disturbance of emotions specific to childhood." The findings also mean that depression and anxiety can be considered as one construct which is consistent with the view of the World Health Organization (WHO) (Rutter et al., 1969; Rutter, Schaffer, and Sheperd, 1975) which places depression and anxiety in the category of "neurotic disorders."

DSM-IV is the prevailing classification system for mental disorders in North America, and it is unlikely that clinicians will choose to use a taxonomy of childhood disorders that is different from it. It is possible, however, to modify DSM-IV to make it more consistent with empirical research. The results of the present study have implications for the modification of DSM-IV and implications for assessment. These implications will be developed within

the context of three different views of the relationship between depression and anxiety that are consistent with the results of the study.

The first view is that depression and anxiety can be analyzed on two levels: On a macro level, depression and anxiety can be viewed as one syndrome distinct from the entire range of other childhood disorders. On a micro level, looking only at the syndromes of depression and anxiety, depression and anxiety can be seen as having some common features, but also some unique features which distinguish the two syndromes. This is the broad-band narrow-band approach associated with Achenbach and his colleagues. With regard to DSM-IV, this view would recommend differentiating childhood and adult affective disorders, and moving childhood affective disorders to the special section for children and adolescent disorders. This view would also suggest the identification of a broad-band category of affective disorders and possibly the narrow-band syndromes of depression and anxiety. In this view assessment could work on two levels: first, identifying the broad-band category and whatever implications that might have, and then, if possible and useful, identifying narrow-band syndromes of depression and anxiety.

Another view is that there are different relations between depression and anxiety that account for the support of both one- and two-factor models in the present study. In the literature, there has been consistent support for

diagnoses of depression, anxiety, and both depression and anxiety, commonly referred to as mixed depression and anxiety. Although the diagnosis of mixed depression and anxiety can be achieved by making multiple nonhierarchical diagnoses, there seems to be a synergistic effect of dual syndromes that goes beyond simple co-occurrence (i.e., children who are both depressed and anxious represent a distinctive group, with more severe symptomatology, poorer treatment response, and greater chronicity) (Clark & Watson, 1991). In this view, depression and anxiety could be differentiated as separate disorders as they are now in DSM-IV, with the addition of a new category of mixed depression and anxiety. This would enable clinicians to make diagnoses of depression or anxiety where it is possible, and to make diagnoses of mixed depression and anxiety when neither diagnosis can be differentiated or both diagnoses are valid.

A third view that is consistent with the support for both one- and two-factor models in the present study is the tripartite model of depression and anxiety proposed by Clark & Watson (1991). They have considerable data to suggest that depression and anxiety share a nonspecific distress factor that includes general affective distress and some common symptoms. Despite this nonspecific distress factor, anxiety can be distinguished by physiological hyperarousal and depression can be distinguished by the lack of pleasurable activity (low PA). Assessment would involve assessing both

the shared distress factor and the unique features of the syndromes. Assessment of the general distress factor would assess both the presence of aversive states, (e.g., sadness, anger, worry, guilt, fear) and their absence (e.,g. calmness and relaxation). In addition to the assessment of the nonspecific distress factor, depression and anxiety would also be assessed. Assessment of anxiety would involve the assessment of physiological symptoms along with tension, fear and anxious mood while assessment of depression would involve assessment of loss of pleasure and other symptoms of melancholia. With regard to DSM-IV diagnosis, patients high on the general distress factor might receive a diagnosis of generalized affective disorder or mixed affective disorder (mild). Patients high on general distress and low PA would be diagnosed with depression, and patients with high general distress and high physiological arousal would be diagnosed with anxiety disorder. Patients who were high on all three factors would receive two possible diagnoses: major depression and anxiety disorder or mixed affective disorder (severe). Thus, changes to DSM-IV would involve the addition of categories for mixed affective disorder - (mild) (or severe) and changes in the assessment process.

Other Assessment Issues

In addition to the issues of taxonomy and diagnosis, the results of the study have further implications for the assessment of childhood depression, anxiety and conduct

problems. The substantial correlation between the constructs of depression and anxiety and depression and conduct problems in the present study suggests that there is substantial overlap at the symptom level, as well as the diagnostic level. The overlap of depression and anxiety and depression and conduct problems and the potential for misdiagnosis makes assessment of all possible symptomatology important. For example, when a child presents with conduct problems it would be important to assess depressive symptomatology, as well as conduct problems. Similarly with depression and anxiety, it would be important to assess both depressive and anxious symptomatology.

Conducting clinical interviews based on a structured interview schedule would seem to be the best way of systematically examining children's symptomatology. Several interview schedules have been developed such as the Interview Schedule for Children (ISC; Kovacs, 1983). The interview schedule provides a standard set of questions covering all symptoms of psychopathology in children which is administered separately to children and their parents. This method of assessment would seem to be particularly useful in assessing anxiety which has a broad spectrum of diverse symptoms.

The results of the present study suggest that the anxiety measures, the State-Trait Anxiety Inventory for Children and the Personality Inventory for Children - Anxiety scale, do a poor job of assessing clinically significant

anxiety. Thus, the clinician may want to use these measures cautiously even for screening purposes. The Children's Depression Inventory and the Personality Inventory for Children-Depression scale proved to be adequate measures of depressive symptomatology and thus useful screening tools. Similarly the Personality Inventory for Children and the Delinquency and Aggression scales of the Child Behaviour Checklist proved to be satisfactory measures of conduct problems. The Child Behaviour Checklist has a strong history of development and validation, and despite having narrow-band syndromes that don't necessarily correspond to DSM-IV, it would seem to be a useful overall screening measure. There was some liberty taken with the measures in the present study, in devising parent versions that matched child self-report (e.g., the CDI, parent report form), and child versions that matched adult scales (the Child Behaviour Checklist, child form). The results indicated that modifying these measures of depressive symptomatology and conduct problems resulted in adequate measurement of the respective constructs. Although further validation efforts are in order for such use of the scales, the clinician might find it useful to gain the perspective of both children and their parents on these scales.

The results of the study indicated that agreement of parent and child report was modest but that assessment of both child and parent perspectives was important in assessing

the constructs of depression, anxiety and conduct problems. These findings underscore the need to use both parent and child perspectives in the assessment of child psychopathology. There is some indication in the results of the study that parent reports are consistently better measures of a construct than are child self-reports. Except for the construct of anxiety, children's reports were significant, that is, they were adequate but modest measures of the constructs of depression and conduct problems. These results likely reflect the child's developmental limitations in making fine discriminations with regard to symptomatology. These limitations do not negate the value of child self-report, for children have been shown to be credible informants that offer a valuable perspective on their thoughts and feelings. These results do signal to the clinician, however, that children are limited in their understanding and expression of their problems, and that it might be wise to assess children's level of understanding and level of reading prior to completing self-report screening measures. One innovative study (Nguyen et al., 1994) has dealt with the problem of parent-child discrepancies by attempting to reconcile the discrepancies in an additional interview. This strategy not only improved parent-child agreement but it also provided additional information about the source of a discrepancy.

Limitations

Several qualifications need to be made with regard to the interpretation of the results of the study. Some of these qualifications are related to issues of scientific inference and some are related to methodological limitations of the study.

A basic principle of structural equation modeling is that models are not confirmed by the data, rather models are supported by failing to be disconfirmed (Cliff, 1983). A model that is not disconfirmed provides a plausible representation of the data, but other models may fit the data equally well or better. In part, this is illustrated in the present study by the finding that two models of depression and anxiety fit the data equally well. Although two major theories of depression and anxiety were tested, one must be open to the possibility that other models still exist which are equally plausible.

The sample size in the present study is somewhat smaller than that which is recommended for more complex designs such as this one. Problems with nonconvergence (i.e., not converging to a solution) and improper solutions (i.e., having parameter estimates that are not feasible) are likelier to occur with small sample size (Anderson & Gerbing, 1988). Nonconvergence was not a problem after appropriate starting values were selected. There was a problem, however, with improper solutions in that the EQS program constrained

two error estimates to zero. In a personal communication, Dr. P. Bentler, the developer of the EQS program, stated that this type of problem is usually associated with inadequate measures of a construct which is the case with the construct of anxiety (where the two constraints occurred). The overall measure of goodness-of-fit, the chi-square statistic, is also sensitive to sample size, so that with very large sample size models may be rejected due to small differences, and with very small sample size models may be supported when they are incorrect (Fassinger, 1987). Another goodness-of-fit index, the CFI (Bentler, 1992), which takes sample size into account, was also used to judge the fit of the models. It is apparent in the present study that the sample size was large enough to reject inadequate models as several were in fact rejected.

To restate a point made in the introduction, the study is based on assessment of syndromes, and not disorders. Certainly the measures assess symptoms that are very real and distressing to the subjects, but the measures are not sufficiently sensitive to serve as the sole means of providing a diagnosis. This qualification applies to the measures of anxiety and conduct problems as well.

Related to the notion that constructs are as good as their measures, there were some weaknesses in measurement of the constructs. The results indicate that the measures of anxiety were generally inadequate and in need of improvement.

As well, one important perspective, was absent from the measurement of the constructs: the perspective of the clinician. The perspective of the clinician was not assessed in the present study because the resources for data collection were limited. Clinician rating scales of childhood depression are available, and a rating scale of conduct problems could have been devised from the scales available.

In terms of representativeness, the two outpatient samples did not differ in their characteristics, so one can safely say that the results of the study are generalizable to outpatient populations. There is a possibility, however, that foster children and Aboriginal children were underrepresented in both samples. This may be due to selection processes operating within these two populations and within the institutional settings. It is also the case that it was difficult to obtain permission for foster children and Aboriginal children to participate because it was difficult to access the person or agency responsible.

Strengths of the Study and Directions for Future Research

The strength of the study is that it tests major theories of the relations between depression and anxiety and depression and conduct problems. It found that both of the models of depression and anxiety tested (depression and anxiety as separate but overlapping entities and depression and anxiety as a single entity) were good-fitting models.

These results were interpreted as providing viable options for nosology and assessment. With regard to depression and conduct problems, the model which best represented the relationship between the two constructs was a two-factor model in which depression and conduct problems were separate but overlapping entities. The study also found that the overlap between depression and conduct problems and depression and anxiety was substantial and similar in magnitude. Another strength of the study is that it assessed the psychometric adequacy of widely used measures of depressive and anxious symptomatology, as well as behavioural ratings. The results also showed the importance of taking child and parent report into account in assessing psychopathological constructs. A final strength of the study is that the measurement model that it develops provides a foundation for future research which applies structural equation modeling methodology to issues in childhood psychopathology.

Since the study is one of the first of its kind in modeling relationships between the constructs of depression, anxiety, and conduct problems, it would be important to replicate the findings on a new sample. Once a model has been tested and respecified and tested again, it is recommended that it be cross-validated on a new sample to be consistent with confirmatory methods (Anderson & Gerbing, 1988). Although in the end the models in the present study

were the same as the initial models proposed, various respecifications were tested in the analysis. In view of the possible limitations of sample size, replication with a larger sample would also be informative.

Future research might focus on the improvement of the measurement model developed in the present study. There are a number of possibilities for improving the measurement of the constructs. Ideally it would be better to have two measures of each syndrome from the child's perspective but the amount of time required for three syndromes would likely exceed children's attentional resources. In terms of measurement of anxiety, the other well known children's self-report measure of anxiety, the RCMAS, would not likely fare any better than the STAIC-T used in the present study, although both measures could be used at the same time to compare their relative efficacy in measuring anxiety. The STAIC-T has been modified by Fox and Houston (1983) to include additional items that assess somatic symptoms of anxiety. This modified scale might prove useful, particularly in light of the findings of Clark and Watson (1991), that the assessment of the physiological component of anxiety is one of the two ways of differentiating anxiety and depression. Another possibility would be to modify the anxiety measures to include items that tap common kinds of anxiety in children such as separation anxiety. Another possibility, if clinicians were included in the ratings, is

that structured interview schedules could be used to assess anxiety. Perhaps new anxiety scales could be developed from the structured interview schedules, rather than modifying existing measures of anxiety.

As mentioned in the section on limitations, including the clinician's perspective in the assessment of psychopathological constructs would be beneficial. This would require more involvement and more resources from the institutions, but it would yield a knowledgeable and important perspective in the assessment of child psychopathology. Even if clinicians' ratings were unavailable, it would have been helpful in the case of the present study to have known the actual diagnoses of the children participating in the study. These diagnoses could not have been used in the confirmatory factor analysis but they might have been used in secondary analyses to provide a criterion for comparison.

Any modification that would improve the discrimination of depression and anxiety constructs would be useful to assessing the constructs. In addition to improving the discrimination of anxiety measures by assessing physiological arousal, the discrimination of depression measures might be improved by the assessment of low positive affect since the literature suggests that the assessment of low positive affect is the second way of discriminating anxiety and depression (Brady & Kendall, 1992; Clark & Watson, 1991).

One final suggestion for measurement that might improve the discrimination of the constructs of depression, anxiety and conduct problems is to remove overlapping item content. The literature typically poses two possibilities for the high correlations between depression and anxiety measures: overlap due to common features of the constructs and overlap due to overlapping item content (Brady & Kendall, 1992; King et al., 1991; Stavrakaki et al., 1986). We can do little about overlapping constructs. It is not advisable in confirmatory factor analysis to load an item on two factors for example (Anderson & Gerbing, 1988). On the other hand, removing overlapping items might remove a large source of the common variance. One drawback is that this would change the interpretation of the constructs, raising the question of whether "pure" depression and anxiety really exists. This method of removing overlapping item content has been used in a handful of studies, and recently it has been used in a structural equation modeling study that examined the relations between constructs of depression and aggression, internalizing problems and externalizing problems (Weiss & Catron, 1994).

Once a satisfactory measurement model has been attained, future research can use structural equation methodology to examine other issues in this area. One avenue of study emanating from the present study would be the examination of a proposed temporal relationship between anxiety and

depression, with anxiety preceding depression (Dobson, 1985). Another avenue of study might use structural equation modeling to model the factors influencing parent and child agreement. Overall, structural equation modeling provides a promising tool for examining taxonomic theories, as well as other issues in childhood psychopathology.

References

Achenbach, T. M. (1980). DSM-III in light of empirical research on the classificiation of child psychopathology. Journal of the American Academy of Child Psychiatry, 19, 395-412.

Achenbach, T. M., & Brown, J. S. (1989). Bibliography of published studies using the Child Behaviour Checklist and related materials. Burlington, VT: University of Vermont Department of Psychiatry.

Achenbach, T. M., Connors, C. K., Quay, H. C., Verhulst, F. C., & Howell, C. T. (1989). Replication of empirically derived syndromes as a basis for taxonomy of child/adolescent psychopathology. Journal of Abnormal Child Psychology, 17, 299-323.

Achenbach, T. M., & Edelbrock, C. S. (1978). The classification of child psychopathology. Psychological Bulletin, 85, 1275-1301.

Achenbach, T. M., & Edelbrock, C. S. (1983). Manual for the Child Behaviour Checklist and Revised Behavior Profile. Burlington, VT: Queen City Printers.

Achenbach, T. M., McConaughy, S. H., & Howell, C. T. (1987). Child/adolescent behavioral and emotional problems: Implications of cross-informant correlations for situational specificity. Psychological Bulletin, 101, 213-232.

American Psychiatric Association. (1994). Diagnostic and statistical manual of mental disorders (4th ed.). DSM-IV.

Washington, DC: Authors.

American Psychiatric Association. (1987). Diagnostic and statistical manual of mental disorders (3rd ed. rev.). DSM-III-R. Washington, DC: Authors.

American Psychiatric Association. (1980). Diagnostic and statistical manual of mental disorders (3rd ed.). DSM-III. Washington, DC: Authors.

Anderson, J. C., & Gerbing, D. W. (1988). Structural equation modeling in practice: A review and recommended two-step approach. Psychological Bulletin, 103, 411-423.

Anderson, J. C., Williams, S., McGee, R., & Silava, P. A. (1987). DSM-III disorders in preadolescent children. Archives of General Psychiatry, 44, 69-76.

Angold, A. (1988). Childhood and adolescent depression I. Epidemiological and aetiological aspects. British Journal of Psychiatry, 152, 601-617.

Asnarow, J. R., & Carlson, G. A. (1985). Depression Self-rating Scale: Utility with child psychiatric patients. Journal of Consulting and Clinical Psychology, 53, 491-499.

Barrett, M. L., Berney, T. P., Bhate, S., Famuyiwa, O. O., Fundudis, T., Kolvin, I., & Tyrer, S.. (1991). Diagnosing childhood depression: Who should be interviewed - parent or child? The Newcastle child depression project. British Journal of Psychiatry, 159 (suppl. 11), 22-27.

Beck, A. T., Ward, C. H., Mendelson, M., Mock, J. E., & Erbaugh, J. K. (1961). An inventory for measuring depression. Archives of General Psychiatry, 4, 561-571.

Bell-Dolan, D. J., Last, C. G., & Strauss, C. C. (1990). Symptoms of anxiety disorders in normal children. Journal of the American Academy of Child and Adolescent Psychiatry, 29, 759-765.

Bemporad, J. R., & Wilson, A. (1978). A developmental approach to depression in childhood and adolescence. Journal of the American Academy of Psychoanalysis, 6, 325-352.

Bentler, P. M. (1992). On the fit of models to covariances and methodology to the Bulletin, Psychological Bulletin, 112, 400-404.

Bentler, P. M. (1989). EQS Structural Equations Program Manual. Los Angeles: BMDP Statistical Software.

Bentler, P. M. (1980). Multivariate analysis with latent variables: Causal modeling. Annual Review of Psychology, 31, 419-156.

Bernstein, G. A. (1991). Comorbidity and severity of anxiety and depressive disorders in a clinic sample. Journal of the American Academy of Child and Adolescent Psychiatry, 30, 43-50.

Bernstein, G. A., & Garfinkel, B. D. (1986). School phobia: The overlap of affective and anxiety disorders. Journal of the American Academy of Child Psychiatry, 25, 235-241.

Bernstein, I. H., & Teng, G. (1989). Factoring items and factoring scales are different: Spurious evidence for multidimensionality due to item categorization. Psychological Bulletin, 107, 238-246.

Brady, E. U., & Kendall, P. C. (1992). Comorbidity of anxiety and depression in children and adolescents. Psychological Bulletin, 111, 244-255.

Breier, A., Charney, D., & Heninger, G. (1985). The diagnostic validity of anxiety disorders and their relationship to depressive illness. The American Journal of Psychiatry, 142, 787-797.

Byrne, B. (1994). Structural equation modeling with EQS and EQS/Windows. Thousand Oaks, PA: Sage

Campbell, S. B. (1984). Research issues in clinical child psychology. In A. Bellack & M. Hersen (Eds.), Research methods in clinical psychology (pp. 324-352). New York: Raven Press.

Campbell, D., & Fiske, D. (1959). Convergent and discriminant validation by the multitrait-multimethod matrix. Psychological Bulletin, 56, 81-105.

Canadian Psychological Association. (1991). Canadian code of ethics for psychologists. Manitoba Psychologist, 11, 40-80.

Carlson, G., & Cantwell, D. (1980a). A survey of depressive symptoms, syndrome, and disorder in a child

psychiatric population. Journal of Child Psychology and Psychiatry, 21, 19-25

Carlson, G., & Cantwell, D. (1980b). Unmasking masked depression in children and adolescents. American Journal of Psychiatry, 137, 445-449.

Cicchetti, D., & Schneider-Rosen, K. (Eds.) (1984). Childhood depression: New directions for child development. San Francisco: Jossey Boss.

Clark, L. A., & Watson, D. (1991). Tripartite model of anxietyand depression: Psychometric evidence and taxonomic implications. Journal of Abnormal Psychology, 100, 316-336.

Cliff, N. (1983). Some cautions concerning the application of causal modeling methods. Multivariate Behavioral Research, 18, 115-126.

Cohen, J. (1977). Statistical power analysis for the behavioural sciences (Rev. Ed.). New York: Academic Press.

Cohen, J. (1960). A coefficient of agreement for nominal scales. Educational and Psychological Measurement, 20, 37-46.

Cole, D. A., & Carpentieri, S. (1990). Social status and the comorbidity of child depression and conduct disorder. Journal of Consulting and Clinical Psychology, 58, 748-757.

Dobson, K. S. (1985). The relationship between anxiety and depression. Clinical Psychology Review, 5, 307-324.

Eason, L. J., Finch, A. J., Brasted, W., & Saylor, C. F. (1985). The assessment of depression and anxiety in

hospitalized pediatric patients. Child Psychiatry and Human Development, 16, 57-65.

Edelbrock, C., Costello, A. J., Dulcan, M. K., Conover, N. C., & Kala, R. (1986). Parent and child agreement on child psychiatric symptoms assessed via structured interview. Journal of Child Psychology and Psychiatry, 27, 181-190.

Edelbrock, C., Costello, A. J., Dulcan, M. K., Kalas, R., & Conover, N. C. (1985). Age differences in the reliablity of the psychiatric interview of the child. Child Development, 56, 265-275.

Fassinger, R. E. (1987). Use of structural equation modeling in counseling psychology reserach. Journal of Counseling Psychology, 34, 425-436.

Feldman, L. A. (1993). Distinguishing depression and anxiety in self-report: Evidence from confirmatory factor analysis on nonclinical and clinical samples. Journal of Consulting and Clinical Psychology, 61, 631-638.

Finch, A. J., Lipovsky, J. A., & Casat, C. D. (1989). Anxiety and depression in children and adolescents: Negative affectivity or separate constructs. In P. C. Kendall and D. Watson (Eds.), Anxiety and depression: Distinctive and overlapping features, (pp. 171-202). New York: Academic Press.

Fleming, J. E., & Offord, D. R. (1990). Epidemiology of childhood depressive disorders: A critical review.

Journal of the American Academy of Child and Adolescent Psychiatry, 29, 571-580.

Fox, J. E., & Houston, B. K. (1983). Distinguishing between cognitive and somatic trait and somatic state anxiety in children. Journal of Personality and Social Psychology, 45, 862-870.

Freud, S. (1963). The analysis of a phobia of a five-year-old boy. Standard edition of the complete psychological works of Sigmund Freud (vol. 10). London: Hogarth (Original work published in 1909).

Froman, P.K. (1971). The development of a depression scale for the Personality Inventory for Children (PIC). Unpublished manuscript, University of Minnesota, Minneapolis.

Glaser, K. (1968). Masked depression in children and adolescents. Annual Progress of Child Psychiatry and Development, 21, 345-355.

Helzer, J. E., Clayton, P. J., Pambakian, R., Reich, T., Woodruff, R. A., & Reverly, M. A. (1977). Reliablity of psychiatric diagnosis. II. The test/retest reliablity of diagnositic classification. Archives of General Psychiatry, 34, 136-141.

Herjanic, B., Herjanic, M., Brown, F., & Wheatt, T. (1975). Are children reliable reporters? Journal of Abnormal ChildPsychology, 3, 41-48.

Herjanic, B., & Reich, W. (1982). Development of a structured psychiatric interview for children. Agreement

between child and parent on individual symptoms. Journal of Abnormal Child Psychology, 307-324.

Hershberg, S. G., Carlson, G. A., Cantwell, D. P., & Strober, M. (1982). Anxiety and depressive disorders in psychiatrically disturbed children. Journal of Clinical Psychiatry, 43, 358-361.

Hodges, K. (1990). Depression and anxiety in children: A comparison of self-report questionnaries to clinical interview. Psychological Assessment, 2, 376-381.

Ivens, C., & Rehm, L. P. (1988). Assessment of childhood depression: Correspondence between reports by child, mother, and father. Journal of the American Academy of Child and Adolescent Psychiatry, 27, 738-741.

Kashini, J. H., Husain, A., Shekim, W. O., Hodges, K. K., Cytryn, L., & McKnew, D. H. (1981). Current perspectives on childhood depression: An overview. American Journal of Psychiatry, 138, 143-153.

Kashini, J. H., Orvaschel, H., Burk, J. P., & Reid, J. C. (1985). Informant variance: The issue of parent-child agreement. Journal of the American Academy of Child Psychiatry, 24, 437-441.

Kashini, J. H., McGee, R. O., Clarkson, S. E., Anderson, J. C., Walton, L. A., Williams, S., Silva, P. A., Robins, A. J., Cytryn, L., & McKnew, D. H. (1983). Depression in a sample of 9 year-old children. Archives of General Psychiatry, 40, 1217-1223.

Kavanagh, M. J., MacKinney, A. C., & Wolins L. (1971). Issues in managerial performance: Multitrait-multimethod analyses of ratings. Psychological Bulletin, 75, 34-49.

Kazdin, A. E. (1989). Identifying depression in children: A comparison of alternative selection criteria. Journal of Abnormal Child Psychology, 17, 437-454.

Kazdin, A. E. (1987a). Assessment of childhood depression: Current issues and strategies. Behavioral Assessment, 9, 291-319.

Kazdin, A. (1987b). Treatment of antisocial behavior in children: Current status and future directions. Psychological Bulletin, 102, 187-203.

Kazdin, A. E., Colbus, D., & Rodgers, A. (1986). Assessment of depression and diagnosis of depressive disorder among psychiatrically disturbed children. Journal of Abnormal Child Psychology, 14, 499-515.

Kazdin, A. E., French, N. H., Unis, A. S., & Esveldt-Dawson, K. (1983). Assessment of childhood depression: Correspondence of child and parent ratings. Journal of the American Academy of Child Psychiatry, 22, 157-164.

King, N. J., Ollendick, T. H., & Gullone, E. (1991). Negative affectivity in children and adolescents: Relations between anxiety and depression. Clinical Psychology Review, 11, 441- 459.

Kline, R. B., Lachar, D., & Gdowski, C. L. (1987). A Personality Inventory for Children profile typology of

children and adolescents: II. Classification rules and specific behaviour correlates. Journal of Clinical Child Psychology, 16,
225-234.

Kline, R. B., Lachar, D., Gdowski, C. L. (1988). Convergence and concurrent validity of DSM-III diagnoses and the Personality Inventory for Children (PIC). Canadian Journal of Behaviour Science, 20, 251-264.

Kovacs, M. (1985). The Interview Schedule for Children (ISC): Psychopharmacological Bulletin, 21, 991-994.

Kovacs. M. (1980/1981). Rating scales to assess depression in school-aged children. Acta Paedopsychiatria, 46, 305-315.

Kovacs, M., & Beck, A. (1977). An empirical-clinical approach towards a definition of childhood depression. In J. Schulterbrandt (Ed.), Depression in childhood: Diagnosis, treatment and conceptual models. New York: Raven Press.

Kovacs, M., Feinberg, T. L., Crouse-Novak, M. A., Paulauskas, S. L., Finkelstein, R. (1984). Depressive disorders in childhood. I. A longitudinal prospective study of characteristics and recovery. Archives of General Psychiatry, 41, 229-237.

Kovacs, M., Gatsonis, C., Paulauskas, S. L., & Richards, C. (1989). Depressive disorders in childhood. IV. A longitudinal study of comrbidity with and risk for anxiety disorders. Archives of General Psychiatry, 46, 776-782.

Kovacs, M., Paulauskas, S. L., Gatsonis, C., & Richards, C. (1988). Depressive disorders in childhood. III. A longtitudinal study of the comorbidity with and risk for conduct disorders. Journal of Affective Disorders, 15, 205-217

Lachar, D., Gdowski, C. L., & Snyder, D. K. (1984). External validation of the Personality Inventory for Children (PIC) profile and factor scales: Parent, teacher, and clinician ratings. Journal of Consulting and Clinical Psychology, 52, 155-164.

Lachar, D., & LaCombe, J. A. (1983). Objective personality assessment: The Personality Inventory for Children and its applications in the school setting. School Psychology Review, 12, 399-406.

Lann, I. S. (1991). Introduction to special issue of assessment of childhood anxiety disorders. Journal of Anxiety Disorders, 5, 101-103.

Last, C. G. (1988). Anxiety disorders in childhood and adolescence. In C. G. Last and M. Hersen (Eds.), Handbook of Anxiety Disorders (pp. 531-540). New York: Pergamon Press.

Leon, G. R., Kendall, P. C., & Garber, J. (1980). Depression in children: Parent, teacher, and child perspectives. Journal of Abnormal Child Psychology, 8, 221-235.

Lobovitz, D. A., & Handal, P. J. (1985). Childhood depression: Prevalence using DSM-III criteria and validity of

parent and child depression scales. Journal of Pediatric Psychology, 10, 45-54.

Loeber, R., & Schmaling, K. B. (1985). Empirical evidence and covert patterns of antisocial conduct problems: A meta-analysis. Journal of Abnormal Child Psychology, 12, 337-352.

Loehlin, J. C. (1987). Latent variable models: An introduction to factor, path, and structural analysis. Hillsdale, NJ: Lawrence Erlbaum.

Marriage, K., Fine, S., Moretti, M., & Haley, G. (1986). Relationship between depression and conduct disorder in children and adolescents. Journal of the American Academy of Child Psychiatry, 25, 687-691.

Matson, J. L., & Nieminen, G. S. (1987). Validity of measures of conduct disorder, depression, and anxiety. Journal of Clinical Child Psychology, 16, 151-157.

McAuliffe, T. M., & Handal, P. J. (1984). PIC delinquency scale: Validity in relation to self-reported delinquent acts. Criminal Justice and Behavior, 11, 35-46.

McMahon, R. J. (1987). Some current issues in the behavioral assessment of conduct disordered children and their families. Behavioral Assessment, 9, 235-252.

Moretti, M. M., Fine, S., Haley, G., & Marriage, K. (1985). Childhood and adolescent depression: Child-report versus parent-report information. Journal of the American Academy of Child Psychiatry, 24, 298-302.

Morrison, D. F. (1983). Applied linear statistical methods. Englewood Cliffs, NJ: Prentice-Hall.

Mulaik, S. A. (1986). Factor analysis and psychometrika: Major developments. Psychometrica, 51, 23-33.

Nelson, W. M., Politano, P. M., Finch A. J., Wendel, N., & Mayhall, C. (1987). Children's Depression Inventory: Normative data and utility with emotionally disturbed children. Journal of the American Academy of Child and Adolescent Psychiatry, 26, 43-48.

Nguyen, N., Whittlesey, S., Scimeca, K., DiGiacomo, D., Bui, B., Parsons, O., Scarborough, A., & Paddock, D. (1994). Parent-child agreement in prepubertal depression: Findings with a modified assessment method. Journal of the American Academy of Child and Adolescent Psychiatry, 33, 1275-1283.

Norvell, N., Brophy, C., & Finch, A. J. (1985). The relationship of anxiety to childhood depression. Journal of Personality Assessment, 49, 150-153.

Ollendick, T. H., & Yule, W. (1990). Depression in British and American children and its relation to anxiety and fear. Journal of Consulting and Clinical Psychology, 58, 126-129.

Orvaschel, H., & Weissman, M. W. (1985). Epidemiology of anxiety disorders in children: A review. In R. Gittleman (Ed.), Anxiety disorders in children (pp. 58-72).

Patterson, G. R. (1982). Coercive family process. Eugene, OR: Castelia.

Perrin, S., & Last, C. G. (1992). Do childhood anxiety measures measure anxiety. Journal of Abnormal Child Psychology, 20, 567-578.

Pineo, P. C. (1984). Revisions of the Pineo-Porter-McRoberts socioeconomic classification of occupations from the 1981 census. Unpublished manuscript.

Puig-Antich, J. (1982). Major depression and conduct disorder in prepuberty. Journal of the American Academy of Child Psychiatry, 21, 118-128.

Pfeffer, C., Plutchik, R., & Mizruchi, M. (1986). A comparison of psychopathology in child psychiatric inpatients, outpatients, and nonpatients. Journal of Nervous and Mental Disease, 174, 529-535.

Quay, H. C (1986a). Classification. In H. C. Quay & J. S. Werry (Eds.), Pschopathological disorders of childhood (3rd ed.) (pp. 1-34). New York: Wiley.

Quay, H. C. (1986b). Conduct disorders. In H. C. Quay & J. S. Werry (Eds.), Psychopathological disorders of childhood (3rd ed.) (pp. 35-72). New York: Wiley.

Quay, H. C. (1983). A dimensional approach to children's behavior disorder: The Revised Behavior Problem Checklist. School Psychology Review, 12, 244-249.

Quay, H. C., & LaGreca, A. M. (1986). Disorders of anxiety, withdrawal, and dysphoria. In H. C. Quay & J. S.

Werry (Eds.), Psychopathological disorders of childhood (3rd ed.) (pp.73-110). New York: Wiley.

Quay, H. C., Routh, D. K., & Shapiro, S. K. (1987). Psychopathology of childhood: From description to validation. Annual Review of Psychology, 38, 491-532.

Renouf, A. G., & Kovacs, M. (1994). Concordance between mothers' reports of depressive symptoms: A longtitudinal study. American Academy of Child and Adolescent Psychiatry, 33, 208-216.

Reynolds, C., & Richmond, B. (1985). Manual for the Revised Children's Manifest Anxiety Scale. Los Angeles: Western Psychological Services.

Robins, L. N. (1981). Epidemiological approaches to natural history research: Antisocial disorders in children. Journal of the American Academy of Child Psychiatry, 20, 566-580.

Roth, M., Gurney, C., Garside, R., & Kerr, T. (1972). Studies in the classification of affective disorders: The relationship between anxiety states and depressive illness. British Journal of Psychiatry, 121, 147-161.

Rutter, M., Lebovici, S., Eisenberg, L., Sneznevvsky, A. V., Sadoun, R., Brooke, E., & Lin, T. Y. (1969). A tri-axial classification of mental disorder in childhood. Journal of Child Psychology and Psychiatry, 10, 41-61.

Rutter, M., Schaffer, D., & Shepherd, M. (1975). A

multiaxial classification of child psychiatric disorders. Geneva, Switzerland: World Health Organization.

Rutter, M., Tizard, J., & Whitmore, K. (Eds.). (1970). Education, health, and behaviour. London: Longmans.

Saylor, C. F., Finch, A. J., Baskin, C. H., Furey, W., Kelly, M. M. (1984a). Construct validity for measures of childhood depression: Application of multitrait-multimethod methodology. Journal of Consulting and Clinical Psychology, 52, 977-985.

Saylor, C. F., Finch, A. J., Spirito, A., & Bennett, B. (1984b). Children's Depression Inventory: A systematic evaluation of psychometric properties. Journal of Consulting and Clinical Psychology, 52, 955-967.

Sechrest, L. (1984). Reliability and validity. In A. Bellack & M. Hersen (Eds.), Research methods in clinical psychology (pp. 24-54). New York: Pergamon Press.

Shoemaker, O. S., & Erickson, M. T., & Finch, A. J. Depression and anger in third- and fourth-grade boys: A multimethod assessment approach. Journal of Clinical Child Psychology, 15, 290-296.

Skinner, H. A. (1984). Correlational methods in clinical research. In A. Bellack & M. Hersen (Eds.), Research methods in clinical psycohology (pp. 324-352). New York: Raven Press.

Smucker, M. R., Craighead, W. E., Craighead, L. W., & Green, B. J. (1986). Normative and reliability data for the

Children's Depression Inventory. Journal of Abnormal Child Psychology, 14, 25-39.

Spielberger, C. D. (1973). State-trait Anxiety Inventory for Children. Palto Alto, CA: Consulting Psychologist Press.

Spielberger, C. D., Gorsuch, R. L., & Lushene, R. E. (1970). Manual for the State-Trait Anxiety Inventory (Self-evaluation Questionnaire). Palto, Alto, CA: Consulting Psychologists Press.

Statistics Canada. (1981). Standard occupational classification 1980. Ottawa: Minister of Supply and Services Canada.

Stavrakaki, C., Caplan Williams, E., Walker, S., Roberts, N., & Kotsopoulos, S. (1991). Canadian Journal of Psychiatry, 36, 332-338.

Stavrakaki, C., & Vargo, B. (1986). The relationship of anxiety and depression: A review of the literature. British Journal of Psychiatry, 149, 7-16.

Stavrakaki, C., Vargo, B., Boodoosingh, L, & Roberts, N. (1987). The relationship between anxiety and depression in children: Rating scales and clinical variables. Canadian Journal of Psychiatry, 32, 433-439.

Stavrakaki, C., Vargo, B., Roberts, N., & Boodoosingh, L. (1987). Concordance among sources of information for ratings of anxiety and depression in children. Journal of

the American Academy of Child and Adolescent Psychiatry, 26, 733-737.

Strauss, C. C., Forehand, R., Frame, C., & Smith, K. (1984). Characteristics of children with extreme scores on the Children's Depression Inventory. Journal of Clinical Child Psychology, 13, 227-231.

Strauss, C. C., Frame, C. L., & Forehand, R. (1987). Psychosocial impairment associated with anxiety in children. Journal of Clinical Child Psychology, 16, 235-239.

Strauss, C. C., Last, C. G., Hersen, M., & Kazdin, A. E. (1988). Association between anxiety and depression in children. Journal of Abnormal Child Psychology, 16, 57-68.

Tabachnick, B. G., & Fidell, L. S. (1990). Using multivariate statistics (2nd ed.). New York: Harper Collins.

Toolan, J. M. (1962). Depression in children and adolescents. American Journal of Orthopsychiatry, 32, 404-414.

Watson, D., & Clark, L. A. (1984). Negative affectivity: The disposition to experience aversive emotional states. Psychological Bulletin, 96, 465-490.

Weiss B., & Catron, T. (1994). Specificity of the comorbidity of aggression and depression in children. Journal of Abnormal Child Psychology, 22, 389-401.

Werry, J. S. (1986). Diagnosis and assessment. In R. Gittleman (Ed.), Anxiety disorders in children (pp. 73-100). New York: Guilford Press.

Werry, J. S., & Aman, M. (1980). Anxiety in children. In G. Burrows & B. Davies (Eds.), Handbook of studies on anxiety (pp. 165-192). Amsterdam: ASP Biological & Medical Press.

Werry, J., Reeves, J., & Elkind, G. (1986). Attention deficit, conduct, oppositional and anxiety disorders in children: A review of research on differentiating characteristics. Journal of the American Academy of Child Psychiatry, 9, 397-415.

Wirt, R. D., Lachar, D., Klinedinst, J. K., & Seat, P. D. (1990). Multidimensional description of child personality: A manual for the Personality Inventory for Children (3rd ed.). Los Angeles: Western Psychological Services.

Wolfe, V. V., Finch, A. J., Saylor, C. F., Blount, R. L., Pallmeyer, T. P., & Carek, D. J. Negative affectivity in children: A multitrait-multimethod investigation. Journal of Consulting and Clinical Psychology, 55, 245-250.

Woolston, J. L., Rosenthal, S. L., Riddle, M. A., Sparrow, S. S., Cicchetti, D., Zimmerman, L. D. (1989). Childhood comorbidity of anxiety, affective disorders and behaviour disorders. Journal of the American Academy of Child and Adolescent Psychiatry, 28, 707-713.

Appendix A: Consent Form

October 10, 1991

Dear Parent:

I am an Psychology Intern at the Royal University Hospital, and as my final doctoral requirement I am doing a study entitled "The Assessment of Children's Emotional and Behavioural Problems." The study addresses the issue of how to classify the emotional and behavioural problems of children in the most meaningful way. This is important because better assessment of children's problems leads to better understanding and treatment. The study targets children ages 7 to 11 who are seen as outpatients at Children's Services. Participation in the study is expected to have direct benefits to you and your child because certain assessment information will be forwarded to your physician at Children's Services. This information may be helpful in assessment and treatment but this cannot be guaranteed.

I am asking you and your child to participate in the study by answering several questionnaires which are commonly used to assess children's problems. I will meet with your child once to administer three questionnaires. The questionnaires consist of statements of thoughts, feelings, and behaviour (e.g.,"I worry about making mistakes") to which the child responds by choosing the statement which best describes him or her. This administration will take about 30 minutes. For your part, you will be given a brief information sheet and four questionnaires which ask you to rate your child's behaviour. This will take about an hour of your time. You can do this in the waiting room while I see your child or at home. You may return the questionnaires in-person or you may mail them in the stamped, addressed envelope provided. As a special thank you, your child will receive stickers or sports cards.

Your participation is completely voluntary and will not affect the service you receive at the Royal University Hospital. You may withdraw from the study at any time. Should any circumstances arise that may affect your decision to take part in the study, I will inform you of them. Although it is not expected that these questionnaires will cause stress or discomfort to you or your child, every effort will be made to alleviate any concerns that should arise.

Other than the sharing of certain assessment information with the your physician at Children's Services, the

information will be strictly confidential and used only for research purposes. I have taken the following steps to ensure anonymity. No names appear on the questionnaires, only a family identification number. Additionally, after the information is forwarded to your physician, the consent form will be separated from the questionnaires and there will no longer be any connection between the name and the questionnaire responses.

I would very much appreciate your cooperation. If you have any questions or concerns, please do not hesitate to call me at my office at the Divison of Psychology. My phone number is .

In order to participate in the study you will need to sign the consent form that is attached.

Yours sincerely,

Nancy E. Meyer, M.A.
Division of Psychology
Department of Psychiatry
Royal University Hospital

CONSENT FORM FOR PARTICIPATION

AND AUTHORIZATION FOR EXCHANGE OF INFORMATION

1. I have had the contents of the consent letter explained to me. I understand the contents of the letter and have received a copy for my own use.

2. NAME OF CHILD

_____

I am the parent or legal guardian of the child named above.

YES _____ NO _____

I give permission for the child named above to participate in the study.

YES _____ NO _____

3. I authorize the exchange of information that is gathered by Nancy Meyer to _____ at the Royal University Hospital.

YES _____ NO _____

NAME OF PARENT (PLEASE PRINT):

_____

SIGNATURE OF PARENT:

_____

SIGNATURE OF RESEARCHER:

_____

TELEPHONE NUMBER to arrange appointment:

_____

DATE: _____

Appendix B: Demographic Information Sheet

INFORMATION SHEET

Date: _____ Family #: _____ Admin.: _____

CHILD:

Birthday _____ Age in Years _____

Sex _____ Grade _____ Ethnic Background _____

Number of Children in the Family _____

Check one in each group:

1. The child is the:

_____ Youngest _____ Middle _____ Oldest _____ Only Child

2. The child's relationship to you:

_____ Biological Child _____ Step-child

_____ Foster Child _____ Adopted Child

_____ Other (Please Explain) _____

PARENTS:

3. _____ One Parent Family (child lives with one parent only)
_____ Two Parent Family (child lives with two parents)
_____ Other (Please Explain) _____

4. MOTHER:

Highest Level of Education _____

Employment Status:

_____ Employed Full Time _____ Employed Part Time
_____ Full Time Homemaker _____ In School Full Time
_____ Unemployed

Occupation if working outside the home
_____

Describe Job
_____

5. FATHER:

Highest Level of Education _____

Employment Status:

_____ Employed Full Time
_____ Employed Part Time
_____ Full Time Homemaker
_____ In School Full Time
_____ Unemployed

Occupation if working outside the home

_____

Describe Job

_____

Appendix C: Children's Depression Inventory

Child Self-report

CDI

Date: _____ Family #: _____ Admin.: _____

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 the next group.

There is no right or wrong answer. Just pick the sentence that best describes the way you have been recently. Circle the letter next to your answer.

Here is an example of how this form works. Try it. Circle the letter next to the sentence that describes how you feel best.

Example:
a. I read books all the time.
b. I read books once in a while.
c. I never read books.

Remember, pick out the sentence that describes your feelings and ideas in the past two weeks.

1. a. I am sad once in a while.
   b. I am sad many times.
   c. I am sad all the time.

2. a. Nothing will ever work out for me.
   b. I not sure that things will work out for me.
   c. Things will work out for me O.K.

3. a. I do many things O.K.
   b. I do many things wrong.
   c. I do everything wrong.

4. a. I have fun in many things.
   b. I have fun in some things.
   c. Nothing is fun at all.

5. a. I am bad all the time.
   b. I am bad many times.
   c. I am bad once in a while.

6. a. I think about bad things happening to me once in a while.
   b. I worry that bad things will happen to me.
   c. I am sure that terrible things will happen to me.

7. a. I hate myself.
   b. I do not like myself.
   c. I like myself.

8. a. All bad things are my fault.
   b. Many bad things are my fault.
   c. Bad things are not usually my fault.

9. a. I do not think about hurting myself.
   b. I think about hurting myself but I would not do it.
   c. I want to hurt myself.

10. a. I feel like crying everyday.
    b. I feel like crying many days.
    c. I feel like crying once in a while.

11. a. Things bother me all the time.
    b. Things bother me many times.
    c. Things bother me once in a while.

12. a. I like being with people.
    b. I do not like being with people many times.
    c. I do not want to be with people at all.

13. a. I cannot make up my mind about things.
    b. It is hard to make up my mind about things.
    c. I make up my mind about things easily.

14. a. I look O.K.
    b. There are some bad things about my looks.
    c. I look ugly.

15. a. I have to push myself all the time to do my school work.
    b. I have to push my self many times to do my school work.
    c. Doing school work is not a big problem.

16. a. I have trouble sleeping every night.
    b. I have trouble sleeping many nights.
    c. I sleep pretty well.

17. a. I am tired once in a while.
    b. I am tired many days.
    c. I am tired all the time.

18. a. Most days I do not feel like eating.
    b. Many days I do not feel like eating.
    c. I eat pretty well.

19. a. I do not worry about aches and pains.
    b. I worry about aches and pains many times.
    c. I worry about aches and pains all the time.

20. a. I do not feel alone.
    b. I feel alone many times.
    c. I feel alone all the time.

21. a. I never have any fun in school.
    b. I have fun in school only once in a while.
    c. I have fun at school many times.

22. a. I have plenty of friends.
    b. I have some friends but I wish I had more.
    c. I do not have any friends.

23. a. My school work is alright.
    b. My school work is not as good as before.
    c. I do very badly in subjects I used to do good in.

24. a. I can never be as good as other kids.
    b. I can be as good as other kids if I want to.
    c. I am just as good as other kids.

25. a. Nobody really loves me.
    b. I am not sure if anybody loves me.
    c. I am sure that somebody loves me.

26. a. I usually do what I am told.
    b. I do not do what I am told most times.
    c. I never do what I am told.

27. a. I get along with people.
    b. I get into fights many times.
    c. I get into fights all the time.

Appendix D: Children's Depression Inventory

Parent Report

CDI

Date: _____ Family #: _____ Admin.: _____

Kids sometimes have different feelings and ideas. This form lists the feelings and ideas in groups. From each group, pick one sentence that describes your child best for the past two weeks. After you pick a sentence from the first group, go on to the next group. Circle the letter next to your answer.

1. a. He is sad once in a while.
   b. He is sad many times.
   c. He is sad all the time.

2. a. He thinks that nothing will ever work out for him.
   b. He is not sure that things will work out for him.
   c. He thinks that things will work out for him O.K.

3. a. He thinks that he does many things O.K.
   b. He thinks that he does many things wrong.
   c. He thinks that he does everything wrong.

4. a. He has fun in many things.
   b. He has fun in some things.
   c. Nothing is fun for him at all.

5. a. He thinks that he is bad all the time.
   b. He thinks that he is bad many times.
   c. He thinks that he is bad once in a while.

6. a. He thinks about bad things happening to him once in while.
   b. He worries that bad things will happen to him.
   c. He is sure that bad things will happen to him.

7. a. He hates himself.
   b. He does not like himself.
   c. He likes himself.

8. a. He thinks that all bad things are his fault.
   b. He thinks that many bad things are his fault.
   c. He thinks that bad things are not usually his fault.

9. a. He does not think about hurting himself.
   b He thinks about hurting himself but would not do it.
   c. He wants to hurt himself.

10. a. He cries everyday.
    b. He cries many days.
    c. He cries once in a while.

11. a. Things bother him all the time.
    b. Things bother him many times.
    c. Things bother him once in a while.

12. a. He likes being with people.
    b. He does not like being with people many times.
    c. He does not want to be with people at all.

13. a. He cannot make up his mind about things.
    b. It is hard for him to make up his mind about things.
    c. He makes up his mind about things easily.

14. a. He thinks he looks O.K.
    b. He thinks there are some bad things about his looks.
    c. He thinks he looks ugly.

15. a. He has to push himself all the time to do his school work.
    b. He has to push himself many times to do his school work.
    c. Doing school work is not a big problem for him.

16. a. He has trouble sleeping every night.
    b. He has trouble sleeping many nights.
    c. He sleeps pretty well.

17. a. He is tired once in a while.
    b. He is tired many days.
    c. He is tired all the time.

18. a. Most days he does not feel like eating.
    b. Many days he does not feel like eating.
    c. He eats pretty well.

19. a. He does not worry about aches and pains.
    b. He worries about aches and pains many times.
    c. He worries about aches and pains all the time.

20. a. He does not feel alone.
    b. He feels alone many times.
    c. He feels alone all the time.

21. a. He never has any fun in school.
    b. He has fun in school only once in a while.
    c. He has fun at school many times.

22. a. He has plenty of friends.
    b. He has some friends but he wishes he had more.
    c. He does not have any friends.

23. a. His school work is alright.
    b. His school work is not as good as before.
    c. He does very badly in subjects he used to do good in.

24. a. He thinks he can never be as good as other kids.
    b. He thinks he can be as good as other kids if he wants to.
    c. He thinks he is just as good as other kids.

25. a. He thinks that nobody really loves him.
    b. He is not sure if anybody loves him.
    c. He is sure that somebody loves him.

26. a. He usually does what he is told.
    b. He does not do what he is told most times.
    c. He never does what he is told.

27. a. He gets along with people.
    b. He gets into fights many times.
    c. He gets into fights all the time.

Appendix E: Personality Inventory for Children

- Depression, Anxiety and Delinquency Scales

D = Depression Scale

A = Anxiety Scale

C = Conduct Problems Scale

PIC

Date: _____ Family #: _____ Admin.: _____

This inventory consists of statements about children. Read each statement. If a statement is TRUE or MOSTLY TRUE, as applied to your child, circle the T. If a statement is FALSE or NOT USUALLY TRUE, as applied to your child, circle the F.

D	1.	My child often plays with a group of children.	T	F
D	2.	My child hardly ever smiles.	T	F
D A	3.	My child worries about things that usually only adults worry about.	T	F
C	4.	My child's manners sometimes embarrass me.	T	F
D	5.	My child has a good sense of humour. . . .	T	F
D A	6.	My child is worried about sin.	T	F
D A	7.	My child has little self-confidence.	T	F
A	8.	Thunder and lightning bother my child.	T	F
D A	9.	My child often asks if I love him (her).	T	F
C	10.	My child is good at lying his (her) way out of trouble	T	F
D	11.	My child doesn't seem to care to be with others.	T	F
C	12.	My child jumps from one thing to another.	T	F

C	13.	My child has been in trouble for attacking others.	T	F
D A	14.	My child seems too serious minded.	T	F
D	15.	My child really has no real friend. . . .	T	F
D A C	16.	My child is as happy as ever.	T	F
D C	17.	My child often complains that others don't understand him (her).	T	F
C	18.	Sometimes I worry about my child's lack of concern for others' feelings.	T	F
A	19.	Often my child is afraid of little things.	T	F
C	20.	My child tends to see how much he (she) can get away with.	T	F
C	21.	My child often disobeys me.	T	F
C	22.	My child likes to show off.	T	F
C	23.	A scolding is enough to make my child behave.	T	F
D	24.	My child usually plays alone.	T	F
C	25.	My child doesn't seem to learn from mistakes.	T	F
C	26.	My child can't seem to wait for things like other children do.	T	F
A	27.	My child worries about talking to others.	T	F
A	28.	My child frequently has nightmares.	T	F
D A	29.	My child is usually in good spirits.	T	F
C	30.	My child will do anything on a dare. . .	T	F
D A	31.	My child is easily embarrassed.	T	F
D	32.	My child is always smiling.	T	F
D	33.	My child has as much pep and energy as most children.	T	F

C	34.	Recently the school has sent home notes about my child's bad behavior.	T	F
D	35.	My child often talks about death.	T	F
C	36.	My child has been difficult to manage.	T	F
C	37.	My child respects the property of others.	T	F
D	38.	Everything has to be perfect or my child isn't satisfied.	T	F
C	39.	Spanking doesn't seem to affect my child.	T	F
D	40.	My child often will cry for no apparent reason.	T	F
D A	41.	My child will worry a lot before starting something new.	T	F
D A	42.	My child usually looks at the bright side of things.	T	F
D A	43.	My child often has crying spells.	T	F
D	44.	My child seems tired most of the time.	T	F
D	45.	My child tends to pity him (her) self. .	T	F
D	46.	I often wonder if my child is lonely.	T	F
D A	47.	Usually my child takes things in stride.	T	F
C	48.	My child is likely to take remarks the wrong way.	T	F
D	49.	Little things upset my child.	T	F
D	50.	My child keeps thoughts to him (her) self.	T	F
D	51.	My child has usually been a quiet child.	T	F
D A	52.	My child broods some.	T	F
D A	53.	My child takes criticism easily.	T	F
C	54.	My child sometimes swears at me.	T	F

C	55.	My child seems bored at school.	T	F
C	56.	I can't get my child to do his (her) school lessons.	T	F
D	57.	It is likely that my child will stay in the house for days at a time.	T	F
D A	58.	My child is afraid of dying.	T	F
D	59.	My child doesn't seem to care to have fun.	T	F
D	60.	My child often stays in his (her) room for hours.	T	F
C	61.	My child seldom breaks rules.	T	F
D	62.	Several times my child has threatened to kill him (her) self.	T	F
D A C	63.	My child seems unhappy about our home life.	T	F
D A	64.	Others often remark on how moody my child is.	T	F
C	65.	The trouble with my child is a "chip on the shoulder.".	T	F
A	66.	Nothing seems to scare my child.	T	F
C	67.	My child can't sit still at school because of nervousness.	T	F
C	68.	I do not approve of most of my child's friends.	T	F
C	69.	Several times my child has been in trouble for stealing.	T	F
C	70.	My child has never been in trouble with the police.	T	F
D	71.	My child seldom talks.	T	F
A	72.	My child insists on keeping the lights on while sleeping.	T	F
C	73.	My child sometimes skips school.	T	F

C	74.	Money seems to be my child's biggest interest.	T	F
C	75.	Several times my child has threatened to run away.	T	F
C	76.	My child plays with friends who are often in trouble.	T	F
C	77.	My child has never been expelled from school.	T	F
D	78.	My child whines a lot.	T	F
C	79.	My child has never run away from home.	T	F
C	80.	My child smokes at home.	T	F
C	81.	I have heard that my child drinks alcohol.	T	F
C	82.	My child is rather absent-minded.	T	F
A	83.	My child is afraid of the dark.	T	F
C	84.	My child boasts about being sent to the principal in school.	T	F
D	85.	My child speaks of him (her) self as stupid or dumb.	T	F
C	86.	The child's father has very little patience with the child.	T	F
D	87.	My child's feelings are hurt easily.	T	F
D	88.	My child has trouble making decisions.	T	F
D	89.	Eating is no problem for my child.	T	F
A	90.	My child tends to talk faster than he (she) can think.	T	F
A	91.	My child is afraid of animals.	T	F
C	92.	My child has never been elected to an office in a club or school.	T	F
A	93.	My child worries about hurting others.	T	F
C	94.	Often my child talks back to me.	T	F

C	95.	My child belongs to a club.	T	F
D	96.	My child cries when scolded.	T	F
A	97.	My child doesn't seem to have any fear.	T	F
C	98.	My child is very critical of others.	T	F
C	99.	My child seldom gets into mischief.	T	F
A	100.	Chewing fingernails is a problem for my child.	T	F
C	101.	"Head in the clouds" describes my child.	T	F
C	102.	Often my child sets goals that are too high.	T	F

Appendix F: State-Trait Anxiety Inventory for Children

- Trait Scale

Child Self-report

STAIC

Date: _____ Family #: _____ Admin.: _____

A number of sentences that boys and girls use to describe themselves are given below. Read each sentence and decide if it is **hardly-ever,** or **sometimes,** or **often true** of you. Then for each sentence, **circle the word that describes you best.** There are no right or wrong answers. Remember, circle the word which seems to describe how you usually feel.

1.	I worry about making mistakes	Hardly-ever	Sometimes	Often
2.	I feel like crying	Hardly-ever	Sometimes	Often
3.	I feel unhappy	Hardly-ever	Sometimes	Often
4.	I have trouble making up my mind	Hardly-ever	Sometimes	Often
5.	It is difficult for me to face my problems. . .	Hardly-ever	Sometimes	Often
6.	I worry too much	Hardly-ever	Sometimes	Often
7.	I get upset at home	Hardly-ever	Sometimes	Often
8.	I am shy	Hardly-ever	Sometimes	Often
9.	I feel troubled	Hardly-ever	Sometimes	Often
10.	Thoughts run through my mind and bother me . . .	Hardly-ever	Sometimes	Often
11.	I worry about school	Hardly-ever	Sometimes	Often

12. I have trouble deciding what to do	Hardly-ever	Sometimes	Often
13. I notice that my heart beats fast	Hardly-ever	Sometimes	Often
14. I am secretly afraid	Hardly-ever	Sometimes	Often
15. I worry about my parents	Hardly-ever	Sometimes	Often
16. My hands get sweaty	Hardly-ever	Sometimes	Often
17. I worry about things that may happen	Hardly-ever	Sometimes	Often
18. It is hard for me to fall asleep at night	Hardly-ever	Sometimes	Often
19. I get a funny feeling in my stomach	Hardly-ever	Sometimes	Often
20. I worry about what others will think of me	Hardly-ever	Sometimes	Often

Appendix G: State-Trait Anxiety Inventory for Children

- Trait Scale

Parent Self-report

STAIC

Date: _____ Family #: _____ Admin.: _____

A number of sentences that boys and girls use to describe themselves are given below. Read each sentence and decide if it is **hardly-ever,** or **sometimes,** or **often true** of you. Then for each sentence, **circle the word that describes you best.** There are no right or wrong answers. Remember, circle the word which seems to describe how you usually feel.

1.	She worries about making mistakes	Hardly-ever	Sometimes	Often
2.	She feels like crying	Hardly-ever	Sometimes	Often
3.	She feels unhappy	Hardly-ever	Sometimes	Often
4.	She has trouble making up her mind	Hardly-ever	Sometimes	Often
5.	It is difficult for her to face her problems . .	Hardly-ever	Sometimes	Often
6.	She worries too much	Hardly-ever	Sometimes	Often
7.	She gets upset at home	Hardly-ever	Sometimes	Often
8.	She is shy	Hardly-ever	Sometimes	Often
9.	She feels troubled	Hardly-ever	Sometimes	Often
10.	Thoughts run through her mind and bother her . . .	Hardly-ever	Sometimes	Often
11.	She worries about school	Hardly-ever	Sometimes	Often

12. She has trouble deciding what to do	Hardly-ever	Sometimes	Often
13. She notices that her heart beats fast	Hardly-ever	Sometimes	Often
14. She is secretly afraid	Hardly-ever	Sometimes	Often
15. She worries about her parents	Hardly-ever	Sometimes	Often
16. Her hands get sweaty	Hardly-ever	Sometimes	Often
17. She worries about things that may happen	Hardly-ever	Sometimes	Often
18. It is hard for her to fall asleep at night	Hardly-ever	Sometimes	Often
19. She gets a funny feeling in her stomach	Hardly-ever	Sometimes	Often
20. She worries about what others will think of her	Hardly-ever	Sometimes	Often

Appendix H: Child Behaviour Checklist

- Aggressive and Delinquent Scales

Parent Report

Circled items are Aggressive and Delinquent Scale items.

CBCLP

Date: _____ Family #: _____ Admin.: _____

Below is a list of items that describe children. For each item that describes your child **now or within the past 6 months**, please circle **2** if the item is **very true** or **often true** of your child. Circle the **1** if the item is **somewhat** or **sometimes true** of your child. If the item is **not true** of your child, circle the **0**. Please answer all items as well as you can, even if some do not seem to apply to your child.

0 = Not True (as far as you know)
1 = Somewhat or Sometimes True
2 = Very True or Often True

0 1 2	1.	Acts too young for his/her age
0 1 2	2.	Allergy (describe): _____
0 1 2	3.	Argues a lot
0 1 2	4.	Asthma
0 1 2	5.	Behaves like the opposite sex
0 1 2	6.	Bowel movements outside toilet
0 1 2	7.	Bragging or boasting
0 1 2	8.	Can't concentrate, can't pay attention for long
0 1 2	9.	Can't get his/her mind off certain thoughts; obsessions (describe): _____ _____

0	1	2	10.	Can't sit still, restless, or hyperactive
0	1	2	11.	Clings to adults or too dependent
0	1	2	12.	Complains of loneliness
0	1	2	13.	Confused or seems to be in a fog
0	1	2	14.	Cries a lot
0	1	2	15.	Cruel to animals
0	1	2	16.	Cruelty, bullying, or meaness to others
0	1	2	17.	Day-dreams or gets lost in his/her thoughts
0	1	2	18.	Deliberately harms self or attempts suicide
0	1	2	19.	Demands a lot of attention
0	1	2	20.	Destroys his/her own things
0	1	2	21.	Destroys things belonging to his/her family
0	1	2	22.	Disobedient at home
0	1	2	23.	Disobedient at school
0	1	2	24.	Doesn't eat well
0	1	2	25.	Doesn't get along with other children
0	1	2	26.	Doesn't seem to feel guilty after misbehaving
0	1	2	27.	Easily jealous
0	1	2	28.	Eats or drinks things that are not food (describe): _____
0	1	2	29.	Fears certain animals, situations, or places, other than school (describe): _____
0	1	2	30.	Fears going to school
0	1	2	31.	Fears he/she might think or do something bad
0	1	2	32.	Feels he/she has to be perfect

0	1	2	33.	Feels or complains that no one loves him/her
0	1	2	34.	Feels that others are out to get him/her
0	1	2	35.	Feels worthless or inferior
0	1	2	36.	Gets hurt a lot, accident-prone
0	1	2	37.	Gets in many fights
0	1	2	38.	Gets teased a lot
0	1	2	39.	Hangs around with other children who get in trouble
0	1	2	40.	Hears things that aren't there (describe): _____
0	1	2	41.	Impulsive or acts without thinking
0	1	2	42.	Likes to be alone
0	1	2	43.	Lying or cheating
0	1	2	44.	Bites fingernails
0	1	2	45.	Nervous, highstrung, or tense
0	1	2	46.	Nervous movements or twitching (describe): _____
0	1	2	47.	Nightmares
0	1	2	48.	Not liked by other children
0	1	2	49.	Constipated, doesn't move bowels
0	1	2	50.	Too fearful or anxious
0	1	2	51.	Feels dizzy
0	1	2	52.	Feels too guilty
0	1	2	53.	Overeating
0	1	2	54.	Overtired
0	1	2	55.	Overweight

0 1 2 56. Physical problems without known medical cause:

0 1 2 a. Aches or pains

0 1 2 b. Headaches

0 1 2 c. Nausea, feels sick

0 1 2 d. Problems with eyes (describe):

_____

0 1 2 e. Rashes or other skin problems

0 1 2 f. Stomachaches or cramps

0 1 2 g. Vomiting, throwing up

0 1 2 h. Other (describe):_____

_____

0 1 2 57. Physically attacks people

0 1 2 58. Picks nose, skin, or other parts of the body (describe):_____

0 1 2 59. Plays with own sex parts in public

0 1 2 60. Plays with own sex parts too much

0 1 2 61. Poor school work

0 1 2 62. Poorly coordinated or clumsy

0 1 2 63. Prefers playing with older children

0 1 2 64. Prefers playing with younger children

0 1 2 65. Refuses to talk

0 1 2 66. Repeats certain acts over and over, compulsions (describe):_____

_____

0 1 2 67. Runs away from home

0 1 2 68. Screams a lot

0 1 2 69. Secretive, keeps things to self

0 1 2 70. Sees things that aren't there (describe):
_____

0 1 2 71. Self-conscious or easily embarassed

0 1 2 72. Sets fires

0 1 2 73. Sexual problems (describe):_____
_____

0 1 2 74. Showing off or clowning around

0 1 2 75. Shy or timid

0 1 2 76. Sleeps less than most children

0 1 2 77. Sleeps more than most children during the day and/or night (describe):_____
_____

0 1 2 78. Smears or plays with bowel movements

0 1 2 79. Speech problem (describe): _____
_____

0 1 2 80. Stares blankly

0 1 2 81. Steals at home

0 1 2 82. Steals outside the home

0 1 2 83. Stores up things he/she doesn't need (describe): _____

0 1 2 84. Strange behaviour (describe): _____
_____

0 1 2 85. Strange ideas (describe): _____
_____

0 1 2 86. Stubborn, sullen, or irritable

0 1 2 87. Sudden changes in mood or feelings

0 1 2 88. Sulks a lot

0 1 2 89. Suspicious

0 1 2 90. Swearing or obsence language

0 1 2 91. Talks about killing self

0 1 2 92. Talks or walks in sleep (describe): _____

0 1 2 93. Talks too much

0 1 2 94. Teases a lot

0 1 2 95. Temper tantrums or hot temper

0 1 2 96. Thinks about sex too much

0 1 2 97. Threatens people

0 1 2 98. Thumb-sucking

0 1 2 99. Too concerned with neatness or cleanliness

0 1 2 100. Trouble sleeping (describe): _____

0 1 2 101. Truancy, skips school

0 1 2 102. Underactive, slow moving, or lacks energy

0 1 2 103. Unhappy, sad, or depressed

0 1 2 104. Unusually loud

0 1 2 105. Uses alcohol or drugs (describe): _____

0 1 2 106. Vandalism

0 1 2 107. Wets self during the day

0 1 2 108. Wets the bed

0 1 2 109. Whining

0 1 2 110. Wishes to be of opposite sex

0 1 2 111. Withdrawn, doesn't get involved with others

0 1 2 112. Worrying

0 1 2 113. Please write in any problems your child has that were not listed above

_____

_____

_____

Appendix I: Child Behaviour Checklist

- Aggressive and Delinquent Scales

Child Self-report

CBCLC

Date: _____ Family #: _____ Admin.: _____

Below is a list of sentences that describe boys and girls. Read each sentence and decide if it is **very true** or **sometimes true** or **not true** of you. Then for each sentence, **circle the group of words that describes you best,** as you are now or as you have been in the past 6 months.

1.	I like animals	Very True	Sometimes True	Not True
2.	I argue a lot	Very True	Sometimes True	Not True
3.	I brag	Very True	Sometimes True	Not True
4.	I am pretty honest	Very True	Sometimes True	Not True
5.	I am mean to others.	Very True	Sometimes True	Not True
6.	I try to get a lot of attention	Very True	Sometimes True	Not True
7.	I am willing to help others when they need help	Very True	Sometimes True	Not True
8.	I destroy my things	Very True	Sometimes True	Not True
9.	I destroy things belonging to others	Very True	Sometimes True	Not True
10.	I can do certain things better than most kids. . .	Very True	Sometimes True	Not True
11.	I disobey my parents	Very True	Sometimes True	Not True

12. I disobey at school	Very True	Sometimes True	Not True
13. I can be pretty friendly	Very True	Sometimes True	Not True
14. I don't get along with other kids	Very True	Sometimes True	Not True
15. I am jealous of others.	Very True	Sometimes True	Not True
16. I like to try new things	Very True	Sometimes True	Not True
17. I get in many fights	Very True	Sometimes True	Not True
18. I hang around with kids who get into trouble	Very True	Sometimes True	Not True
19. I lie or cheat	Very True	Sometimes True	Not True
20. I can work well with my hands. . . .	Very True	Sometimes True	Not True
21. I am not liked by other kids	Very True	Sometimes True	Not True
22. I physically attack people	Very True	Sometimes True	Not True
23. I have a good imagination	Very True	Sometimes True	Not True
24. I run away from home	Very True	Sometimes True	Not True
25. I scream a lot. . .	Very True	Sometimes True	Not True
26. I set fires	Very True	Sometimes True	Not True
27. I stand up for my rights	Very True	Sometimes True	Not True
28. I show off or clown around	Very True	Sometimes True	Not True

29. I steal things at home	Very True	Sometimes True	Not True
30. I steal things from places other than home . .	Very True	Sometimes True	Not True
31. I enjoy being with other people	Very True	Sometimes True	Not True
32. I am stubborn	Very True	Sometimes True	Not True
33. My moods or feelings change quickly	Very True	Sometimes True	Not True
34. I get mad and don't talk to anybody I do this a lot	Very True	Sometimes True	Not True
35. I like to help others.	Very True	Sometimes True	Not True
36. I swear	Very True	Sometimes True	Not True
37. I talk to much	Very True	Sometimes True	Not True
38. I like to make others laugh	Very True	Sometimes True	Not True
39. I tease others a lot	Very True	Sometimes True	Not True
40. I have a hot temper.	Very True	Sometimes True	Not True
41. I try to be fair to others	Very True	Sometimes True	Not True
42. I threaten to hurt people	Very True	Sometimes True	Not True
43. I skip school	Very True	Sometimes True	Not True
44. I like a good joke	Very True	Sometimes True	Not True
45. I am louder than other kids. . .	Very True	Sometimes True	Not True

46. I destroy public property	Very True	Sometimes True	Not True
47. I try to help other people when I can	Very True	Sometimes True	Not True