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Risk Factors Associated with Depression in Early Adolescence

by

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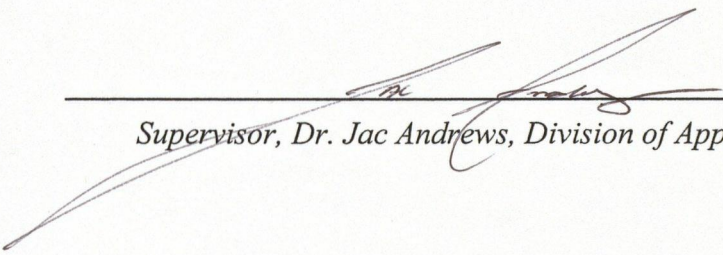
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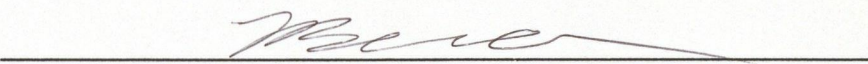
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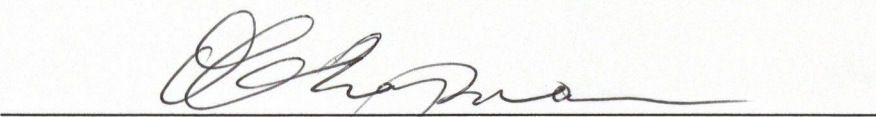
The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies for acceptance, a thesis entitled "Risk Factors for Depression in Early Adolescence", submitted by Angela MacPhee in partial fulfillment of the requirements for the degree of Master of Science.



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Abstract

The purpose of this study was to identify salient risk factors for depression in early adolescence from among a group of common predictors. The following nine predictors were examined: (1) perceived quality of peer relationships, (2) perceived parental nurturance, (3) perceived parental rejection, (4) self-esteem, (5) body image, (6) pubertal status, (7) SES, (8) conduct problems, and (9) hyperactivity/ inattention. Potential gender differences in the impact of these predictors, and several mediational models, were also examined.

Data on the 2014 participants, aged 12 and 13 years, were obtained from the National Longitudinal Survey of Children and Youth. Regression analyses revealed six risk factors as significant predictors of depressive symptoms, and gender differences in the impact of these risk factors. Self-esteem emerged as the strongest predictor of depressive symptoms in both genders. In addition, several variables were found to be mediators of relationships between risk factors and depression. Implications for prevention efforts, and directions for future research, are suggested.

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Chapter I: Introduction

Depression is considered by some to be one of the most serious forms of childhood psychopathology, due to the prevalence, chronicity, co-morbidity, and pervasive consequences associated with this disorder (Cicchetti & Toth, 1998). Because depression often diminishes important psychological resources, its presence can interfere with children's ability to accomplish developmental tasks, and as such, can result in lifelong impairment (Benjet & Hernandez-Guzman, 2002; Franko & Striegel-Moore, 2002). Its prevalence, estimated in children to be as high as 8%, is reported to be increasing (see Cicchetti & Toth, 1998; Muris, Schmidt, Lambrichs, & Meesters, 2001). In fact, it has been projected that by the year 2020, depression will become the second leading cause of disability in the world among the general population (see Benjet & Hernandez-Guzman, 2002).

Given that research into the phenomenon of depressive disorder in childhood is relatively recent, the current body of knowledge consists mainly of information on diagnostic characteristics and prevalence (Beardslee & Gladstone, 2001; Graham & Easterbrooks, 2000). However, some current researchers have turned their attention to the etiology of child and adolescent depression, attempting to identify the factors that create risk for the development of depressive symptoms. Understanding early risk factors is crucial, considering the continuity of depressive symptoms from childhood to adulthood, and the likelihood that many antecedents of adult depression date back to childhood (Beardslee & Gladstone, 2001; Garber & Flynn, 2001). With knowledge of childhood risk factors, current and future prevention initiatives can be enhanced, perhaps reducing

the number of children who will suffer the repercussions of a lifelong depressive disorder.

A review of the literature published in the recent past reveals that there is currently a large group of risk factors implicated in the development of depression. The risk factors that have had the most consistent associations with depression include parental depression, negative life events/life stress, problematic peer relations, negative parental rearing behavior, self-esteem, body image, pubertal status, socioeconomic status, conduct problems, and attention regulation problems.

Because most researchers have typically only examined a few risk variables at a single point in time in their studies, the picture of risk as it relates to depression lacks coherence. Without information about which risk factors from this large group should “take priority” in prevention programs, the development of prevention initiatives becomes an arduous task. Many working in this field of research have identified a need for new studies to examine many risk factors simultaneously (see Bennett, Bendersky, & Lewis, 2002; Kessler, Avenevoli, & Merikangas, 2001; Muris et al., 2001; Sagrestano, Paikoff, Holmbeck, & Fendrich, 2003; and Sato, Uehara, Narita, Sakado, & Fujii, 2000), for more studies to examine mediational and moderational models of risk (Garber & Flynn, 2001), and for more studies to take into consideration gender-specific pathways to depression (Cicchetti & Toth, 1998; Connell & Goodman, 2002; Jacobson & Rowe, 1999).

This study represents an attempt to address these research needs. The main purpose of the current study is to identify the most salient risk factors for depression from among a group of previously demonstrated risk factors. In addition, potential gender

differences in the impact of risk factors, and possible mediating variables, are explored in this study. The large-scale data collection required to execute a study of this magnitude is made possible by the creation of the National Longitudinal Survey of Children and Youth (NLSCY) by Statistics Canada. The NLSCY consists of an extensive amount of data on a large sample of Canadian youth; hence, a unique opportunity existed to include many risk factors for depression in one design. Therefore, the NLSCY database was the source of all data included in the current study.

In Chapter II, the literature pertaining to depression in youth is overviewed. Prior research findings regarding risk factors and their association to depression are discussed. In Chapter III, the sample is described, the psychometric properties of the included measures are discussed, and the data analysis plan is delineated. In Chapter IV, the results of all statistical analyses are presented. Finally, in Chapter V, the findings pertaining to each research question are discussed in turn. Each finding is considered in the context of prior research findings, and with respect to the goals and purpose of the present study. In addition, implications of the current findings, strengths and limitations of this study, and suggestions for further research, are offered.

Chapter II: Literature Review

In this chapter, depression in youth will be overviewed. First, a discussion of the classification, diagnosis, and assessment of depression will be presented followed by a brief review of the epidemiological and theoretical aspects of depression. Next, the major risk factors that have been identified with depression in children and adolescents will be reviewed. Finally, a rationale for the current study will be given, along with specific questions to be examined.

Historical Development of the Construct of Childhood Depression

The study of depression dates back to the time of Hippocrates (Schachter & Romano, 1993). From the very first accounts of what is now called “depression”, up until very recently, there has been debate about whether this disorder of mood can occur in children (Parry-Jones, 2001; Poznanski & Mokros, 1994). The main resistance to the idea that children could experience depression arose from the conceptualization of depression forwarded by the psychoanalysts such as Freud, who viewed depression as a disorder of the superego (Moreau, 1996), which, in children, was believed to be undeveloped (Parry-Jones, 2001).

In the 1960s, people began to believe that children experienced “masked depression” (i.e., exhibiting depression through symptoms such as hyperactivity, bed-wetting, somatic complaints and behavior problems, instead of through symptoms consistent with depression in adults) (Kolvin & Sadowski, 2001; Moreau, 1996; Schachter & Romano, 1993). It was not until the 1970s that researchers began to demonstrate that children do experience and display depression in ways similar to adults (Essau, Petermann, & Reynolds, 1999). Finally, in 1980, when the third edition of the

Diagnostic and Statistical Manual (DSM-III) included diagnostic criteria for childhood depression under the umbrella of adult depression, the view of childhood depression as similar to depression in adults was integrated into mainstream psychology and psychiatry (Essau, Petermann, et al., 1999).

Progress toward understanding child and adolescent depression is no longer hampered by doubts about its existence. It is now widely acknowledged that depression is relatively common in children and adolescents, exhibited by up to 6% of school-age children (see Kessler et al., 2001), and up to 8.3% of adolescents in the general population (see Muris, Schmidt, Lambrichs, & Meesters, 2001). Childhood and adolescent depression is now viewed as a persistent and serious disorder, associated with a variety of adverse consequences (Cicchetti & Toth, 1998).

The Classification of Depressive Disorders

In the latest edition of the DSM, (the DSM-IV-TR), several different categories of depressive disorders are defined, including Major Depressive Disorder (MDD), Dysthymic Disorder, and Bipolar Disorders (American Psychological Association, 2000). The focus of this study is on MDD, and as such, the other categories depressive disorders will not be discussed.¹

According to the DSM-IV-TR, a diagnosis of MDD can be conferred when at least 5 of 9 different symptoms are present during a 2-week period; it is mandatory that one of the 5 symptoms be depressed mood (which can be irritable mood for children and adolescents). The other symptoms include anhedonia, significant weight change (or failure to make expected weight gains in children), sleep disturbance, psychomotor

¹ The term depression will be used in reference only to MDD throughout this document.

retardation or agitation, fatigue or loss of energy, feelings of worthlessness or inappropriate guilt, diminished ability to concentrate, and recurrent thoughts of death (American Psychological Association, 2000).

As is clearly evidenced by these diagnostic criteria, the contemporary conceptualization of depression is that of a disorder expressed similarly across the lifespan (Garber & Flynn, 2001a; Poznanski & Mokros, 1994). Although a few concessions are made for age-specific symptoms (for example, irritability), the use of a common set of criteria to diagnose depression across childhood, adolescence, and adulthood is the current standard of diagnostic practice (Frick & Silverthorn, 2001).

However, the conceptualization of depression as analogous across the lifespan is not without controversy and opposition (Essau, Petermann, et al., 1999; Poznanski & Mokros, 1994). Particular opposition to this view has come from developmental psychopathologists, who contend that depression is manifested differently at each phase of development (Schwartz et al., 1998). Some posit that the expression of depression is likely to vary as a function of an individual's cognitive, social, and physiological development, and as such, diagnostic criteria should be created that are sensitive to developmental changes in these domains (Garber & Flynn, 2001a; Schachter & Romano, 1993). Others suggest that because cognitive and physiological development differs considerably across developmental phases, depression in childhood, adolescence, and adulthood may be comprised of unique symptom combinations, and hence may actually be three distinct and separate disorders (Garland & Weiss, 1995; Guarian, 1993; Hammen & Garber, 2001; Kaufman, Martin, King, & Charney, 2001).

Those on the other side of this debate, who subscribe to the notion that the conceptualization of depression created for adults can be applied equally well to children, cite research demonstrating that the symptom profiles of depressed children, adolescents, and adults are more similar than different (Frick & Silverthorne, 2001; Kovacs, 1998; Kovacs, Obrosky, & Sherrill, 2003; Ryan, 2001). For example, a recent study comparing the symptom prevalence rates of depressed adolescents and adults found no systematic differences between the symptoms of these developmentally-different groups (Lewinsohn, Pettit, Joiner, & Seeley, 2003).

At this point, a definitive conclusion regarding the appropriate diagnostic criteria for children has not been reached. Researchers reviewing the field of child and adolescent depression are beginning to point out that it is still unclear whether the presentation of MDD varies with age to a significant degree, and whether child, adolescent, and adult depression are really the same disorder (Alpert et al., 1999; Hammen & Garber, 2001; Kaufman et al., 2001; Nurcombe, 1994; Poznanski & Mokros, 1994; Voelker, 2003). What does seem clear is that MDD is a very heterogeneous disorder (Gotlib & Sommerfield, 1999; Shenal, Harrison, & Demaree, 2003), its range of symptoms not yet fully understood (Joiner, 2000).

Developmental Considerations

Although the debate regarding the appropriate diagnostic criteria for childhood and adolescent depression continues, there are specific depressive symptoms viewed as particular to each developmental level. In infancy, depression is characterized by a deprivation reaction similar to the reaction seen in infants who have been separated from their primary caregivers (Schwartz et al., 1998). In the preschool years, depression is

typified mainly by a disturbance in mood, such as anger, irritability, or excessive crying (Gotlib & Sommerfeld, 1999). Between the ages of 6 and 8, depression tends to be denoted by behavior problems and withdrawal (Schwartz et al., 1998). By the time children have reached the age of 12, they begin to verbalize feelings of low-self esteem and hopelessness (Gotlib & Sommerfeld, 1999; Schwartz et al., 1998). In adolescence, depressive symptoms become most similar to those reported in adulthood (Schachter & Romano, 1993), with suicidal ideation becoming more common (Gotlib & Sommerfeld, 1999). Sleep and weight changes, and feelings of worthlessness and hopelessness, are reported at a much higher rate after childhood (Frick & Silverthorne, 2001; Kovacs, 1998; Moreau, 1996)

Assessment of Depression

Many different methods of assessing and measuring depressive symptoms are being widely used at the present time. The major categories of instruments used to assess depression in children and adolescents include: diagnostic interview, ratings by significant others, direct observations, and self-report scales (Essau, Hakim-Larson, Crocker, & Petermann, 1999; Schwartz, et al., 1998).

Diagnostic Interview Schedules

The following are examples of commonly employed diagnostic interview schedules: Diagnostic Interview for Children and Adolescents, Kiddie-Schedule for Affective Disorders and Schizophrenia, Child Assessment Schedule, and Child and Adolescent Psychiatric Assessment (Essau, Hakim-Larson, et al., 1999; Hodges, 1994; Ryan, 2001). The use of diagnostic interviews provides clinicians with opportunities for observation, and for depth and breadth of investigation (Clarizio, 1994). Additionally,

diagnostic interview schedules typically include explicit rules regarding symptom frequency and duration required for a diagnosis of MDD, reducing ambiguity for clinicians (Kessler et al., 2001). However, when assessing young children, who cannot accurately report their own symptoms, a large time investment is required, as there is a need to interview primary caregivers as well the child (Schwartz et al., 1998). Diagnostic interviews are best used in situations where a formal diagnosis is sought (Silverman & Serafini, 1998).

Ratings by Significant Others

Ratings by significant others are also commonly used to assess depression (Essau, Hakim-Larson et al., 1999; Schwartz et al., 1998). This assessment method allows adults to provide information about symptoms, such as changes in eating and sleeping habits, that children may not be capable of observing in themselves (Kazdin & Marciano, 1998). On the other hand, significant others are not able to report on unobservable symptoms, such as feelings of guilt and extreme sadness, frequently found in children who are depressed (Clarizio, 1994).

Examples of commonly used rating scales for parents and teachers of potentially depressed children include: Personality Inventory for Children, Child Behavior Checklist (Clarizio, 1994), Behavior Assessment System for Children (Essau, Hakim-Larson, et al., 1999), and Connors Parent Rating System (Silverman & Serafini, 1998). These rating scales would be considered the best method of assessment when the goal is to identify and quantify behavior (Silverman & Serafini, 1998).

Direct Observation

Direct observation is a technique that is sometimes used during the assessment of depression, although this practice is often unstandardized and subjective (Kazdin & Marciano, 1998). In particular, three types of behavior are typically the focus of the observation, namely social activity, solitary behavior, and affect-related expression (Essau, Hakim-Larson, et al., 1999; Silverman & Serafini, 1998). Observational methods are considered the best assessment choice when the goal is to determine the presence or absence of overt behaviors related to depression (e.g., sad facial expression, diminished social and physical activity, etc.) (Clarizio, 1994).

Self-Report Questionnaires

Self-report questionnaires are frequently chosen to assess depression in children and adolescents. Examples of commonly used instruments include Children's Depression Inventory, Children's Depression Scale, Depression Self-Rating Scale, Centre for Epidemiological Studies – Depression Scale, Adolescent Psychopathology Scale: Major Depression and Dysthymia Scales (Reynolds, 1994), Dimensions of Depression Profile for Children and Adolescents, and Children's Depression Adjective Checklists (Essau, Hakim-Larson, et al., 1999). Due to the fact that a self-report scale was used to assess depressive symptoms in the current study (see Chapter III), a detailed discussion of the strengths and weaknesses of self-report questionnaires in the assessment of depression is presented next.

Although not considered adequate for the diagnosis of depression (Schwartz et al., 1998), self-report questionnaires have great utility in identifying and evaluating the severity of depressive symptoms (Reynolds, 1994; Silverman & Serafini, 1998). Self-

report scales are considered especially useful in the context of depression, as many symptoms of depression are not easily observed by others (Reynolds, 1994; Schwartz et al., 1998). In fact, self-report is the most widely used method to assess depression in both research and clinical settings (Silverman & Serafini, 1998).

However, this assessment method is not considered ideal for children under the age of 10, as they have limited memory capacity and communication skills (Clarizio, 1994), and often lack the metacognitive skill to evaluate and report their own symptoms accurately (Nurcombe, 1994). Therefore, the use of self-report questionnaires is limited to older children and adolescents (Kessler et al., 2001). The use of self-report questionnaires is also constrained by an individual's reading ability and language comprehension, and does not provide the clinician with an opportunity to determine whether reported symptoms such as weight loss or sleep changes are caused by depression, or by another unrelated factor or factors (Reynolds, 1994). Additionally, information gleaned from self-report questionnaires lacks corroboration by other sources, such as parents or teachers.

Although such corroboration is always desirable when assessing any psychological disorder, the issue of informant variability is very real in the assessment of child and adolescent depression. Agreement between parents' and children's ratings of depressive symptoms has been found to be low to moderate, a finding that does not appear to vary systematically with age (Kazdin, 1994; Rice, Harold, & Thapar, 2002; Rubio-Stipec, Fitzmaurice, Murphy, & Walker, 2003). Even when researchers have attempted to increase this level of agreement, correlations have remained only moderate (Nguyen et al., 1994).

This relatively low level of agreement between parents and youth can be partially attributed to the fact that only the child or adolescent can accurately report on his or her own experience of the internal symptoms related to depression (Ryan, 2001; Schwartz et al., 1998). Accordingly, research has shown that when child and parent ratings of child depression were compared, youths were found to report significantly more symptoms than did parents (Garber, Keiley, & Martin, 2002; Rubio-Stipec et al., 2003). As a general rule, it has been suggested that parents' and teachers' ratings be given more weight when assessing externalizing behaviors, whereas children/adolescents' ratings be given more credibility when internalizing behaviors are being reported (Kazdin, 1994; Schwartz et al., 1998).

Epidemiological Information

Prevalence

The lifetime prevalence of MDD has been estimated at approximately 20% (Joiner, 2000; Muris et al., 2001), and is reported to be increasing (Cicchetti & Toth, 1998; Kazdin & Marciano, 1998; Joiner, 2000). In fact, depression is considered by some to be an epidemic (Joiner, 2000). It has been projected that by the year 2020, depression will become the second leading cause of disability in the world (see Benjet & Hernandez-Guzman, 2002), meaning that efforts towards prevention are crucial. In the current study, the aim is to inform such prevention efforts, by identifying salient risk factors for depression.

MDD is experienced by less than 1% of preschool-age children in the general population (see Essau & Dobson, 1999). For school-age children, the prevalence rate in community samples has been listed as anywhere from less than 1% (Cicchetti & Toth,

1998) to 6% (see Kessler et al., 2001). In adolescents, the prevalence of MDD has been estimated to be between 0.4% and 8.3% (see Muris, Schmidt, Lambrichs, & Meesters, 2001). It is important to note however, that reports of prevalence rates do differ across studies; these differences have been attributed to the use of different methods, or different informants, in the assessment of depression (Bachanas & Kaslow, 2001; Garber & Flynn, 2001a; Merikangas & Avenevoli, 2002).

Onset

The first episode of depression most frequently emerges during late childhood or early adolescence (see Essau & Dobson, 1999, and Kovacs, 1998). Consequently, it is approximately this time in development that rates of depression increase dramatically (see Schwartz et al., 1998 and Seiffge-Krenke & Stemmler, 2002). Rates of depression continue to rise into early adulthood (Kessler et al., 2001).

Sex Ratio

During the rise in depression rates throughout adolescence, it is females who report much higher rates of depression in comparison to males (Benjet & Hernandez-Guzman, 2002; Cole et al., 2002; Garber, Keiley, & Martin, 2002; Holsen, Kraft, & Vitterso, 2000; Laitinen-Krispijn, van der Ende, & Verhulst, 1999; Marcotte, Fortin, Potvin, & Papillon, 2002; Muris et al., 2001; Rubio-Stipec, et al., 2003; Silberg et al., 1999). In fact, the female predominance in depression rates after childhood is considered one of the most robust findings to date in the field of epidemiological research (Wade, Cairney, & Pevalin, 2002), and cannot be attributed to gender differences in reporting, or recall, of depressive symptoms (Piccinelli & Wilkinson, 2000).

However, the particular age range at which the female population begins to experience significantly more depression than males is unclear. Some researchers report that depressed females begin to significantly outnumber depressed males by the age of 12 or 13 (Angold et al., 2002; Benjet & Hernandez-Guzman, 2002; Cole et al., 2002; Ge, et al., 1994; Holsen et al., 2000; Laitinen-Krispijn et al., 1999; Silberg et al., 1999). Others have not found a significant difference between the genders until the age of 14 or 15 (Garber et al., 2002; Seiffge-Krenke & Stemmler, 2002; Wade et al., 2002).

Although there is no question that adolescent and adult females significantly outnumber their male peers in depression rates, there are conflicting reports regarding gender differences in prevalence during childhood. Prior to adolescence, some studies report no sex differences in the prevalence of depression (Duggal, Carlson, Sroufe, & Egeland, 2001; Silberg et al., 1999; Wade, et al., 2002), whereas others have found that it is boys who outnumber girls in depression rates at this time in the lifespan (Garber, et al., 2002; Ge, Lorenz, Conger, Elder, & Simons, 1994).

Furthermore, there are also inconsistent findings regarding the trajectory of depression in adolescent and adult males. During adolescence, some studies report that the rate of depression in males does not rise from childhood levels (Ge, et al., 1994; Holsen, et al., 2000), whereas others have found that these rates actually decrease with age (Angold, Erkanli, Silberg, Eaves, & Costello, 2002; Benjet & Hernandez-Guzman, 2002; Laitinen-Krispijn et al., 1999).

Course

It has been reported that in general, the duration of a depressive episode in children and adolescents is shorter than that of adults (Kovacs, 1998). In contrast to

adults, who exhibit a mean episode length of 12 months (Kovacs, 1998), the average time to recovery for children and adolescents is 8-9 months (Garber & Flynn, 2001a; Schwartz et al., 1998).

Depressive episodes are known to recur in children and adolescents, at a rate of approximately 70% (Birmaher, Arbelaez, & Brent, 2002; Kovacs, 1998). Longitudinal, retrospective studies have shown evidence that depression in childhood persists into adolescence and beyond (Duggal et al., 2001; Kessler et al., 2001; Zeitlin, 2000). The stability of depression scores appears to increase over time, from relatively unstable in early adolescence, to relatively stable by late adolescence (Garber et al., 2002; Holsen et al., 2000), suggesting that the longer depression lingers, the higher the likelihood that a depressive pattern will be established. Furthermore, the neurobiological changes associated with depression may be enhanced with each depressive episode (see Kaufman et al., 2001, for a discussion). Some researchers have even suggested that the index episode of MDD is the beginning of a chronic and lifelong disorder (Birmaher et al., 2002).

Early-onset depression appears to be most problematic, as MDD in childhood is associated with elevated risk for developing MDD in adolescence, which in turn creates increased risk for MDD in adulthood (Birmaher et al., 2002; Kessler et al., 2001; Zeitlin, 2000). Those with early-onset MDD are at considerable risk of developing Bipolar Disorder (Birmaher et al., 2002; Essau, Conradt, & Petermann, 1999; Kovacs, 1998), and exhibit a higher rate of comorbidity than those with later-onset MDD (Alpert et al., 1999). Additionally, depressed children and depressed adults often experience similar adverse outcomes (outcome is discussed in more detail later), but on average, individuals

with early-onset depression exhibit these outcomes 20 years earlier (Kovacs, 1998). In particular, boys seem to be most negatively affected by early-onset depression, as they tend to demonstrate higher rates of comorbidity than girls who experience depression early in life (Kovacs et al., 2003).

Comorbidity

MDD is seldom uncomplicated in childhood and adolescence (Alpert et al., 1999; Avenevoli, Stolar, Li, Dierker, & Merikangas, 2001; Brockless, 1997; Kovacs, 1998; Reynolds & Johnston, 1994). It has been reported that up to 70% of MDD cases will present with a comorbid disorder (Avenevoli et al., 2001; see also Cicchetti & Toth, 1998). Between 80% to 95% of comorbid diagnoses in depressed youth are on Axis I (Alpert et al., 1999) or Axis II of the DSM classification system (Kovacs, 1998).

The disorders most commonly found in depressed children and adolescents include anxiety disorders, conduct problems, Attention Deficit/Hyperactivity Disorder (AD/HD), eating disorders, and substance-abuse disorders (Angold & Costello, 1993; Kovacs et al., 2003; see also Moreau, 1996 and Reynolds & Johnston, 1994). Although anxiety is the disorder most frequently associated with depression (Merikangas & Avenevoli, 2002; Piccinelli & Wilkinson, 2000), conduct disorder is also quite often comorbid with depression in children (Roberts, 1999), in fact, up to 83% of the time (Merikangas & Avenevoli, 2002). Most researchers and reviewers report that comorbid diagnoses precede the onset of MDD in childhood (Angold & Costello, 1993; Avenevoli et al., 2001; Cicchetti & Toth, 1998; Merikangas & Avenevoli, 2002).

In the domain of comorbidity, a few questions remain unanswered. First, there is the question of whether or not MDD with comorbidity actually constitutes a different

form of depression than “pure” MDD (Angold & Costello, 1993; Brockless, 1997; Kovacs, 1998; Rice et al., 2002). Second, it is unclear if depression and anxiety are really separate disorders, or whether anxiety is simply a precursor to MDD (Avenevoli et al., 2001; Breslau, Chilcoat, Peterson, & Schultz, 2000; Rice et al., 2002)

It has been consistently demonstrated though, that the presence of comorbid diagnoses is associated with increased risk for recurrent episodes of depression, prolonged episode duration, and more severe depressive symptoms (Cicchetti & Toth, 1998; Merikangas & Avenevoli, 2002). Comorbidity has also been found to increase impairment across multiple domains of functioning, and the probability of negative, maladaptive outcomes (Bachanas & Kaslow, 2001; Kovacs et al., 2003). Due to the high incidence of comorbidity associated with MDD, childhood and adolescent depression can often culminate in a substantial developmental interruption, across multiple domains.

Outcome

Adults with a history of MDD have been found to have increased levels of substance abuse, suicidal behaviors, and interpersonal problems, discontinuity of employment, increased use of mental health services, school drop-out (Bachanas & Kaslow, 2001; Birmaher et al., 2002; Essau, Conradt, et al., 1999; Kessler et al., 2001; Roberts, 1999), life-stress generation (Rudolph et al., 2000; Williamson, Birmaher, Anderson, Al-Shabbout, & Ryan, 1995), and comorbid mental disorders (Alpert et al., 1999). Depressed children frequently exhibit poor concentration, diminished thinking ability, decreased productivity, fatigue, and psychomotor retardation or agitation, often leading to poor grades and academic problems (Reynolds & Johnston, 1994). As noted above, MDD sometimes evolves into Bipolar Disorder, a more serious form of depressive

psychopathology, later in life; one review reported that as many as 20% to 40% of children and adolescents with depression may experience a manic episode within 5 years of onset (Kaufman et al., 2001).

The epidemiological data on childhood and adolescent depression paints a bleak picture for those who develop this disorder. It seems then, that prevention is the best, and perhaps only, way to avoid the sometimes life-altering consequences of depression. However, without knowledge of the causes of depression, prevention becomes a considerable challenge.

Overview of Theories of Depression

The cause(s) of depression at any age is not yet known for certain (Kazdin & Marciano, 1998; Shenal et al., 2003). In particular, research into the etiology of MDD in childhood is lacking, as the body of knowledge accumulated regarding childhood depression has not progressed far beyond the delineation of diagnostic characteristics and prevalence (Beardslee & Gladstone, 2001; Graham & Easterbrooks, 2000). Most existing efforts to explain the etiology of childhood MDD have been concentrated on the downward extension of theories created to explain adult depression, rather than on the development of theories specific to depression in children (Gotlib & Sommerfeld, 1999; Hammen & Garber, 2001). Similar to the debate regarding the application of adult diagnostic criteria to children (described previously), there is disagreement about the utility of adult etiological theories in explaining childhood depression, due in large part to the remaining question of whether or not depression is analogous across the lifespan (Gotlib & Sommerfeld, 1999; Gurian, 1993; Turner & Cole, 1994).

Many different etiological theories can be found in the literature, numbering at least 30 (Street, Sheeran, & Orbell, 1999). A detailed discussion of all these theories is beyond the scope of this discussion. Instead, only the major models of depression etiology will be overviewed below.

Cognitive Models

Cognitive theories put forth to explain the development of depression focus on the interaction between maladaptive beliefs, inferential styles, or biases in information processing, and negative life events (Alloy, 2001). Beck's theory of the negative cognitive triad states that people who hold distorted, negative views of themselves, the world around them, and the future, will experience depression when they encounter a major loss or stressor (Rehm, Wagner, & Ivens-Tyndal, 2001; Williams, 1997).

Abramson's hopelessness theory, a reformulation of Seligman's learned helplessness theory (described later), posits that people who attribute negative life events to stable and global causes will become hopeless (i.e., believing that desirable outcomes will not occur, and aversive outcomes will occur), and subsequently, depressed (Gotlib & Sommerfeld, 1999; Joiner, 2000).

The response styles theory is a more recent theory put forth by Nolen-Hoeksema. According to this theory, those who ruminate about their negative feelings and the causes and consequences of these feelings (a ruminative response style), are more likely to become depressed than those who distract themselves from their feelings of negativity (a distracting response style) (Ziegert & Kistner, 2002).

Behavioral Models

There are several behavioral models that have gained wide recognition, all of which concentrate on learning, environmental outcomes, and skill deficits (Kazdin & Marciano, 1998). In a theory posited by Lewinsohn, individuals exhibiting deficient social skills are perceived as behaving aversively by others, and as a result, are avoided by peers. Consequently, socially inept individuals receive low levels of positive reinforcement from their social environment (Garland & Fitzgerald, 1998; Segrin, 2000). Depression is said to develop in response to this lack of positive social reinforcement (Williams, 1997).

A second behavioral theory, Seligman's learned helplessness theory, was created from a model of animal behavior (Gotlib & Sommerfeld, 1999). It was found that dogs exposed to inescapable shock developed a perception that there was no relationship between response and outcome, and subsequently became passive, demonstrating weight loss and a decrease in appetite (Rehm et al., 2001). It was proposed that human depression paralleled the reaction of these dogs, in that the perception of helplessness results in symptoms consistent with depression (Gurian, 1993). As described above, this model was later reformulated to add a cognitive component, into the hopelessness theory (Gotlib & Sommerfeld, 1999).

Cognitive-Behavioral Models

One well known cognitive-behavioral model is Rehm's self-control theory, which represents an attempt to integrate aspects from theories by Lewinsohn, Beck, and Seligman (Rehm et al., 2001). According to this theory, people who are depressed have distortions in self-monitoring, self-evaluation, and self-reinforcement (Schwartz et al.,

1998). People who become depressed selectively attend only to the negative aspects of themselves and their world, set impossible standards for their own behavior, and tend to decrease self-reward and increase self-punishment (Williams, 1997).

Interpersonal Models

In these models, the role of social relationships is emphasized, and deficits in contact with parents, parental warmth, and attachment bond are cited as causes for depression (Kazdin & Marciano, 1998). In particular, in Coyne's interactional theory (see Segrin & Abramson, 1994, for a discussion) of depression, it is stated that the social interaction of depressed individuals often induces a negative mood in others. This negative mood leads others to feel hostile, and thus reject socially incompetent individuals. Being rejected then creates or confirms a negative view of self, and causes depression (Segrin & Abramson, 1994). This theory has many similarities to Lewinsohn's previously described social skills theory of depression (Segrin, 2000).

Biological Models

Potential biological causal factors for depression include genetic factors, neurological factors, endocrine system dysfunction, and sleep abnormalities (Kazdin & Marciano, 1998; Rehm et al., 2001). Those investigating genes as a causal factor have documented a two- to four-fold increase in depression prevalence in children with depressed parents (see Rice et al., 2002). Deficiencies in neurotransmitters have also been blamed for the development of depression, including norepinephrine, serotonin, dopamine, and catecholamines (Rehm et al., 2001). The endocrine systems that have been studied for their connection to depression include thyroid function, insulin tolerance,

growth hormone, somatostatin, prolactin, and endorphins (Garber & Flynn, 2001a; Rehm et al., 2001).

Psychodynamic Models

All psychodynamic models of depression etiology implicate the ego and superego, narcissism, or the unconscious needs (Kazdin & Marciano, 1998). In Freud's early conceptualization of depression, it is proposed that the loss of an unconscious object, such as a part of one's self, gives rise to feelings of anger and self-reproach. This self-loathing leads to symptoms consistent with depression (Street et al., 1999). The concept of the "depressive personality" would also fall under the umbrella of psychodynamic theory (Rehm et al., 2001).

Risk Factors for Depression

The many different theories on the etiology of depression have given rise to a large body of research on risk factors for child and adolescent depressive symptomology. A vast number of different risk factors have been examined; each with its roots in one of the various theories described above. Research on the identification of risk factors is crucial, for many reasons. Depression rates are on the rise, depression often onsets in late childhood, is chronic, and is associated with high comorbidity, risk for suicide, negative developmental consequences, and serious impairments across multiple domains (Beardslee & Gladstone, 2001; Cicchetti & Toth, 1998; Garber & Flynn, 2001a; Graham & Easterbrooks, 2000; Holsen et al., 2000; Kessler et al., 2001; Muris et al., 2001; Sheeber, Hops, & Davis, 2001; Ziegert & Kistner, 2002). With an understanding of childhood risk factors, better-informed and more effective prevention initiatives can be

mounted, perhaps allowing some children to circumvent this disorder, and its negative consequences, entirely.

There is a large group of variables, some biological and some environmental, that have been consistently associated with depression across populations (Herman-Stahl & Peterson, 1999). However, this area of research is still very young, and many questions remain. In this study, a major goal is to consolidate knowledge from numerous studies conducted on this topic in recent years, in an attempt to enhance the current understanding of risk factors for depression in youth. To that end, the next section of this chapter consists of a current review of the major risk factors that have been associated with depression.

Issues of Definition

The terms “risk factor” and “vulnerability factor” are both used in literature on variables associated with the development of depression, and therefore must be defined prior to any discussion of the two. These two terms are often used interchangeably, but some researchers in the field argue that the two are not synonymous (Ingram & Price, 2001). The term “risk factor” refers to any condition that increases or predicts the likelihood of maladaptation, or is associated with a heightened probability of disorder (Ingram & Price, 2001; Steinhausen & Winkler-Metzke, 2001).

The term “vulnerability factor” is less clearly defined. Some state that this term refers to stable, enduring traits residing within the individual, that often manifest themselves in the presence of stress (Ingram & Price, 2001); whereas others claim that long-standing environmental influences (residing outside the individual) can also be classified as vulnerability factors (Steinhausen & Winkler-Metzke, 2001).

Currently, the terms “risk” and “vulnerability” are used with some confusion (Price & Lento, 2001). Regardless, most agree that risk and vulnerability work in concert, with risk factors triggering vulnerability factors to result in disorder (Ingram & Price, 2001). In light of this lack of clarity, from this point onward, research examining either risk and vulnerability factors will not be differentiated, and all factors discussed will be referred to as “risk factors”.

Two other terms relevant to this discussion are “mediators” and “moderators” of risk. A variable “mediates” the effect of a given risk factor when its presence explains the association between the risk factor and the outcome (El-Sheikh & Flanagan, 2001). In other words, a mediating variable provides insight into how or why certain relationships occur (Baron & Kenny, 1986).

On the other hand, a variable “moderates” the effect of a given risk factor when its presence influences the direction and/or strength of the association between the risk factor and the outcome (El-Sheikh & Flanagan, 2001). In other words, with or without the presence of a moderator, a relationship between the risk factor and the outcome would be found, but a moderator provides insight into a variable that makes that relationship weaker or stronger.

Parental Depression

Parental depression is a well-studied predictor of child and adolescent depression (Diego, Sanders, & Field, 2001). A vast number of studies have reported parental depression to be one of the strongest predictors of child and adolescent MDD (for examples see Connell & Goodman, 2002; Diego et al., 2001; El-Sheikh & Flanagan,

2001; Garber et al., 2002; Graham & Easterbrooks, 2000; Hair, McGroder, Zaslow, Ahluwalia, & Moore, 2002; Hammen, 2000; Hammen, Shih, Altman, & Brennan, 2003).

The strong evidence for the significance of parental depression as a risk factor for depression in offspring has been compelling enough for recent reviewers to suggest that others in the field move beyond the question of “if” parental depression creates risk for depression in children, and begin to examine “how” this risk is transmitted (Gotlib & Goodman, 2002). At this point, it is unclear whether the risk to offspring of depressed parents is due to the high heritability of MDD, or to environmental factors associated with parental depression, including a negative parenting style, or negative interpersonal or cognitive modeling (Graham & Easterbrooks, 2000; Hammen, 2000; Kim & Ge, 2000; McCauley & Myers, 1992).

Negative Life Events/Life Stress

Depression in children and adolescents has been consistently predicted by the presence of stressful life events (Frick & Silverthorn, 2001; Goodman, Gravitt, & Kaslow, 1995; Roberts, 1999). The effects of negative life events are reported to vary by gender after childhood, with adolescent females experiencing more depression in the face of life stress than adolescent males (Ge et al., 1994; Marcotte et al., 2002; Rudolph et al., 2000). This finding, and many others that will be reported throughout this section, lends support to the suggestion that there may be gender-specific pathways to depression.

Increasing evidence points to the possibility that specific types of life events or life stress are more strongly predictive of depression than others (Meyer, Garrison, Jackson, Addy, McKeown, & Waller, 1993; Turner & Cole, 1994). A few researchers have found that “independent” life events (i.e., those over which the child or adolescent

has no control, such as the death of a parent) are significantly related to depression (Ge et al., 1994; Herman-Stahl & Peterson, 1999). On the other hand, researchers comparing the effects of both “independent” and “dependent” life events (i.e., those events that the child or adolescent plays a role in creating, such as conflict with peers, or failing a test) have made an important discovery: dependent events have a stronger association with depression (Rudolph et al., 2000; Seiffge-Krenke & Stemmler, 2002; Silberg et al., 1999; Williamson et al., 1995).

Where more detailed analysis has been conducted, it has been shown that dependent events of an interpersonal nature (conflicts with peers and/or family members) are the most frequent forms of life stress in depressives, relative to all other categories of stress, both dependent and independent (Hammen, 2000; Hammen et al., 2003; Rudolph et al., 2000; Seiffe-Krenke & Stemmler, 2002). Therefore, given that interpersonal stress appears to have a particular association with depression in children and adolescents, this specific domain of negative life stress will be examined in further detail next. The relationship of problematic peer relationships to depression will be addressed first, followed by a discussion of the association between negative parent-child relationships and depression in youth.

Peer Relationships

Children who report chronic social difficulties exhibit higher rates of depression than children who report no such problems (Hammen et al., 2003). Depressed children and adolescents display higher levels of hostility toward peers, and lower levels of social skill, than their non-depressed age-mates (Beam, Gil-Rivas, Greenberger, & Chuansheng, 2002; Beardslee & Gladstone, 2001; Garland & Fitzgerald, 1998; Rudolph, Hammen, &

Burge, 1994; Tani, Chavez, & Deffenbacher, 2001). Depressed youth have been reported to demonstrate problematic social interactions across studies, regardless of whether the informant was the children themselves, their teachers, their parents (Bell-Dolan, Reaven, & Peterson, 1993), or trained observers (Segrin, 2000; Segrin & Abramson, 1994). Some studies report that problematic interpersonal relationships are more closely tied to depression in girls, compared to boys (Hankin & Abramson, 2001; Rudolph et al., 2000).

Furthermore, children with high depression scores exhibit deficient social problem-solving abilities (i.e., the ability to cope with and effectively respond to everyday social problems) relative to their non-depressed peers (Frye & Goodman, 2000; Goodman et al., 1995; Rudolph, et al., 1994). In addition, self-reported popularity, friendship quality, loneliness (Diego et al., 2001; Nangle, Erdley, Newman, Mason, & Carpenter, 2003) and perceived peer rejection (Nolan, Flynn, & Garber, 2003) have all been found to significantly predict child and adolescent depression.

Parental Rearing Behavior

A chronic and inescapable source of life stress (Sagrestano, et al., 2003; Sheeber et al., 2001) that may have an even greater impact on youth than negative peer relationships (Steinhausen & Winkler-Metzke, 2001) is problematic parental rearing behavior. A parent demonstrating rejection, over-control, harshness, neglect, or unpredictability may lead a child to believe that he or she is powerless, worthless, or isolated, and to view the world as harsh and unpredictable; in other words, to develop cognitive characteristics consistent with depression (Duggal et al., 2001; Garber, Robinson, & Valentiner, 1997; Muris et al., 2001; Steinhausen & Winkler-Metzke, 2001).

Several different aspects of parenting have been examined in relationship to depression. Perceived parental warmth/nurturance/support, and perceived parental rejection are two variables that have received particular attention, as retrospective studies of depressed adults consistently demonstrate that these individuals experienced their parents as rejecting and inattentive (see Garber, Robinson, & Valentiner, 1997; McCauley & Myers, 1992; and Muris et al., 2001).

With regards to parental rejection, depressed early adolescents have been found to report significantly higher levels of perceived parental rejection than their typical peers (Muris et al., 2001; Robertson & Simons, 1989). Perceived parental rejection has been reported to be a primary source of depression in structural equation models (Muris et al., 2001), and to be a significant predictor of early adolescent depression (Garber et al., 1997; Nolan et al., 2003; Robertson & Simons, 1989; Steinhausen & Winkler-Metzke, 2001). Perceived parental indifference, a closely related construct, has also predicted depression in early adolescence (Liu, 2003).

With regards to parental warmth and support, this variable has also been found to explain unique portions of variance in adolescent depression scores (Beam et al., 2002; Herman-Stahl & Petersen, 1999). Several closely related constructs, specifically perceived parental nurturance and care, and perceived family cohesion (i.e., the extent to which family members have warm emotional ties), are also reported to be significantly lower in depressed early adolescents, relative to their non-depressed peers (Aydin & Oztutuncu, 2001; Liu, 2003).

Although some studies have found no indication of sex differences in the effect of parental rearing behavior on depression (Garber et al., 1997; Lau & Kwok, 2000), other

studies have reported that sex differences exist. For example, one study found that the depression scores of girls were predicted by both parental care and parental indifference, whereas the scores of boys were predicted only by parental care (Liu, 2003). Also, perceived parental warmth and support has been rated by independent observers as significantly lower in the families of girls, but not boys, who are depressed (Ge et al., 1994). After reviewing the empirical evidence on the relationship between negative parental rearing behavior and depression in 2001, Sheeber, Hops, and Davis concluded that the evidence on whether males and females are impacted differently by negative parental rearing behavior is currently mixed.

Perceived over-controlling parenting style is another aspect of parenting behavior that has been investigated for its relationship to child and adolescent depression. This type of parenting orientation not been found to be higher in depressives (Aydin & Oztutuncu, 2001), and has not emerged as a unique predictor of depression (Garber et al., 1997; Liu, 2003).

Lastly, perceived family relationship quality, a broader construct, has been found to significantly predict depression in adolescents (Diego et al., 2001; Lau & Kwok, 2000). However, it is important to note that in a study conducted by Duggal et al. (2001), in which observers rated the quality of family relationships, objective ratings were not found to be predictive of depression. Furthermore, Sagrestano et al. (2003) found that children's ratings of family conflict significantly predicted their own depression, whereas parents' and observers' ratings of family conflict were not significant predictors of these children's depression scores.

This last set of findings raises an important issue that should be addressed at this point, that is, the use children's or adolescents' perceptions of parental rearing behavior to predict depression. In the majority of the studies described above, it was the perceptions of youth that were studied, rather than potentially more objective ratings by other informants, or independent observers. However, in the few studies that did include parent and observer ratings, these ratings had inferior utility in the prediction of depression scores relative to children's or adolescents' perceptions of parental rearing behavior.

The use of only children's or adolescents' perceptions of parental rearing behavior to predict their own depression scores does invite the problems of common method variance (i.e., a portion of explained variance is attributed to the use of a unitary and biased data source, in this case the participants, hence a source of error variance is introduced into a statistical analysis). However, it is important to consider that children's or adolescents' perceptions of reality, regardless of possible flaws in these perceptions, are potentially the most indicative of their subsequent cognitive, emotional, and behavioral reactions than objective measures of "actual" reality (Beam et al., 2002; Garber & Flynn, 2001b; Kim & Ge, 2000; Sagrestano et al., 2003; Steinhausen & Winkler-Metzke, 2001). For this reason, some have recommended that the perceptions of older children and adolescents are the most crucial environmental measures to include when investigating the impact of environmental variables on child functioning (Wierson & Forehand, 1992).

In summary, negative parental rearing behavior appears to be closely tied to depression in offspring. Furthermore, negative parental rearing behavior may impact

upon the psychological health of children not just directly, but also indirectly, through its effects on children's self-esteem (Sheeber et al., 2001). Perceived parental rearing behavior has been found to predict self-esteem (Garber & Flynn, 2001b), and as will be described next, self-esteem is a significant predictor of depression. Perceived parental rejection (Robertson & Simons, 1989), and perceived family relationship quality (Lau & Kwok, 2000) have also been associated with both depression and self-esteem. Studies employing structural equation modeling techniques have found that perceived parental rejection relates not only directly to depression, but also directly to low self-esteem, which in turn relates to depression (Muris et al., 2001). Therefore, it seems that negative parental rearing behavior puts children at a "dual risk" for depression, by directly effecting depression scores, and by negatively influencing children's self-esteem.

Self-Esteem

As just mentioned, self-esteem, a cognitive characteristic, has been found to be related to depression in youth. The term "self-esteem", used in its purest form, is meant to refer to the way people feel about themselves, whereas terms such as "self-concept" are meant to refer to the way people think about themselves (Peterson & Nisenholz, 1999). However, philosophical distinctions such as these have become somewhat irrelevant, as these two terms, and several others, including "self-appraisal", "self-efficacy", "self-worth", and "self-value" are often used interchangeably by researchers. Thus, for the purposes of this discussion, the term self-esteem will be used to refer to a global view of one's own worth and capability.

Depressed early adolescents have significantly lower levels of self-esteem than those who are not depressed (DeRoss et al., 1999; Lau & Kwok, 2000; Marcotte et al.,

2002; Muris et al., 2001; Robertson & Simons, 1989). In particular, early adolescent girls experience a significant drop in their self-esteem, whereas early adolescent boys typically do not, leading some to suggest that self-esteem may be a causal factor in the development of gender differences in depression in early adolescence (Benjet & Hernandez-Guzman, 2002; Marcotte et al., 2002; McCauley Ohannessian, Lerner, Lerner, & von Eye, 1999).

Some reports indicate that self-esteem makes significant unique contributions to the prediction of depression in youth (Cole, Jacquez, & Maschman, 2001; Garber et al., 1997; Marcotte et al., 2002; Muris et al., 2001; Robertson & Simons, 2001; Siegel, 2002; Southall & Roberts, 2002). Furthermore, self-esteem has been shown to mediate or partially mediate the relationship between gender and depression (McCauley Ohannessian et al., 1999), between pubertal status (this variable is discussed in more detail below) and depression (Marcotte et al., 2002), between negative life events and depression (Herman-Stahl & Peterson, 1999), and as previously mentioned, between negative parental rearing behavior and depression (Garber et al., 1997; Muris et al., 2001; Robertson & Simons, 1989).

Negative Body-Image

When tested simultaneously with self-esteem, perceived physical attractiveness appears to explain a unique portion of the variance in early adolescent depression scores (Marcotte et al., 2002). In other words, there seems to be something special about one's body image that relates to depression in a way that a more global view of self-value does not.

Although both boys and girls who are depressed exhibit a more negative view of their own physical attractiveness (Marcotte et al., 2002; Siegel, 2002), change in body image has been offered as another explanation for the gender differences observed in depression at adolescence (Siegel, 2002). The pubertal changes females experience (such as increased body fat, decrease in shoulder width to hip width ratio) do not align with societal ideals (Siegel, 2002). The changes in the male form at puberty render the bodies of early adolescent boys more in accordance with cultural norms regarding masculine attractiveness (Benjet & Hernandez-Guzman, 2002).

Accordingly, adolescent females have been found to report a more negative body image than males in early adolescence (Adams, Katz, Beauchamp, Cohen, & Zavis, 1993; Benjet & Hernandez-Guzman, 2002; Cole et al., 2001; Franko & Striegel-Moore, 2002; Hankin & Abramson, 2001; McCauley Ohannessian et al., 1999). One longitudinal study found that the only symptom depressed girls demonstrated more frequently than depressed boys was negative body image (Kovacs et al., 2003). Body image has also functioned as a mediator in the relationship between gender and depression in early adolescence in several studies (Marcotte et al., 2002; McCauley Ohannessian et al., 1999; Seiffge-Krendel & Stemmler, 2002; Siegel, 2002). Thus, negative body image appears to be a risk factor largely attributable to females.

Pubertal Status

A dramatic increase in overall rates of depression, and the female preponderance in depression rates, becomes evident around the same time that pubertal development begins. The simultaneous occurrence of these events has led many to question whether they may be related (Ge, Conger, & Elder, 2001a; Laitinen-Krispijn et al., 1999). After

all, puberty is a time of many social, cognitive, and biological transitions, associated with emotional upheaval, and new social and behavioral expectations (Angold & Rutter, 1992; Ge et al., 2003; Hankin & Abramson, 2001).

As such, researchers have begun to investigate the utility of pubertal status in predicting depression scores, and in accounting for the gender difference in depression rates. Some have found that it is the timing of pubertal change that places children at risk for depression, with early pubertal onset resulting in depression in girls and late pubertal onset resulting in depression in boys (Franko & Striegel-Moore, 2002; Ge, et al., 2003). However, other results have indicated that it is more likely the onset of puberty, rather than the timing, that predicts depression (Hayward & Sanborn, 2002; Kessler et al., 2001; Piccinelli & Wilkinson, 2000). There is some empirical evidence to suggest that pubertal status is a significant predictor of depression scores (Ge et al., 2001a; Ge, Conger, & Elder, 2001b; Marcotte et al., 2002), whereas other results indicate that pubertal status does not predict depression (Angold & Rutter, 1992; Laitinen-Krispijn, et al., 1999; Sagrestano et al., 2003).

With regards to gender differences in the effects of pubertal status on depression, one study found that gender differences did exist, with 31% of pubertal girls, and only 7% of pubertal boys, reporting depressive symptoms (Benjet & Hernandez-Guzman, 2002). Additionally, Ge et al. (2001a) reported that pubertal status significantly mediated the relationship between gender and depression. On the other hand, results from a study by Marcotte et al. (2002) did not show pubertal status to be a mediator of the relationship between gender and depression. Thus, the relationship between gender, pubertal status and depression is still uncertain.

There is some evidence to suggest that puberty may exert its strongest influence on depression not directly, but rather through its negative effects on self-esteem and body image. Reaching puberty has been associated with a significantly lower body image and self-esteem (Franko & Striegel-Moore, 2002; Marcotte et al., 2002), particularly in girls (Benjet & Hernandez-Guzman, 2002). Furthermore, Marcotte et al. (2002) reported that self-esteem and body image are significant mediators of the relationship between pubertal status and depression in adolescents.

Socioeconomic Status

Socioeconomic status (SES) has been defined as the degree of access one has to a combination of valued societal resources, such as money, power, and status, typically derived from occupation, education, income, and prestige (McLoyd, 1998). Low SES negatively impacts upon parents' ability to meet their children's basic needs (for housing, food, clothing), increases the likelihood that family members will be exposed to higher levels of stress, and decreases the resources available for a child's cognitive and physical development (Graham & Easterbrooks, 2000).

Reports on the relationship between SES and depression in children and adolescents have been inconsistent (Merikangas & Avenevoli, 2002). Some researchers examining adolescents from differing levels of SES have not found significant differences in depression among these groups (Robertson & Simons, 1989; Waschbusch et al., 2003). SES was found by Liu (2003) to have no utility in predicting depression scores.

In contrast, other researchers have discovered significantly higher levels of depression in low SES adults (Conerly, Baker, Dye, Douglas, & Zabora, 2002), and

children (Frigerio, Pesenti, Molteni, & Battaglia, 2001; Graham & Easterbrooks, 2000) when compared to age-mates of higher socioeconomic means. Similarly, some researchers have indeed found that SES is a significant predictor of depression scores in children (Graham & Easterbrooks, 2000) and adolescents (Siegel, 2002). It has been suggested that SES is likely to have its most consistent impact on depression in children through parenting practices, which have been found to be more problematic among parents of lower socioeconomic status (Kim & Ge, 2000; Liu, 2003; McLoyd, 1998; Sheeber et al., 2001).

Conduct Problems

As discussed in an earlier section of this chapter, comorbidity is the norm, rather than the exception, in the area of childhood depression. During that discussion, it was stated that most studies have found comorbid disorders to precede depression in childhood. Given the high levels of comorbidity found in depressed children, and that these disorders usually appear prior to the development of depression, it seems reasonable to question whether there may be a causal relationship between disorders that precede depression, and the development of depression itself (Avenevoli et al., 2001).

As stated earlier, conduct disorder is a form of psychopathology frequently associated with depression. Little is known about potential gender differences in the interaction between depression and conduct problems (Marmorstein & Iacono, 2003). One review reported that conduct problems are more frequently comorbid in depressed boys than depressed girls (Kessler et al., 2001), whereas Kovacs et al. (2003) reported that depressed females are more likely to exhibit comorbid externalizing behavior relative to non-depressed females, non-depressed males, and depressed males.

Some have questioned whether conduct problems might be predictive of depression in youth (Roberts, 1999), though few have examined this question empirically (Avenevoli et al., 2001). Some studies have found that childhood depression is predictive of Antisocial Personality Disorder (a severe outcome of Conduct Disorder) in adulthood (Harrington, 2001; Loeber, Burke, & Lahey, 2002). However, studies examining the reverse, that is, the prediction of depression by conduct problems, are scarce. In one study, it was found that antisocial behavior in adolescence predicted a small amount of variance (7%) in concurrent depression (Compton, Snyder, Schrepferman, Bank, & Shortt, 2003).

Attention Regulation Problems

Also discussed in an earlier section of this chapter is the suggestion that depression is comorbid with disorders of attention regulation (Attention Deficit/Hyperactivity Disorder, or, AD/HD). There appears to be no studies that have investigated whether AD/HD symptoms (inattention, hyperactivity, impulsivity) predict depression in children or adolescents. Although some studies have found AD/HD and depression to be strongly correlated (Bird, Gould, & Staghezza, 1993), others have not found a significant relationship between the two (see Angold & Costello, 1993 for a review).

Summary: Remaining Questions and Issues

It is clear from the preceding discussion that many different variables have been found to create risk for depression in childhood and early adolescence. In particular, parental depression, negative life events/life stress, problematic peer relationships, negative parental rearing behavior, low self-esteem, negative body-image, pubertal status,

low SES, conduct problems, and attention regulation difficulties, are among the variables most consistently associated with depression across studies. However, what may be less evident from the previous review is that each group of researchers examining these risk factors has typically included only a small group (three to four) of these variables in their designs. Additionally, some researchers have not examined the impact of these variables by gender, eliminating the possibility of identifying gender-specific pathways to depression (Cicchetti & Toth, 1998; Connell & Goodman, 2002; Jacobson & Rowe, 1999).

As a result, the current body of knowledge is rather fragmented, with no empirical evidence to suggest how this group of variables might work together in the creation of risk for depression. There also exists a considerable amount of ambiguity regarding the impact of risk factors by gender. Given that it is impractical and unrealistic to design prevention efforts aimed at a large pool of risk factors, it seems that prevention programs would be best informed by the identification of those risk factors that most strongly predict depression, in both males and females. The inclusion of many different risk factors into one analysis is viewed by many working in this domain to be the next logical step in understanding depression etiology (see Bennett, Bendersky, & Lewis, 2002; Kessler et al., 2001; Muris et al., 2001; Sagrestano et al., 2003; and Sato, Uehara, Narita, Sakado, & Fujii, 2000).

Additionally, it is likely that interactions between risk factors also contribute to the development of depression, and thus the interrelationships between factors are important to examine (Hankin & Abramson, 1999; Ingram, 2001; Sagrestano et al., 2003). As the knowledge of risk factors grows, so does the need to move into an

examination of mediational and moderational models of risk (Garber & Flynn, 2001). Considering the information presented in the previous review of risk factors, there is some evidence to suggest that the effects of several predictors, including parental rearing behavior, pubertal status, and SES, on depression may be mediated by other factors in both males and females. However, when recent studies in this domain are examined as a group, the evidence for mediational models is either sparse, inconsistent, or fails to provide insight into possible gender differences.

Another remaining question in this research domain is the age range at which gender differences in depression emerge. Some of the studies described previously have demonstrated that gender differences in depression rates are seen in early adolescence, whereas other researchers have found that it is not until middle adolescence that the female preponderance begins.

Purpose and Focus of the Study

The current study is designed to address the issues outlined above. The purpose of the study is to identify, for a group of early adolescents, the most significant risk factors for depression among a larger group of common predictors, with a consideration of gender differences, and possible mediational models. The specific questions to be addressed are outlined below.

General Questions Addressed

Question 1: What risk factors are the best predictors of depression? The following variables will be tested for their unique contribution to depression scores: perceived quality of peer relationships, perceived parental rearing behavior (both parental nurturance and parental rejection), self-esteem, body image, pubertal status, SES, conduct

problems, and attention regulation problems. The rationale for the inclusion of these nine risk factors is provided by the preceding review; they are all common predictors of depression. However, the rationale behind the exclusion of parental depression and independent negative life events, two additional risk factors described in the previous review, is less obvious, and thus will be provided next.

Parental depression was not included in the current design because restrictions placed on the data source for this study, the National Longitudinal Survey of Children and Youth (NLSCY) (see Appendix A for a complete description of this survey) by its creators, Statistics Canada, made it difficult to access this variable. These missing data are a considerable drawback to this study. However, it must be noted that the predictive value of parental depression has already been well demonstrated. In fact, parental depression is now widely considered to be the strongest predictor of childhood depression (see previous discussion of this risk factor for details).

With regards to independent negative life events/stress (events over which the youth has no control or role in creating), no sources of independent stress were included in this study, as no measure of this variable was taken during data collection for the NLSCY. However, this is not considered to be a major weakness of this study, as studies examining the impact of independent versus dependent stress (stress that the youth has a role in creating) have found that dependent stress of an interpersonal nature has the strongest association with depression (Hammen, 2000; Hammen et al., 2003; Rudolph et al., 2000; Seiffe-Krenke & Stemmler, 2002). Thus, it was deemed most important to include variables that provided an index of dependent interpersonal stress. The following variables, included in the current study, were intended to represent salient forms of

dependent interpersonal life stress, specifically, negative interpersonal relationships and negative parental rearing behavior (both parental nurturance and parental rejection).

For Question 1, it is hypothesized that when all nine risk factors are examined as a group, interpersonal relationships, perceived parental rearing behavior (both parental nurturance and parental rejection), and self-esteem will significantly predict depression scores. These variables have had the most consistent and well-demonstrated associations with depression in children and adolescents across studies.

Question 2: Do the risk factors have differential importance for males and females? The results of various studies (described above), indicate that gender differences in the relationship between depression and various risk factors do exist. Thus, it seems important to examine whether the common risk factors included here have differential gender effects, especially given the female predominance in depression at adolescence. Although almost all risk variables discussed above have been reported to differ by gender in at least one study, the findings regarding gender differences in respect to risk factors have been largely inconsistent. Hence, it becomes difficult to ascertain what gender differences might be seen in the current study. There are a few variables, however, that have demonstrated a relatively clear pattern of gender differences. Specifically, several prior studies have found body image and negative interpersonal relations to be more strongly associated with depression in females than males (see the foregoing discussion for further details). Thus it is hypothesized that these variables will be included in the final model for females, but not for males.

Question 3: Do the gender differences known to exist in depression rates exist at early adolescence? The age at which gender differences in depression rates emerge is

currently unclear. Based on the findings of several studies described previously, it is hypothesized that there will be significant gender differences in the prevalence of depression in this sample of early adolescents.

Mediational Models Tested

Question 4: Does self-esteem partially mediate the relationship between parental rearing behavior and depression, in both males and females? Some studies (described previously) have found that self-esteem partially mediates the relationship between parental rearing behavior and depression. Thus, self-esteem will be investigated as a potential mediator in this regard. Because there is evidence to suggest that the effects of parental rearing behavior may differ by gender (outlined in an earlier section of this chapter), boys and girls will be investigated as separate groups. It is hypothesized that self-esteem will be a partial mediator of the relationship between parental rearing behavior and depression, for both genders.

Question 5: Is the relationship between pubertal status and depression mediated by self-esteem and body-image, in both males and females? Findings from a small group of studies described previously suggest that pubertal changes may be related to depression through the development of problematic self-esteem and body image. Thus, self-esteem and body image will be examined as potential mediators in this regard. In light of the mixed evidence regarding gender differences in the effects of pubertal status, self-esteem, and body image on depression, boys and girls will be investigated as separate groups. Based on findings from previous studies, it is hypothesized that both self-esteem and body image will mediate the relationship between pubertal status and depression, for both boys and girls.

Question 6: Does parental rearing behavior mediate the relationship between SES and depression, in both males and females? As noted previously, some have hypothesized that the effects of SES on depression are mediated by parental rearing behavior. However, empirical data to support this hypothesis is lacking. Given the previous general suggestion that risk factors may have differential gender effects, separate investigations will be conducted for boys and girls. It is hypothesized that parental rearing behavior will mediate the relationship between SES and depression in both males and females.

Chapter III: Methods

This chapter will outline the research design of this study, and describe the data source, participants, measures and data analysis procedures used to address the six research questions outlined in Chapter II. First, the research design will be presented. A short description of the data source will then be given (see Appendix A for further discussion), followed by a description of the sample studied. Next, a discussion of the measures used in this study will be presented. This chapter will conclude with a discussion of the data analysis procedures, including the delineation of the procedural orientation upon which the decision rules for the mediational models in this study are based.

Research Design

The design of this study was a correlational design, constructed to investigate relationships between gender, risk variables, and depression among 2014 early adolescents. A one-way ANOVA was used to investigate differences between 973 girls and 1041 boys in regards to depressive symptoms. A series of regression analyses (see the Data Analysis section of this chapter for further discussion) were used to investigate the mediational influences of several variables on the relationship between specific risk factors and depression.

Participants

A subsample of participants was selected from the National Longitudinal Survey of Children and Youth (NLSCY), Cycle 2 (Statistics Canada, 1999). A complete description of the NLSCY is given in Appendix A. The sample chosen for this study was restricted to only those individuals aged 12 or 13, for two reasons. Firstly, it is during this

developmental period that the overall prevalence in depression rates begins to rise (see Schwartz et al., 1998 and Seiffge-Krenke & Stemmler, 2002). Secondly, the female predominance in depression rates may also emerge at this time in development (Angold et al., 2002; Benjet & Hernandez-Guzman, 2002; Cole et al., 2002; Ge, et al., 1994; Holsen et al., 2000; Laitinen-Krispijn et al., 1999; Silberg et al., 1999).

The Canadian sample for the NLSCY was randomly selected and stratified, and consisted of 20,025 participants in total (see Appendix A for further discussion of the data collection procedures). The subsample of 12- and 13-year olds included in this study consisted of 2014 participants, 973 females and 1041 males. The demographic characteristics of the participants are presented in Table 1.

Table 1

Demographic Characteristics of the Sample

Demographic Variable	Number in Sample (n=2014)	Percentage of Sample
Gender of participant		
Female	973	48.3%
Male	1041	51.7%
Geographic Region of Residence		
Atlantic Provinces	479	23.9%
Quebec	383	19.1%
Ontario	509	25.4%
Prairie Provinces	479	23.9%
British Columbia	152	7.6%

SES of family²

Unemployed, high school uncompleted, income \$15,000 or less	158	7.9%
Unskilled labor force, high school uncompleted, income approx. \$25,000	133	6.6%
Semi-skilled labor force, high school completed, income approx. \$30,000	232	11.5%
Semi-skilled labor/clerical work high school completed, income approx. \$55,000	756	37.5%
Semi-professional, university degree obtained, income approx. \$65,000	464	23.0%
Professional, university degree obtained, income \geq \$80,000	271	13.4%
Family status		
Couples	1674	83.6%
Other	328	16.4%

² The creation of this variable is discussed in a later section of this chapter, see below for a description of how the SES variable was derived.

Measures

During data collection for the NLSCY, numerous questionnaires were individually administered to each participant, in an attempt to collect information on a wide range of areas, including biological, social, and emotional domains (see Appendix A for further details). The data included in the current study were obtained from a group of self-report scales.

The self-report measures used for this study are somewhat unique, in that most have been abbreviated from well-known and psychometrically sound instruments for use in the NLSCY, in order to meet the requirements of brevity necessary for such large scale data collection. However, as will be detailed below, there is some empirical evidence to suggest that these instruments function comparably well in abbreviated formats.

Depressive Symptoms

The items used to measure depressive symptoms were taken from the Centre for Epidemiological Studies – Depression Scale (CES-D), created by Radloff (1977) (Statistics Canada, 1999). The CES-D is one of the most widely used self-report measures of depression (Prescott et al., 1998; Skoridov & Vandervoort, 2003). It was designed to measure current levels of depressive symptoms, sampling symptoms of depressed mood, feelings of worthlessness/guilt, sense of helplessness/hopelessness, psychomotor retardation, loss of appetite, and sleep disturbance, with a focus on depressed mood (Radloff, 1977). The CES-D consists of 20 items (see Appendix B). This measure was initially designed for use with adults, but as will become evident in the following discussion, its utility with adolescents has also been demonstrated.

Reliability. The internal consistency (Cronbach's alpha) of the CES-D has been reported to range between .85 and .90 in both adult (Conerly et al., 2002; Dierker et al., 2001; Radloff, 1977; Skorikov & Vandervoort, 2003), and adolescent (Garrison et al., 1991; Radloff, 1991; Roberts, Andrews, Lewinsohn, & Hops, 1990; Roberts, Lewinsohn, & Seeley, 1991), ethnically diverse samples. Test-retest correlations have been reported to be only moderate (between .45 and .70) in both adult (Radloff, 1977) and adolescent samples (Roberts, et al., 1990; Roberts, et al., 1991). Moderate test-retest reliability was expected by Radloff (1977), given that the CES-D was designed to measure current levels of depressive symptoms, which would likely vary over time.

Validity. Radloff (1977) stated that the content validity of the CES-D was established based on the selection methods for the items on this scale. Specifically, the questions were chosen from a pool of items that comprised previously validated depression self-report scales, from a review of literature on the clinical symptoms of depression, and from factor analytic studies designed to discover the major components of depression.

Criterion-related validity was originally established through evidence of correlations (up to .75) with other depression rating scales, and by the ability of the CES-D to accurately discriminate between depression severity in patient groups, and between patient and community samples (Radloff, 1977). Other studies also have reported the concurrent validity of the CES-D to be adequate to high (Conerly et al., 2002; Roberts et al., 1991; Skorikov & Vandervoort, 2003), and its discriminant validity to be adequate (Dierker et al., 2001; Garrison et al., 1991).

Other studies have examined the sensitivity (i.e., the proportion of true positives identified) and specificity (i.e., the proportion of true negatives identified) (Mojarrad & Lennings, 2002) of this scale. Such studies have found the CES-D to be highly sensitive, but lower on specificity, when used with clinically depressed adolescent and adult samples (Dierker et al., 2001; Garisson et al., 1991; Mojarrad & Lennings, 2002; Prescott et al., 1998; Roberts et al., 1991; Somervell, Beals, Kinzie, Boehnlein, Leung, & Manson, 1993). In other words, the CES-D appears to identify a high number of false positives, classifying many people who do not meet the diagnostic criteria for depression as depressed.

Factor analysis has revealed that the CES-D consists of four factors, specifically, depressed affect, positive affect, somatic and retarded activity, and interpersonal in both adult (Radloff, 1977; Skorikov & Vandervoort, 2003) and adolescent samples (Roberts et al., 1990). In light of all her findings regarding reliability and validity, Radloff (1977) concluded that there was substantial evidence for the construct validity of the CES-D.

In summary, the CES-D is considered to be a reliable and valid measure of depressive symptoms in adolescents (Dierker et al., 2001; Dumenci & Windle, 1996; Garisson et al., 1991; Mojarrad & Lennings, 2002; Prescott et al., 1998; Radloff, 1991; Roberts et al., 1990; Roberts et al., 1991). Given the consistent finding that the CES-D yields a high proportion of false positives (see above), it is important to note that the true utility of this scale is limited to the identification of depressive symptoms, not MDD, and will be used for that purpose only in this study.

Format in the current study. In this study, the CES-D was shortened from the original 20 items to 12 items (see Appendix B) by researchers knowledgeable in this area

(Statistics Canada, 1999). There is some empirical evidence to support such an abbreviation, although the content of abridged versions varies across studies. For example, there is one shortened form consisting of 10 items, known as the CESD-10 (Andresen, Carter, Malmgren, & Patrick, 1994). This version has been found to be comparable to the reliability and validity of the original CES-D in adult populations (Andresen et al., 1994; Kohout, Berkman, Evans, & Cornoni-Huntley, 1993; Weng Boey, 1999). Some researchers have reported that in adolescent samples, only 13 items can be used to achieve comparable predictive validity (Prescott et al., 1998). Other researchers studying adolescents found that as few as four items from the CES-D can be administered while still maintaining a predictive efficacy equivalent to the 20-item version (Roberts et al., 1991).

After data collection for the NLSCY was completed, responses to the CES-D were factor analyzed, and a one-factor solution was imposed on the data. All 12 items loaded onto this factor at acceptable levels (Statistics Canada, 1999). Higher scores on this scale reflect higher levels of depression (Statistics Canada, 1999). For the subsample used in this study, the internal consistency (Cronbach's alpha) of this scale was found to be .95.

Self-Esteem

The items used to measure self-esteem were taken from the General Self scale of the Self-Description Questionnaire (SDQ), created by Marsh, Smith, and Barnes (1983a). As several scales from the SDQ were used in the current study, a description of the SDQ will first be given, followed by a discussion focused specifically on the General Self scale.

SDQ. The SDQ was designed to measure many different dimensions of self-perception, consisting of the following eight scales: Physical Ability, Physical Appearance, Relations with Peers, Relations with Parents, Reading Ability, Mathematic Ability, General Academic Ability, and General Self [-esteem] (Marsh et al., 1983a). There are several versions of the SDQ, designed for use with adolescents of various ages (Marsh, 1990).

It is important to note that there has been some concern expressed by researchers regarding the ceiling effect found for the SDQ. It has been reported that this measure does not discriminate well among children at the higher end of the score range, in other words, among children with varying degrees of high self-esteem (Flannery et al., 1995; Plucker, Taylor, Callahan, & Tomchin, 1997). However, because the SDQ had been found to function well in discriminating between those who are and are not low on its various scales (Flannery et al., 1995), this ceiling effect is not seen as an issue for the present study.

Reliability. The internal consistency (Cronbach's alpha) of the scales on the SDQ ranges from .73 to .94 (Marsh et al., 1983a; Marsh, Relich, & Smith, 1983b; Marsh, 1990; Plucker et al., 1997).

Validity. The content validity of the SDQ is said to be established based on the source of its items, which were chosen from a previously validated instrument, which was based on a theoretical framework (see Marsh et al., 1983a for a complete discussion). According to Marsh et al. (1983a), evidence of both convergent and divergent validity is provided by the pattern of correlations found between teacher ratings of adolescents' self-perceptions and adolescents' responses to the SDQ. Adequate correlations were found

between the two groups of raters across those domains which teachers could easily observe (e.g., academic ability), whereas low correlations were found between the two groups of raters across those domains that teachers could not easily observe (e.g., relations with parents) (Marsh et al., 1983a; Marsh et al., 1983b; Marsh, 1990). This pattern of correlations is expected based on the nature of the constructs measured, and adds to the validity evidence for this measure.

Factor analysis has revealed that there are eight factors within the SDQ, consistent with the eight dimensions of self-perception (see above) that this instrument was designed to measure (Abu-Hilal & Aal-Hussain, 1997; Marsh et al., 1983a; Marsh, 1990; Plucker et al., 1997; Watkins & Akande, 1992; Watkins & Mpofu, 1994). Given that all findings have indicated adequate reliability and validity, it has been stated that there is adequate evidence for the construct validity of the SDQ (Marsh et al., 1983a; Marsh et al., 1983b).

General Self scale. The General Self scale of the SDQ was designed to measure how effective and capable adolescents perceive themselves to be, their level of self-confidence and self-respect, and their level of pride in and satisfaction with themselves as individuals. The scale consists of 8 items (Marsh, 1990).

Reliability. The internal consistency of the General Self scale (using Cronbach's alpha) has been found to be between .82 and .93 across adolescent samples of various ages and ethnicities (Flannery, Reise, & Widaman, 1995; Hunter & Stringer, 1993; Marsh, 1990; Marsh et al., 1983b). However, it has been stated that the high internal consistency of this scale is partially achieved through the use of redundant questions; hence the same information could be gleaned from only two or three items (Flannery et

al., 1995). Test-retest reliability for this scale has been reported to be .87, over a four-week period (Hunter & Stringer, 1993).

Validity. The validity of the SDQ as a whole has been discussed previously. However, the construct validity of the General Self scale in particular is supported by results of factor analytic studies (across ethnically diverse samples), which indicate that the General Self scale loads onto all seven other factors, all of which measure much more specific aspects of self-perception (e.g., body image, academic competence, etc.). In other words, the General scale seems to be an underlying, general factor of the SDQ, its questions tapping into many facets of self-perception (Watkins & Akande, 1992; Watkins & Mpofu, 1994). This pattern of loadings is consistent with the global nature of the construct purported to be measured by the General Self scale, and provides additional evidence for its validity.

Format in the current study. In this study, the General Self scale was shortened to include 4 of the original 8 items (see Appendix C). The abbreviation of this scale is supported by the previously reported finding that the General Self scale contains redundant questions, and could be shortened to as few as two questions (see above). Higher scores reflect higher levels of self-esteem (Statistics Canada, 1999).

After data collection was completed by Statistics Canada, responses to the General Self scale were factor analyzed to test the existence of a unitary theoretical construct. Investigating data from two young adolescent subsamples (consisting of 1,371 and 1,413 participants, respectively), it was found that there was only one factor present on this scale (Statistics Canada, 1999), providing a small amount of evidence for the

validity of this shortened version. For the subsample studied here, the internal consistency (Cronbach's alpha) of this scale was found to be .88.

Body Image

The Physical Appearance scale of the SDQ (Marsh et al., 1983a) was used to measure body image in this study (Statistics Canada, 1999). The psychometric properties of the SDQ have already been described in detail above.

The Physical Appearance scale of the SDQ was designed to measure youths' perception of their own physical appeal, how their physical appearance compares with that of their peers, and the way in which their physical appearance is viewed by others (Marsh, 1990). The scale consists of 8 items (see Appendix D) (Marsh, et al., 1983b).

Reliability and validity. Internal consistency of the Physical Appearance scale (Cronbach's alpha) has been reported to be .90 or .91 across samples (Marsh, 1990; Marsh et al., 1983a). See the foregoing discussion for a general discussion regarding the validity of the scales from the SDQ.

Format in the current study. The Physical Appearance scale was utilized in an abbreviated format in the current study, reduced from the original 8 items to a total of 4 items (see Appendix D). Although there does not appear to be any studies that have investigated abridged versions of the Physical Appearance scale in particular, one study used shortened forms of various other scales from the SDQ (4 to 5 items from each), and reported that the utility of these scales was not significantly reduced (Marsh, 1994). Higher scores reflect a more positive body-image (Statistics Canada, 1999).

After the completion of data collection for the NLSCY, responses to the Physical Appearance scale were factor analyzed, to test the existence of a unitary theoretical

construct. Investigating two young adolescent samples (consisting of 1,371 and 1,413 participants, respectively), factor analysis revealed that there was only one factor present in this scale (Statistics Canada, 1999), substantiating to a small degree the validity of this abbreviated measure. For the subsample included in the current study, the internal consistency (Cronbach's alpha) of the Physical Appearance Scale was found to be .86.

Peer Relations

The Peer Relations scale of the SDQ (Marsh et al., 1983a) was used to evaluate how well each child felt he or she was getting along with his or her peers (Statistics Canada, 1999). The psychometric properties of the SDQ have been described in detail previously.

The Peer Relations scale of the SDQ was designed to measure adolescents' perceptions of how easily they make friends, how much others want them as friends, and their popularity (Marsh, 1990). The scale consists of 8 items (see Appendix E).

Reliability and validity. The internal consistency of the Peer Relations scale has been reported to range between .73 and .86 (Marsh, 1990; Marsh, Relich & Smith, 1983; Watkins & Akande, 1992). The validity of the SDQ scales has been detailed in an earlier section of this chapter.

Format in the current study. The Peer Relations scale was abbreviated for use in the NLSCY, from the original 8 items to 4 items (see Appendix E). The abbreviation of this scale is supported by a study that investigated the utility of a shortened version of this scale; results indicated that the psychometric properties remained strong (Marsh, 1994). Higher scores reflect higher quality peer relationships (Statistics Canada, 1999).

After data collection was completed, responses from two samples of young adolescents (consisting of 1,508 and 1,529 participants, respectively) to the Peer Relations scale were factor analyzed. Results indicated that only one factor existed within this scale (Statistics Canada, 1999), demonstrating in a small way the validity of this shortened scale. For the subsample included in this study, the internal consistency (Cronbach's alpha) was calculated at .95.

Parental Rearing Behavior

Two aspects of parental rearing behavior were examined in this study, specifically parental rejection and parental nurturance. The two scales used to measure these two constructs were both taken from a measure known as the Parenting Questionnaire, originally created by Lempers, Clark-Lempers, & Simons in 1989 (Statistics Canada, 1999). The Parenting Questionnaire is a 29-item questionnaire, designed to measure adolescents' perceptions of their parents' behavior toward them using the following three scales: Parental Nurturance, Parental Monitoring, and Parental Inconsistency/Rejection-Orientated Behavior (see Appendix F) (Lempers et al., 1989).

Reliability. The reliability (Cronbach's alpha) of the Parenting Questionnaire has been found to be .80 (Lempers et al., 1989).

Validity. Lempers et al. (1989) stated that the content validity of the Parenting Questionnaire was demonstrated by the source of many of the items on this measure, as most were taken from several previously validated parenting scales. Furthermore, factor analysis revealed that the three hypothesized factors (Nurturance, Monitoring, and Inconsistency/Rejection-Orientated Behavior) did exist within this scale. Lempers et al. (1989) collected no other validity data on this measure, and there appears to have been no

further analysis completed on this instrument since its creation. However, with regards to construct validity, Lempers et al. (1989) stated that because there was strong evidence for the construct validity of the measures upon which the Parenting Questionnaire had been based, one could be confident about the construct validity of the Parenting Questionnaire as well.

Format in the current study. Only the Parental Nurturance and Parental Rejection-Orientated Behavior scales from the Parenting Questionnaire were used in the current study. The Parental Nurturance scale was shortened from 14 items to 6 items, whereas the Parental Rejection-Oriented Behavior scale was shortened from 10 items to 7 items (see Appendix F). Lower scores on each scale indicate a low degree of the parenting characteristic measured, be it parental nurturance or parental rejection (Statistics Canada, 1999).

Once data collection for the NLSCY was completed, responses to both the Parental Nurturance scale and the Parental Rejection scale were factor analyzed, using the responses of 2,154 young adolescents. Two factors were identified, namely, the parental nurturance factor and the parental rejection factor (Statistics Canada, 1999). This two-factor solution is consistent with the factor structure of the original Parenting Questionnaire, and provides a small amount of evidence for the validity of these shortened scales. For the subsample included in this study, the internal consistency (Cronbach's alpha) of both the Parental Nurturance and Parental Rejection scales was .90.

Socioeconomic Status

The SES of each participant was derived by Statistics Canada from five sources: the level of education attained by the primary caregiver of each child (labeled the “person most knowledgeable”, or PMK), the level of education attained by the spouse or partner, the prestige of the PMK’s occupation, the prestige of the spouse’s or partner’s occupation, and household income. The final value used to represent each household’s SES was created by first standardizing each variable, and then obtaining a mean value (Statistics Canada, 1999).

Conduct Problems

The presence of conduct problems was assessed using a 6-item self-report questionnaire (see Appendix G) compiled by researchers knowledgeable in the area. The questions for this scale were taken from previous large-scale Canadian surveys similar to the NLSCY. Higher scores are said to reflect a higher level of conduct problems (Statistics Canada, 1999).

After data collection for the NLSCY was completed, factor analysis was conducted on responses to the Conduct Problems scale, using data from two subsamples of early adolescents (consisting of 1,705 and 1,729 participants, respectively). From a pool of 12 items intended to measure conduct problems, 6 items were retained, comprising a factor named “Conduct Disorder and Physical Aggression” (Statistics Canada, 1999). Thus, some of the questions from this scale pertain particularly to physical aggression (see Appendix G). The internal consistency of this scale for the subsample investigated in the study was found to be .91.

Attention Regulation Problems

The presence of inattention and hyperactivity was assessed using an 8-item self-report questionnaire (see Appendix H), compiled by researchers knowledgeable in the area. The questions for this scale were also taken from previous large-scale Canadian surveys. Higher scores are said to reflect higher levels of attention regulation difficulties (Statistics Canada, 1999).

Upon completion of data collection, responses to this scale were factor analyzed using data from two subsamples of early adolescents (consisting of 1,705 and 1,729 participants, respectively). From a pool of 10 items intended to measure attention regulation difficulties, 8 items were retained to form a factor named “Hyperactivity/Inattention” (Statistics Canada, 1999). The internal consistency of this scale was calculated for the subsample used in the current study, and was found to be .87.

Pubertal Status

The pubertal status score used in this study was derived from the NLSCY data³, based on the design of the Pubertal Development Scale (PDS) (Petersen, Crockett, Richards & Boxer, 1988). The PDS was designed as a self-report questionnaire, intended to measure pubertal development. For boys, five domains of pubertal development are investigated, specifically, evidence of body hair, voice change, skin change, growth spurt, and facial hair. For girls, evidence of development in the following five domains is investigated: body hair, breast change, skin change, growth spurt, and menarche (Petersen et al., 1988).

³ This score was compiled by Dr. Tak Fung at the University of Calgary, at the request of the author.

The internal consistency of the PDS has been found to range between .68 and .83 (Ge et al., 2001a; Ge et al., 2001b; Petersen et al., 1988). Criterion validity has been established based on high correlations (median of .70) between observers' ratings of pubertal status and adolescent responses to the PDS, and on the ability of the PDS to predict height changes in adolescents. This pattern of relationships is consistent with expectations based on the construct being measured (Petersen et al., 1988).

Based on the design of the PDS, the following three variables from the NLSCY were used to derive a pubertal status variable for females: body hair growth, breast development, and menstruation (see Appendix I). For males, the following three variables were used: voice change, facial hair growth, and body hair growth (see Appendix I). On each of the three variables, participants were assigned a value of 1 to indicate that they had experienced signs of pubertal development for that variable, or a value of 0 to indicate they had not experienced signs of pubertal development for that variable.

The scores from each of the three variables were then summed for each gender, with the highest possible score being 3, indicating that participants had signs of pubertal development across all three variables, and the lowest possible score being 0, indicating that participants had experienced no signs of pubertal development across any of the three variables. Participants with total scores between 1 and 3 were considered pubertal, as they had experienced one or more signs of pubertal development at the time of data collection. Participants with total scores of 0 were considered pre-pubertal, as they had experienced no sign of pubertal development at the time of sampling.

Procedure: Data Analysis

In order to investigate Question 1 (what risk factors are the best predictors of

depression?), stepwise regression analysis was conducted using the entire sample⁴. The following variables were entered as predictors: peer relations, body image, self-esteem, pubertal status, SES, perceived parental nurturance, perceived parental rejection, conduct problems, and hyperactivity/inattention. Depression score was the dependent variable.

For Question 2 (do the risk factors have differential importance for males and females?), stepwise regression analysis was conducted separately on the subsample of females, and the subsample of males⁴. The same nine variables were included as predictors; depression was the dependent variable.

To investigate Question 3 (do the gender differences known to exist in depression rates exist at early adolescence?), a one-way ANOVA was conducted on the depression scores of boys and girls. Depression score was included as the dependent variable, and gender as the independent variable, to determine if there were significant differences in depressive symptoms between the genders at early adolescence.

Question 4 (does self-esteem partially mediate the relationship between parental rearing behavior and depression, in both males and females?), Question 5 (is the relationship between pubertal status and depression mediated by self-esteem and body-image, in both males and females?), and Question 6 (does parental rearing behavior mediate the relationship between SES and depression, in both males and females?) examined potential mediating effects of specific variables. These three questions were addressed using a series of regression analyses and decision rules, as suggested by Baron and Kenny (1986). In this regard, a variable was considered to have mediational effects

⁴ Missing values were excluded pairwise. Pairwise deletion includes in each computation all non-missing values for each case, thereby maximizing the amount of data used in each analysis. Pairwise deletion stands in contrast to listwise deletion (the default), which excludes from each computation completely those cases with missing values on any one variable under investigation. (SPSS 12.0).

on a risk variable in relationship to depression if the following conditions, suggested by Baron and Kenny (1986), were satisfied:

1. The risk variable was found to significantly predict depression in a linear regression analysis.
2. The mediator was found to significantly predict depression in a linear regression analysis.
3. The risk variable was found to significantly predict the mediator in a linear regression analysis.
4. When the mediator and the risk variable were entered into a linear regression analyses together as predictors of the dependent variable, the relationship of the risk variable to depression was found to be less than it was at the beginning (see number 1).

If the relationship between the risk variable and depression is no longer significant when the last regression analysis is conducted, mediation has been demonstrated. If the afore stated relationship is reduced, but remains significant, during the final regression analysis, partial mediation has been demonstrated. In other words, it can be assumed that other mediators are also operating to explain this relationship.

Chapter IV: Results

In this chapter, the results of all statistical analyses described in Chapter III will be presented. The first section of this chapter will provide descriptive statistics conducted on the variables included in this study. Then, statistical results pertaining to each of the six research questions defined in Chapter II will be discussed in turn.

Descriptive Statistics

The mean scores, modes, and minimum and maximum values for each of the nine predictors (peer relations, parental nurturance, parental rejection, self-esteem, body image, pubertal status, SES, conduct problems, and hyperactivity/inattention), and for the dependent variable (depression score), are presented in Table 2. As can be seen from the mean scores, the majority of the sample provided responses that would indicate high levels of positive perceptions/emotions, and low levels of negative perceptions/emotions.

Also evident from an examination of mean scores is that the majority of the sample is pubertal (see Table 2). In fact, only 81 participants indicated that they had experienced no sign of pubertal development, whereas 1021 participants indicated that pubertal development appeared complete. Further investigation of this variable using one-way ANOVA revealed that females were significantly further along in their pubertal development than males, $F(1) = 93.48, p \leq .001$.

Table 2

Descriptive Statistics

Variable	Mean	SD	Mode	Minimum	Maximum
Peer Relations ^a	13.04	2.74	16	0	16
Parental Nurturance ^a	18.36	4.41	24	0	24
Parental Rejection ^a	9.19	4.64	9	0	24
Self-Esteem ^a	13.02	2.65	15	0	16
Body Image ^a	10.74	3.84	12	0	16
Pubertal Status ^b	2.33	.83	3	0	3
SES ^c	4.02	1.36	4	1	6
Conduct Problems ^a	1.26	1.88	0	0	12
Hyperactivity/Inattention ^a	4.11	3.02	2	0	16
Depression Score ^a	6.34	5.17	3	0	36

^a Higher scores reflect higher levels of the variable being studied

^b Scores from 1 to 3 indicate that the participant has begun to experience puberty, a score of 0 indicates pubertal development has not yet begun. A score of 3 indicates that pubertal development is well underway.

^c A mode of 4 would indicate that an income of \$55,000 was the most frequent response

*General Questions Addressed**Question 1: What Risk Factors are the Best Predictors of Depression?*

A stepwise regression analysis was conducted using the nine risk variables (peer relations, body image, self-esteem, pubertal status, SES, parental nurturance, parental rejection, conduct problems, and hyperactivity/inattention) as predictors, and depression score as the dependent variable. Missing values were excluded pairwise.

Stepwise multiple regression analysis functions so that the first predictor to enter the equation is the one that demonstrates the largest correlation with the dependent variable (in this case, depression score). This procedure repeats with the remaining predictors, entering at each step the predictor demonstrating the largest correlation with depression. The procedure terminates when the inclusion of additional predictors does not result in a significant improvement in the amount of unique variance in the depression score accounted for by the equation (Stevens, 2002).

Before the results for the stepwise regression can be discussed, the assumptions upon which this statistical procedure is based must be assessed in the context of the current data, to determine if any of these assumptions have been violated. The assumptions underlying regression analysis are as follows: the relationship between variables is linear (assumption of linearity), the residual scores⁵ are normally distributed (assumption of normality) and demonstrate constant variance (assumption of constant variance), and the observations are independent (assumption of independence of observations) (StatSoft, 2004; Stevens, 2002).

Although regression analysis is quite robust against violations of these assumptions, it is always prudent to be aware of such violations when considering results of a regression analysis (StatSoft, 2004). Most assumptions underlying multiple linear regression cannot be overtly tested, but major violations can be detected using graphical representations of the data (StatSoft, 2004). Thus, the results of the stepwise regression analysis were used to investigate each assumption for potential violations.

⁵ Values expressing the deviation of each observation from the regression line, obtained by subtracting observed values from predicted values (StatSoft, 2004).

Assumption of normality. In order to investigate the assumption of normality for these data, the standardized residual scores (obtained from the regression analysis) were graphically displayed using a histogram, as recommended by Stevens (2002) and StatSoft (2004), and the normality of the resulting distribution was examined. The distribution that resulted was normal (see Figure 1), hence the assumption of normality has not been violated in the current data set.

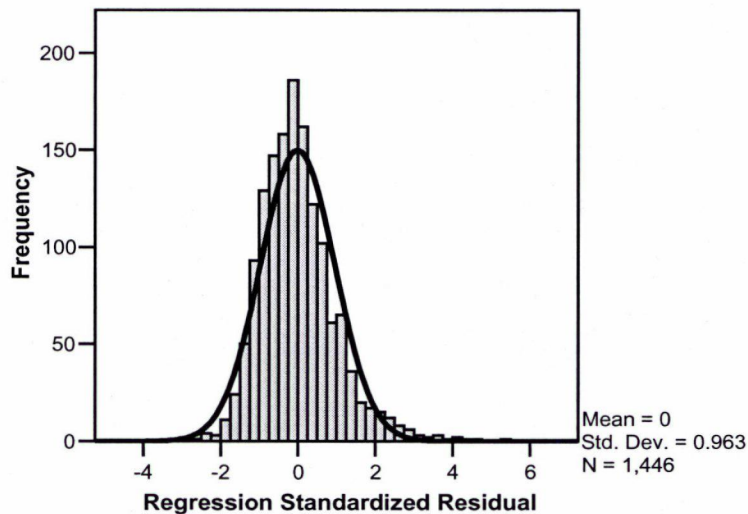


Figure 1. Graphical representation of the standardized residual scores resulting from the regression analysis. This histogram depicts the normal distribution of the residual scores.

Assumption of linearity and assumption of constant variance. Next, the assumption of linearity and the assumption of constant variance were investigated simultaneously for these data. As recommended by Stevens (2002) and StatSoft (2004), a residual plot was generated based on the results of the regression analysis, which plotted the standardized residual values against the standardized predicted values. When the

assumption of linearity and the assumption of constant variance have not been violated, a residual plot will depict the standardized residual values as randomly scattered around the horizontal line (see Figure 2) which represents a standardized residual value of 0, or a perfect prediction. Systematic clustering of the residual values around this line reveals a violation of the assumption of constant variance (a cone-shaped pattern), a violation of the assumption of linearity (a curve in the pattern), or both (a cone-shaped curved pattern) (Stevens, 2002).

As can be seen in Figure 2, the residual values demonstrate a clear pattern of clustering (a cone-shaped pattern). This pattern of clustering is indicative of a violation of the assumption of constant variance (Stevens, 2002), as the variability surrounding lower predicted depression scores is much less than the variability surrounding depression scores at the higher end of the spectrum. Thus, this regression model predicted depression scores at the lower end of the spectrum much better than depression scores at the higher end of the spectrum. Conversely, the absence of a curvilinear pattern in the data (see Figure 2) indicates that the assumption of linearity remains unviolated in this data set.

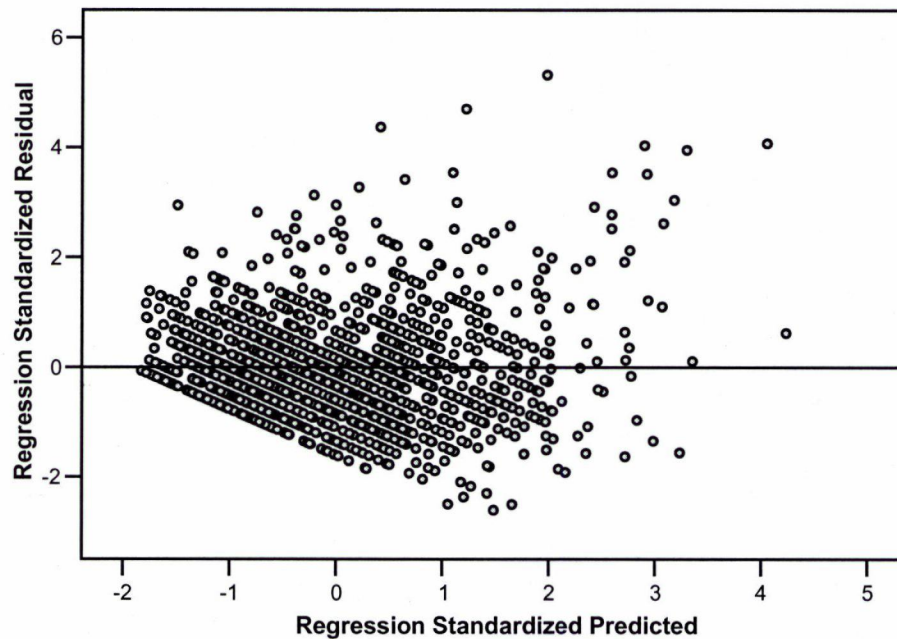


Figure 2. Graphical representation of the standardized residual values plotted against the standardized predicted values that resulted from the regression analysis. This scatterplot indicates that the assumption of constant variances has been violated, but that linearity can be assumed.

Assumption of independence of observations. The final assumption of multiple regression analysis is that each observation is independent of all other observations in the data set. Participants for the NLSCY sample were selected randomly by Statistics Canada, and data collection was conducted on a private, interviewer-to-participant basis (as described in Appendix A). As such, there is no reason to suggest that the responses of one participant would be dependent upon the responses of another. Thus, it was concluded that this assumption had not been violated.

Statistical findings for Question 1. The results of the stepwise multiple regression analysis are presented below. In order to investigate the potential for outliers that might significantly alter the results of the regression analysis, Cook's Distance⁶ was calculated for the data included, and was found to range between .000 and .062. Given that an outlier will likely not have a significant influence on the results of the regression unless Cook's Distance exceeds 1.0 (Stevens, 2002), it was concluded that there were no influential data points that needed to be removed from this data. The intercorrelations between the nine predictor variables are summarized in Table 3. Most of the correlations between predictors are low, with the exception of several in the moderate range. Thus concern about multicollinearity⁷ appeared minimal.

Results from the stepwise regression analysis on the entire sample are presented in Table 4. The final regression model included six of the nine predictors, and accounted for 42% of the total variance in depression score, $R^2 = .418, p < .001$. The first variable to enter the equation was self-esteem, accounting for 31% of the total variance in depression score (Step 1: $R^2 = .312, p < .001$). The second variable to enter was hyperactivity/inattention, accounting for an additional 5% of unique variance in depression score (Step 2: $R^2 = .364, p < .001$). Parental nurturance entered at the third step, accounting for another 3% of unique variance (Step 3: $R^2 = .396, p < .001$).

⁶ A method of identifying influential data points in a regression analysis, providing a measure of the change in regression coefficients that would occur if the case was omitted from the data set (Stevens, 2002).

⁷ Moderate to high correlations between variables (Stevens, 2002)

Table 4

Results of the Stepwise Regression Analysis using Nine Predictors – Entire Sample

Independent Variable Entered ^a	R^2	R^2 Change	p
1. Self-Esteem	.312	.312	.001
2. Hyperactivity/Inattention	.364	.053	.001
3. Parental Nurturance	.396	.032	.001
4. Parental Rejection	.412	.016	.001
5. Conduct Problems	.416	.004	.001
6. Peer Relations	.418	.002	.001

^aDependent variable = Depression score

Parental rejection entered at the fourth step, and accounted for 2% of variance (Step 4: $R^2 = .412$, $p < .001$), whereas conduct problems, entering at the fifth step, accounted for less than 1% of variance (Step 5: $R^2 = .416$, $p < .001$). At the sixth and last step, peer relations entered, to account for less than 1% of unique variance in depression score (Step 6: $R^2 = .418$, $p < .001$).

In summary, the six predictors that accounted for a total of 42% of the variance in depression score, presented in order of entry from first to last, were: self-esteem, hyperactivity/inattention, parental nurturance, parental rejection, conduct problems, and peer relations. Body image, pubertal status, and SES were excluded from the equation.

Question 2: Do the Risk Factors have Differential Importance for Males and Females?

Stepwise regression analysis was conducted separately on the subsample of females, and on the subsample of males. Missing values were excluded pairwise. The tests of assumptions for the regression analyses on both male and female subsamples

were found to be virtually identical to the tests of assumptions for the entire sample, and thus will not be discussed again. The same nine predictors were entered as independent variables, and depression score remained the dependent variable.

Statistical findings for Question 2: Females only. The intercorrelations between the nine predictor variables for the female subsample are summarized in Table 5. The correlations between predictors were low, with a few in the moderate range. Again, these values present little need for concern regarding multicollinearity of predictors.

Results from the stepwise regression analysis on the female subsample are presented in Table 6. The final regression model included five of the nine predictors, and accounted for 49% of the total variance in depression score, $R^2 = .486, p < .001$. The first variable to enter the equation was self-esteem, accounting for 35% of the total variance in depression score (Step 1: $R^2 = .349, p < .001$). The second variable to enter was hyperactivity/inattention, accounting for an additional 7% of unique variance (Step 2: $R^2 = .423, p < .001$). Parental nurturance entered at the third step, accounting for 4% of variance (Step 3: $R^2 = .461, p < .001$), and parental rejection entered at the fourth step, accounting for an additional 2% of variance (Step 4: $R^2 = .476, p < .001$). At the fifth and final step, conduct problems entered, and accounted for 1% of the remaining unique variance (Step 5: $R^2 = .486, p < .001$).

In summary, the five predictors that accounted for a total of 49% of the variance in the depression scores of females, presented in order of entry from first to last, were: self-esteem, hyperactivity/inattention, parental nurturance, parental rejection, and conduct problems. Body image, pubertal status, SES, and peer relations were excluded from the equation.

Table 6

Results of the Stepwise Regression Analysis using Nine Predictors – Females Only

Independent Variable Entered ^a	R^2	R^2 Change	p
1. Self-Esteem	.349	.349	.001
2. Hyperactivity/Inattention	.423	.074	.001
3. Parental Nurturance	.461	.038	.001
4. Parental Rejection	.476	.015	.001
5. Conduct Problems	.486	.011	.001

^aDependent variable = Depression score

Statistical findings for Question 2: Males only. The intercorrelations between the nine predictor variables for the male subsample are summarized in Table 7. Most of the correlations between predictors were low, although a few fell in the moderate range.

Thus, a problematic level of multicollinearity of predictors was not indicated.

Results from the stepwise regression analysis on the male subsample are presented in Table 8. The final regression model included six of the nine predictors, and accounted for 36% of the total variance in depression score, $R^2 = .358$, $p < .001$. The first variable to enter the equation was self-esteem, accounting for 26% of the total variance in depression score (Step 1: $R^2 = .256$, $p < .001$). The second variable to enter was parental rejection, accounting for an additional 4% of unique variance (Step 2: $R^2 = .299$, $p < .001$). Parental nurturance entered at the third step, accounting for 2% of variance (Step 3: $R^2 = .324$, $p < .001$), and hyperactivity/inattention entered at the fourth step, accounting for an additional 2% of variance (Step 4: $R^2 = .339$, $p < .001$).

Table 8

Results of the Stepwise Regression Analysis using Nine Predictors – Males Only

Independent Variable Entered ^a	R^2	R^2 Change	p
1. Self-Esteem	.256	.256	.001
2. Parental Rejection	.299	.043	.001
3. Parental Nurturance	.324	.025	.001
4. Hyperactivity/Inattention	.339	.015	.001
5. Peer Relations	.352	.013	.001
6. Conduct Problems	.358	.006	.001

^aDependent variable = Depression score

At the fifth step, peer relations entered, and accounted for 1% of variance (Step 5: $R^2 = .352$, $p < .001$). Conduct problems entered at the sixth and final step, and accounted for less than 1% of the remaining unique variance (Step 6: $R^2 = .358$, $p < .001$).

In summary, the six predictors that accounted for a total of 36% of the variance in the depression scores of males, presented in order of entry from first to last, were: self-esteem, parental rejection, parental nurturance, hyperactivity/inattention, peer relations, and conduct problems. Body image, pubertal status, and SES were excluded from the equation.

Summary of Question 2 results. The common risk factors for depression in males and females differed slightly, with peer relations entering into the final predictive model for males, but not for females. Furthermore, the order of entry of the predictors differed for males and females. Lastly, the amount of variance explained by the regression model differed for males and females. For males, the predictors included in the final model accounted for 36% of the total variance in their depression scores. In contrast, the

predictors included in the final model for females accounted for 49% of the total variance in their depression scores.

Question 3: Do the Gender Differences Known to Exist in Depression Rates Exist at Early Adolescence?

A one-way ANOVA was conducted on the depression scores of boys and girls, with depression score as the dependent variable, and gender as the independent variable. The results of this analysis are presented in Table 9. The ANOVA results revealed that there was a significant difference between the mean depression scores of early adolescent females and males, $F(1) = 8.77, p \leq .003$, with females demonstrating more depressive symptoms than males.

Table 9

One-Way ANOVA for the Gender Differences in Depression Scores

	Means (SD)		$F(df)$	p
	Females	Males		
Depression Score	6.71 (5.63)	5.97 (4.62)	8.77 (1)	.003

Mediational Models Tested

In accordance with the procedures suggested by Baron and Kenny (1986) (see Chapter III for a complete description), a series of regression analyses⁸ were conducted to test the mediational models hypothesized to exist in Questions 4, 5, and 6. If these analyses bore out the following relationships, the given mediational model could be accepted:

⁸ Missing values were excluded pairwise for all regression analyses.

- Step 1: The risk variable should predict the dependent variable (depression score).
- Step 2: The mediator should predict the dependent variable (depression score).
- Step 3: The risk variable should predict the mediator.
- Step 4: When the mediator and the risk variable are entered into the regression equation together as predictors of the dependent variable, the relationship of the risk variable to depression should be less than it was in step 1 (see above).

Question 4: Does Self-Esteem Partially Mediate the Relationship Between Parental Rearing Behavior and Depression, in Both Males and Females?

Both parental nurturance and parental rejection were used as indices of parental rearing behavior. Thus, parental nurturance and parental rejection were examined in separate analyses, for both male and female subsamples. See below for the results.

Female subsample: Parental nurturance. Table 10 summarizes the results of the regression analyses conducted to test self-esteem as a partial mediator of the relationship between parental nurturance and depression in females. As can be seen in Table 10, in accordance with step 1 of the series of analyses described above, parental nurturance was found to be a significant predictor of depression score, $R^2 = .244, p < .001$. In accordance with step 2, self-esteem was a significant predictor of depression, $R^2 = .349, p < .001$. In accordance with step 3, parental nurturance significantly predicted self-esteem, $R^2 = .227, p < .001$. In accordance with step 4, when parental nurturance and self-esteem were entered together as predictors of depression, it was found that the impact of parental nurturance on depression was less than it was at step 1. However, the impact parental

nurturance on depression remained significant when the effects of self-esteem were considered (see Table 10). Thus, self-esteem only partially mediates this relationship.

Table 10

Self-esteem as a Partial Mediator of Parental Nurturance in Females

Step of Analysis	Variable	Standardized	<i>t</i> -ratio	<i>p</i>
Series	Entered	Coefficient β		
Step 1	Parental nurturance ^a	-.49	-16.28	<.001
Step 2	Self-esteem ^a	-.59	-21.17	<.001
Step 3	Parental nurturance ^b	.48	16.29	<.001
Step 4	Self-esteem ^a	-.46	-15.04	<.001
	Parental Nurturance ^a	-.27	-8.98	<.001

^a Dependent variable = depression score

^b Dependent variable = self-esteem

Female subsample: Parental rejection. Table 11 summarizes the results of the regression analyses conducted to test self-esteem as a partial mediator of the relationship between parental rejection and depression in females. As can be seen in Table 11, in accordance with step 1 of the analyses described above, parental rejection was a significant predictor of depression, $R^2 = .180, p < .001$. In accordance with step 2, self-esteem was a significant predictor of depression, $R^2 = .349, p < .001$. In accordance with step 3, parental rejection significantly predicted self-esteem, $R^2 = .112, p < .001$. In accordance with step 4, when parental rejection and self-esteem were entered together as predictors of depression, the impact of parental rejection on depression was lessened relative to its impact at step 1 (see Table 11). However, the impact parental rejection on

depression remained significant when the effects of self-esteem were considered. Thus, self-esteem only partially mediates this relationship.

Table 11

Self-esteem as a Partial Mediator of Parental Rejection in Females

Step of Analysis	Variable	Standardized	<i>t</i> -ratio	<i>p</i>
Series	Entered	Coefficient β		
Step 1	Parental rejection ^a	.43	13.45	<.001
Step 2	Self-esteem ^a	-.59	-21.17	<.001
Step 3	Parental rejection ^b	-.33	-10.61	<.001
Step 4	Self-esteem ^a	-.51	-17.70	<.001
	Parental rejection ^a	.26	8.98	<.001

^a Dependent variable = depression score

^b Dependent variable = self-esteem

Male subsample: Parental nurturance. Table 12 summarizes the results of analyses conducted to test self-esteem as a partial mediator of the relationship between parental nurturance and depression in males. As can be seen in Table 12, in accordance with step 1 of the series of analyses described above, parental nurturance significantly predicted depression, $R^2 = .129$, $p < .001$. In keeping with step 2, self-esteem significantly predicted depression, $R^2 = .256$, $p < .001$. In accordance with step 3, parental nurturance significantly predicted self-esteem, $R^2 = .132$, $p < .001$. In accordance with step 4, when parental nurturance and self-esteem were entered together as predictors of depression, the impact of parental nurturance was less than it was at step 1 (see Table 12). However,

the impact parental nurturance on depression remained significant when the effects of self-esteem were considered, so self-esteem only partially mediates this relationship.

Table 12

Self-esteem as a Partial Mediator of Parental Nurturance in Males

Step of Analysis	Variable	Standardized	<i>t</i> -ratio	<i>p</i>
Series	Entered	Coefficient β		
Step 1	Parental nurturance ^a	-.36	-10.88	<.001
Step 2	Self-esteem ^a	-.51	-16.82	<.001
Step 3	Parental nurturance ^b	.36	11.91	<.001
Step 4	Self-esteem ^a	-.43	-13.67	<.001
	Parental nurturance ^a	-.20	-6.27	<.001

^a Dependent variable = depression score

^b Dependent variable = self-esteem

Male subsample: Parental rejection. Table 13 summarizes the results of the regression analyses conducted to test self-esteem as a partial mediator of the relationship between parental rejection and depression in males. As can be seen in Table 13, in accordance with step 1 of the analyses described above, parental rejection significantly predicted depression, $R^2 = .110$, $p < .001$. In accordance with step 2, self-esteem was a significant predictor of depression, $R^2 = .256$, $p < .001$. In accordance with step 3, parental rejection significantly predicted self-esteem, $R^2 = .069$, $p < .001$. In keeping with step 4, when parental rejection and self-esteem were entered together as predictors of depression, the impact of parental rejection on depression was less, relative to its impact at step 1 (see Table 13). However, the impact parental rejection on depression remained significant

when the effects of self-esteem were considered. Thus, self-esteem only partially mediates this relationship.

Table 13

Self-esteem as a Partial Mediator of Parental Rejection in Males

Step of Analysis	Variable	Standardized	<i>t</i> -ratio	<i>p</i>
Series	Entered	Coefficient β		
Step 1	Parental rejection ^a	.33	10.00	<.001
Step 2	Self-esteem ^a	-.51	-16.82	<.001
Step 3	Parental rejection ^b	-.26	-8.21	<.001
Step 4	Self-esteem ^a	-.45	-14.71	<.001
	Parental rejection ^a	.21	7.01	<.001

^a Dependent variable = depression score

^b Dependent variable = self-esteem

Summary of Question 4 results. For both males and females in this sample, self-esteem was found to be a partial mediator of the effects of parental nurturance on depression. In addition, self-esteem was a partial mediator of the effects of parental rejection of depression, for both males and females.

Question 5: Is the Relationship Between Pubertal Status and Depression Mediated by Self-Esteem and Body-Image, in Both Males and Females?

Male and female subsamples were again examined separately in the analyses for Question 5. The same four statistical steps outlined in previously were used to investigate Question 5. The results for each gender are discussed below.

Female subsample. At step 1 of the analysis series, pubertal status did not significantly predict depression in females, $R^2 = .002$, $p < .16$. Hence, all subsequent analyses were dropped, as pubertal status was not a significant risk factor for depression in these females.

Male subsample. As was the case for the female subsample, pubertal status was not a significant predictor of depression score in the male subsample, $R^2 = .000$, $p < .91$. Because pubertal status was not a significant risk factor for depression in this group of males, all further analyses were dropped.

Question 6: Does Parental Rearing Behavior Mediate the Relationship Between SES and Depression, in Both Males and Females?

Both parental nurturance and parental rejection were used as indices of parental rearing behavior. Thus, as in Question 4, parental nurturance and parental rejection were examined in separate analyses, for both male and female subsamples. The results are presented by gender below.

Female Subsample: Parental nurturance. Table 14 summarizes the results of the regression analyses conducted to test parental nurturance as a mediator of the relationship between SES and depression. As can be seen in Table 14, in keeping with step 1, SES significantly predicted depression, $R^2 = .009$, $p < .007$. In accordance with step 2, parental nurturance significantly predicted depression, $R^2 = .244$, $p < .001$. In keeping with step 3, SES was a significant predictor of parental nurturance, $R^2 = .011$, $p < .001$. In accordance with step 4, when SES and parental nurturance were entered together as predictors of depression, the impact of SES on depression was rendered insignificant (see Table 14).

Thus, parental nurturance can be said to mediate the relationship between SES and depression in females.

Table 14

Parental Nurturance as a Mediator of SES in Females

Step of Analysis	Variable	Standardized	<i>t</i> -ratio	<i>p</i>
Series	Entered	Coefficient β		
Step 1	SES ^a	-.09	-2.71	<.007
Step 2	Parental nurturance ^a	-.49	-16.28	<.001
Step 3	SES ^b	.11	3.26	<.001
Step 4	Parental nurturance ^a	-.49	-16.06	<.001
	SES ^a	-.04	-1.31	<.19

^a Dependent variable = depression score

^b Dependent variable = parental nurturance

Female subsample: Parental rejection. As already mentioned, in accordance with step 1, SES was shown to significantly predict depression in females, $R^2 = .009$, $p < .007$. In accordance with step 2, parental rejection was a significant predictor of depression score, $R^2 = .179$, $p < .001$. However, in regards to step 3, SES was not a significant predictor of parental rejection, $R^2 = .003$, $p < .081$. Therefore, the risk variable did not predict the mediator, and the mediational model was not borne out by the data according to the criteria delineated by Baron and Kenny (1986).

Male subsample. At step 1, SES did not predict depression in the male subsample, $R^2 = .000$, $p < .93$. Thus, SES was not a risk factor for depression in males, and all

subsequent analyses pertaining to both parental nurturance and parental rejection were dropped.

Summary of Question 6 results. Parental nurturance was found to be a significant mediator of the relationship between SES and depression in the female subsample. As SES was not related to parental rejection in the female subsample, parental rejection was not found to be a mediator of the relationship between SES and depression for females. For the male subsample, SES and depression were not significantly related. Thus, SES is not a risk factor for depression in males, and mediational models become irrelevant.

Summary of Results

For the total sample of early adolescents, the six predictors that accounted for a total of 42% of the variance in depression score, presented in order of entry from first to last, were: self-esteem, hyperactivity/inattention, parental nurturance, parental rejection, conduct problems, and peer relations. For the female subsample, the five predictors that accounted for a total of 49% of the variance in their depression scores, presented in order of entry from first to last, were: self-esteem, hyperactivity/inattention, parental nurturance, parental rejection, and conduct problems. For the male subsample, a total of 36% of the variance in their depression scores was accounted for by the following six predictors, presented by order of entry from first to last: self-esteem, parental rejection, parental nurturance, hyperactivity/inattention, peer relations, and conduct problems.

For both males and females, self-esteem was found to be a partial mediator of the relationship between both parental nurturance and depression, and parental rejection and depression. In females only, the relationship between SES and depression was mediated

by parental nurturance. Females were found to have a significantly higher level of depressive symptoms than males.

Chapter V: Discussion

In this chapter, the findings of this study will be discussed. First, the major findings will be highlighted, followed by a detailed examination of each finding in the context of knowledge already accumulated by previous researchers. Next, the implications suggested by the results of this study will be discussed. Finally, limitations and weaknesses of this research study that may constrain the generalizability of these results will be offered. This chapter will conclude with suggestions for future research in the field of depression in youth.

Major Findings

Many different variables have previously been associated with risk for depression in early adolescence. Prior to this study, it appeared that no researchers in the past decade had examined how the common predictors of depression might work together in the creation of risk for depression, and more specifically, if these effects might differ by gender. Furthermore, in this field of research, there is a paucity of data regarding potential mediators of risk variables in relationship to depression (Garber & Flynn, 2001). The present study attempted to address these research questions by identifying the most significant risk factors for depression in early adolescents from among a larger group of common predictors. Gender differences, and several potential mediational models, were also investigated.

The major findings from this study are several. First, in a sample of 2014 early adolescent participants, six risk factors out of a group of nine common predictors were identified as explaining 42% of the variance in depression scores. Second, when males and females were examined separately, considerable differences emerged in the amount

of total variance explained by the risk factors (36% and 49%, respectively), with the risk factors for males and females differing slightly. Third, for both the entire sample, and for the male and female subsamples, self-esteem emerged as the risk factor explaining the majority of the variance in depression score. Fourth, females were found to have a significantly higher level of depressive symptoms than males. Fifth, self-esteem was found to partially mediate the effects of both parental nurturance and parental rejection on depression, in both male and female subsamples. Lastly, for the female subsample, parental nurturance was found to mediate the effects of SES on depression. Each of these findings will be discussed in detail below.

General Questions Addressed

Question 1: What Risk Factors are the Best Predictors of Depression?

The following nine variables were examined for their relationship to depressive symptoms: perceived quality of peer relationships, perceived parental rearing behavior (both parental nurturance and parental rejection), self-esteem, body image, pubertal status, SES, conduct problems, and hyperactivity/inattention. It was hypothesized that peer relationships, perceived parental rearing behavior (both parental nurturance and parental rejection), and self-esteem would make significant unique contributions to depression scores. This hypothesis was based primarily on the amount of empirical evidence previously compiled on these four variables and their predictive value. These four variables have had the most consistent and well-demonstrated associations with depression in children and adolescents across studies, relative to the limited evidence compiled for the remaining five variables.

The six variables found to explain a total of 42% of the variance in depression score were: self-esteem, hyperactivity/inattention, parental nurturance, parental rejection, conduct problems, and peer relations. Thus, the hypothesis for Question 1 was partially supported; the combination of risk factors that entered into the final equation did include the hypothesized variables, but also included other variables that were not expected.

Included variables. Self-esteem accounted for 31% of the explained variance in depression score, with the other predictors each accounting for no more than 5% of the remaining unique variance. The finding that self-esteem is a strong predictor of depressive symptoms was expected, based on the body of research that currently exists to support self-esteem as a risk factor for depression in early adolescents (see Cole et al., 2001; Garber et al., 1997; Marcotte et al., 2002; Muris et al., 2001; Robertson & Simons, 2001; Siegel, 2002; Southall & Roberts, 2002). However, as stated in Chapter II, previous studies have only examined self-esteem in relationship to a few other risk factors. The current finding, that self-esteem emerged from a group of nine common risk variables as the best predictor of depression by a considerable margin, would seem more noteworthy.

Therefore, it would appear that being dissatisfied with self, and holding a view of self as ineffective and lacking in positive qualities places early adolescents at substantial risk for depressive symptoms. The theoretical relationship between self-esteem and depression has been outlined by various theorists. In Beck's (cognitive) theory of the negative triad, a negative view of self is considered central to the development of depression⁹ (Rehm et al., 2001). In Rehm's (cognitive behavioral) self-control theory⁹, self-esteem is also given a crucial role in the development of depression (Cole et al.,

⁹ See Chapter II for further discussion.

2001). In fact, a review of all major theories of depression outlined in Chapter II revealed that a negative view of self is somehow included in the majority of explanations of depression etiology. With this realization, it follows that self-esteem would predict depression above all other risk factors included here.

With regards to parental nurturance and parental rejection, their inclusion in the final regression model was also expected, as there already exists a considerable body of research demonstrating such relationships (see Aydin & Oztutuncu, 2001; Beam et al., 2002; Diego et al., 2001; Garber et al., 1997; Ge et al., 1994; Herman-Stahl & Petersen, 1999; Lau & Kwok, 2000; Liu, 2003; Muris et al., 2001; Nolan et al., 2003; Robertson & Simons, 1989; Sagrestano et al., 2003). However, given the volume of research supporting the relationship of parental nurturance and parental rejection to depression, it was unexpected that these two variables would explain such a small portion of the variance in depression score (a combined total of 5%). This finding is revisited during the discussion of Question 4 below.

Previous researchers have theorized about potential reasons why low levels of parental nurturance and high levels of parental rejection are predictive of depression in youth. One explanation is that children internalize their parents' lack of nurturance and rejection, leading children to develop a negative view of self, and thus an elevated risk for depressive symptoms (Muris et al., 2001; Robertson & Simons, 1989; Sagrestano et al., 2003). This explanation is consistent with the assertions of attachment theorists, who state that a child's sense of self, and their subsequent self-esteem, is determined by the quality of the attachment relationship formed with parents (Duggal et al., 2001; Graham & Easterbrooks, 2000).

Other explanations appear most consistent with interpersonal theories of depression, which emphasize the role of chronically stressful and problematic social interactions in causing a view of self as incompetent, which then leads to the development of depression (Kazdin & Marciano, 1998). One such explanation for the relationship between parental rearing behavior and depression is that the negative interpersonal modeling provided by parents who lack nurturance and reject their children teaches their offspring maladaptive methods of interaction, and of emotion regulation (Rudolph et al., 2000). Developing and maintaining satisfying relationships with peers and managing negative emotions becomes difficult, leaving these children isolated and vulnerable to depression (Liu, 2003). Others have suggested that children experiencing little nurturance and much rejection from their parents are left without the stress-buffering benefits afforded by a supportive parent-child relationship, leaving them vulnerable to depression in the face of life stress (Ge et al., 1994).

The results of Question 1 do not provide a means of determining which, if any, of these theories might be most plausible. However, one mediational model tested in this study provides further information which renders one of the above theories more persuasive than the others (see Question 4). Hence, these theories will be revisited later in this chapter when the results of that model are discussed.

With regards to peer relations, its inclusion in the final model was also expected, based on the body of research previously demonstrating the relationship between interpersonal competence and depression in youth (Beam et al., 2002; Beardslee & Gladstone, 2001; Bell-Dolan et al., 1993; Garland & Fitzgerald, 1998; Rudolph et al., 1994; Segrin, 2000; Segrin & Abramson, 1994; Tani et al., 2001). In light of this body of

research, it was again surprising to find that when examined in association with other common risk factors, peer relations explained such a tiny portion of unique variance in depression score (less than 1%). This unexpected finding serves to highlight the importance of considering common risk factors as a group, so that relative importance of each factor can be determined.

The relationship of interpersonal relationships to depression in early adolescents has been explained by the creators of interpersonal theories of depression. According to these theorists, stressful interpersonal relations will, over time, interfere with the attainment of normal developmental tasks, such as a healthy view of self (Rudolph et al., 2000). Consequently, peer relations may have explained only a small portion of unique variance in this study because this risk factor may have its strongest effects on depression through self-esteem (self-esteem entered prior to peer relations, perhaps taking up much of the unique variance accounted for by peer relations). Future research investigating the mediational effects of self-esteem on the relationship between peer relations and depression is needed to address this question.

With regards to the remaining two significant predictors, hyperactivity/inattention and conduct problems, their inclusion in the final model was quite unexpected, in that there appears to be almost no previous evidence demonstrating the predictive value of these variables in relationship to depression in youth. In particular, it appears that the predictive value of hyperactivity/inattention, entering at step 2 of the final model (explaining 5% of unique variance), has never before been demonstrated. Only one prior study was located in which the predictive value of conduct problems had been

investigated, with conduct problems explaining 7% of the variance in the depression score (Compton et al., 2003).

When considering symptoms of one disorder (in this case, Conduct Disorder and AD/HD) as a predictor of another disorder (in this case, depressive symptoms), one must consider that although co-occurring disorders may be causally related to each other, it may also be the case that apparent symptoms of one disorder (AD/HD or Conduct Disorder) are actually reflecting elevated levels of the other disorder (depression) (Compton et al., 2003). However, given that hyperactivity/inattention and conduct problems did predict depressive symptoms in this study, and that AD/HD and Conduct Disorder typically precede the development of depressive symptoms (Angold & Costello, 1993; Avenevoli et al., 2001; Cicchetti & Toth, 1998; Merikangas & Avenevoli, 2002), it would seem that one could tenuously suggest the potential of a causal relationship between depression and these two disorders. Longitudinal studies following children diagnosed with AD/HD or Oppositional Defiant Disorder/Conduct Disorder over time are needed to shed further light on the nature of the relationship between depression and these disorders.

Excluded variables. Body image, pubertal status, and SES did not enter the final model, and were not expected to do so. The relationship between body image and depression may only be a significant risk factor for females (Adams, Katz, Beauchamp, Cohen, & Zavis, 1993; Benjet & Hernandez-Guzman, 2002; Cole et al., 2001; Franko & Striegel-Moore, 2002; Hankin & Abramson, 2001; McCauley O'hannessian et al., 1999). The relationship between pubertal status and depression has been inconsistent across studies, as has the relationship of SES to depression (see Chapter II for further

discussion). The relationship of these variables to depression is discussed further under Question 2.

Summary. The results of Question 1 shed new light on previous research in the domain of risk factors for depression. Although all nine variables included in this study have been associated with depression in past studies, an interesting, and at times unanticipated, picture emerges when these variables are examined as a group. Variables that were expected to have strong predictive power based on the results of previous work did not always demonstrate such relationships when placed into the context of a group of other potentially strong predictors. Most striking was the emergence of self-esteem as the strongest predictor of depression. The implications and limitations of these findings will be discussed in a later section of this chapter.

Question 2: Do the Risk Factors Have Differential Importance for Males and Females?

The sample of early adolescents was divided by gender in order to investigate potential differences in the predictive power of the same nine risk factors by gender. It was hypothesized that differences would exist in the combination of variables that emerged as significant predictors of depression for boys and girls, specifically, that peer relations and body image would enter the final model for females but not males. This hypothesis was based on previous findings that demonstrated a relatively consistent pattern of gender differences in the impact of peer relations and body image on depression (see Hankin & Abramson, 2001; Kovacs et al., 2003; Marcotte et al., 2002; Rudolph et al., 2000; McCauley Ohannessian et al., 1999; and Siegel, 2002, for examples).

Female subsample: Included variables. The final group of predictors for the subsample of females, presented according to order of entry in the regression model, consisted of self-esteem (35% of variance), hyperactivity/inattention (7% of variance), parental nurturance (4% of variance), parental rejection (2% of variance), and conduct problems (less than 1% of variance). These five predictors accounted for a total of 49% of the variance in the depression scores of females.

As was the case for the total sample, self-esteem accounted for the majority of the explained variance (35%). Thus, in the female subsample, being dissatisfied with one's self, and holding a view of self as ineffective and lacking in positive qualities remained the strongest predictor of depressive symptoms by a considerable margin.

As was also the case for the total sample, hyperactivity/inattention entered at step 2, which was totally unanticipated for the female subsample, given that girls are three times less likely than males to exhibit symptoms of AD/HD (Barkley, 1998). Equally surprising was the inclusion of conduct problems in the final model for females, as males are much more likely to demonstrate this type of behavior (McMahon & Wells, 1998). Consequently, girls with comorbid externalizing behaviors, although a relatively small group, appear to be at elevated risk of also experiencing depression. As stated in the foregoing discussion of Question 1 results, it is potentially the case that apparent symptoms of attention regulation problems or conduct problems may simply be a reflection of elevated levels of depression (Compton et al., 2003). However, the argument that a causal relationship may also exist remains a plausible suggestion, and one that requires more attention in future longitudinal studies.

With regards to parental nurturance and parental rejection, their inclusion continued to explain only a small portion of unique variance in the female subsample. As previously noted, many studies have documented a strong relationship between parental rearing behavior and depression, and some have found that girls are more negatively impacted by problematic parental rearing behavior than boys (Ge et al., 1994; Liu, 2003). A potential explanation for the small portion of variance explained by these variables is offered later in this chapter, when the results of Question 4 are discussed.

Female subsample: Excluded variables. The exclusion of body image and peer relations from the final model was surprising, and contradicts the hypothesis that these two variables would be significant risk factors specific to females. Previous studies indicate that females are at particular risk for depression as a result of problematic peer relationships (Hankin & Abramson, 2001; Rudolph et al., 2000), and yet peer relations was not a significant predictor of depression for the females in this study. Body image, a risk factor considered to be largely specific to females (see Kovacs et al., 2003; McCauley Ohannessian et al., 1999; and Siegel, 2002, for examples), did not enter the final model.

Pubertal status was the third variable excluded from the final model for females. This variable has also been found in some studies to place females at particular risk (Benjet & Hernandez-Guzman, 2002; Ge et al., 2001a), but has not been found to be a significant predictor by other researchers (Marcotte et al., 2002).

Hence, in the context of other common risk factors, these three previously influential risk factors (peer relations, body image, and pubertal status) did not demonstrate significant effects. It could be that these three risk factors are secondary in

influence when compared to the five risk factors comprising the final model. However, other explanations are also possible. In regards to body image, it may be that body image becomes a more salient risk factor for depression as females progress into adolescence (the females here were only 12 and 13 years of age). This suggestion is supported by the findings of Adams et al. (1993), who reported that young adolescent females were significantly less dissatisfied with their physical appearance than females in a later stage of adolescence.

The risk for depression associated with puberty (Hayward & Sanborn, 2002; Kessler et al., 2001; Laitinen-Krispijn, et al., 1999; Piccinelli & Wilkinson, 2000), may only exist during a specific time period, possibly only during pubertal transition. Both Ge et al., (2001a) and Ge et al., (2001b) found that pubertal status was only related to depressive symptoms when it was measured at specific points in development. It was concluded by these groups of researchers that if pubertal status was assessed too early or too late in development, its association with depressive symptoms would not be detected.

In the current sample, most were pubertal (only 81 participants out of a total of 2014 indicated they had experienced no sign of puberty), and females were significantly further along in their pubertal development than males. Furthermore, over half of the sample (1021 participants) indicated that pubertal development appeared complete. Therefore, at the time of sampling, the window of risk may have long passed. Future research investigating the depressive symptoms of a group of youth during the time of pubertal onset would provide more clarity regarding this remaining question.

The exclusion of SES from the final model in the female subsample was expected. Several prior studies have not found SES to have significant association with depression

in youth (Liu, 2003; Robertson & Simons, 1989; Waschbusch et al., 2003). Instead, it was expected that SES would have its strongest effects on depression through its impact on parenting practices. This model was tested, and the results are discussed under Question 6.

Male subsample: Included variables: The final group of predictors, presented by order of entry, included self-esteem (26% of variance), parental rejection (4% of variance), parental nurturance (2% of variance), hyperactivity/inattention (2% of variance), peer relations (1% of variance), and conduct problems (less than 1% of variance). These six predictors accounted for a total of 36% of variance in the depression scores of the male subsample.

Once again, self-esteem accounted for the majority of the explained variance in depression scores in the male subsample by a considerable margin (26%). Parental rejection and parental nurturance continued to explain only a small portion of variance (a total of 6%), which, as previously discussed, was unexpected. See Question 4 below for further discussion of why this might be the case.

The inclusion of hyperactivity/inattention and conduct problems in the final model for males was not entirely surprising, given the predominance of these disorders in the male population (Barkley, 1998; McMahon & Wells, 1998), and the high level of comorbidity associated with depression (Alpert et al., 1999; Avenevoli, Stolar, Li, Dierker, & Merikangas, 2001; Brockless, 1997; Kovacs, 1998; Reynolds & Johnston, 1994). However, as already mentioned in the foregoing discussion, the predictive value of these variables in relationship to depression appears to have been rarely demonstrated

prior to this study, and a causal relationship between these behavior problems and depression has not yet been discounted.

As stated in Chapter II, Kovacs et al. (2003) reported that depressed females are much more likely to exhibit a comorbid behavioral condition, relative to non-depressed females, non-depressed males, and depressed males. This finding, and the results of this study (in which externalizing problems demonstrated higher associations with depression in females compared to males) converge to suggest that externalizing problems could be more strongly linked in females than in males. Given the relative rarity of AD/HD and conduct disorder in the female population, those females with such disorders could potentially feel particularly stigmatized. Subsequently, these females might develop poor self-esteem, which, according to the results of this study, places adolescents at risk for depression. Empirical examination of such a connection is needed, and is an interesting avenue for future research. Regardless, at this point it can be concluded that females with externalizing problems are a distinct group that should be screened more closely with regards to depression.

Peer relations was the only risk factor to differ by gender; this variable was included in the final model for males but not females. This finding is contrary to the hypothesis stated earlier, that peer relations would be a significant risk factor only for females. Prior research has shown that adolescents with problematic peer relationships are higher in depressive symptoms than those without such problems (see Bell-Donan et al., 1993, and Garland & Fitzgerald, 1998, for examples). In the current sample, males reported significantly more interpersonal problems than females [$F(1) = 44.87, p < .001$]. Hence, the finding that peer relations had a significant impact for males but not for

females in this study might simply be a reflection of the significantly higher level of interpersonal problems in this particular male sample. More research examining gender differences in the impact of peer relations on depression is needed in order to provide more clarity regarding this finding.

Male subsample: Excluded variables. Pubertal status, body image, and SES were not included in the final model for males. The exclusion of pubertal status and body image in final model for males was expected, as research has formerly demonstrated these variable to place females at greater risk for depression than males (see Benjet & Hernandez-Guzman, 2002; Ge et al., 2001a; Kovacs et al., 2003; McCauley Ohannessian et al., 1999; and Siegel, 2002, for examples). The exclusion of SES was also expected, for reasons already outlined earlier in the chapter.

Summary. The results of Question 2 reveal that the group of risk variables examined in this study explained much more of the variance in depression scores for females than was explained for males (49% and 36%, respectively). Thus, the risk variables included in this study were much more efficacious in predicting the depression scores of early adolescent females. Had other risk factors, such as parental depression and other, “independent” (those events over which children have no control) negative life events been included in this study, much more of the variance in depression scores may have been accounted for, in both males and females. Replication of this study with the inclusion of these variables would provide further insight into other important risk factors for depression.

The hypothesis for Question 2 was not supported. It was hypothesized that peer relations and body image would be salient risk factors for females, but not for males.

However, peer relations emerged as a significant risk factor only for males, and body image was not a significant risk factor for either gender. Nevertheless, two gender differences were particularly interesting, specifically, the stronger association between hyperactivity/inattention and conduct problems in females, and the difference in the total variance explained by the final models. The implications and limitations of these findings will be discussed in a later section of this chapter.

Question 3: Do the Gender Differences Known to Exist in Depression Rates Exist at Early Adolescence?

The depression scores of males and females were compared to investigate the hypothesis that significant gender differences existed in the prevalence of depression in for 12- and 13-year olds. The hypothesis that females would exhibit significantly more depressive symptoms than males was confirmed. This finding is aligned with many other studies reporting the same result (see Angold et al., 2002; Benjet & Hernandez-Guzman, 2002; Cole et al., 2002; Ge, et al., 1994; Holsen et al., 2000; Laitinen-Krispijn et al., 1999; and Silberg et al., 1999), but stands in contrast to other studies reporting no gender differences until the age of 14 or 15 (Garber et al., 2002; Seiffge-Krenke & Stemmler, 2002; Wade et al., 2002). These conflicting findings will likely continue, as researchers employ different measures, informants, and criterion to measure depression and depressive symptoms. What can be concluded on the basis of the current results is that interventions designed to prevent the female predominance in depression must be undertaken early, certainly prior to age 12.

Mediational Models Tested

Question 4: Does Self-Esteem Partially Mediate the Relationship Between Parental Rearing Behavior and Depression, in Both Males and Females?

The sample was divided according to gender, in order to investigate the mediational effects of self-esteem on the relationship of both parental nurturance and parental rejection to depression. It was hypothesized that self-esteem would function as a partial mediator in this relationship for both genders, a finding that has been formerly demonstrated several times (Garber et al., 1997; Muris et al., 2001; Robertson & Simons, 1989). This hypothesis was confirmed; self-esteem partially mediated the relationship of both parental nurturance and parental rejection to depression, in both males and females. Therefore, parental nurturance and parental rejection are related to depression, in part, through the impact of these variables on a child's self-esteem (i.e., parental rearing behavior negatively impacts upon a child's view of self, which in turn creates risk for depression).

The results of this mediational model elucidate the reason for the earlier finding (in both Question 1 and Question 2), that parental nurturance and parental rejection accounted for only a small portion of variance in depression scores. In Questions 1 and 2, much of the variance accounted for by the parenting variables would have been explained by the previous entry of self-esteem into the regression equation. This point of clarification is important, as the crucial importance of parental rearing behavior to the depressive symptoms of youth is somewhat "disguised" by the results of Questions 1 and 2.

These results also provide empirical support for one of the theories created to explain the relationship of parental rearing behavior to depression in youth (outlined in an earlier section of this chapter). The current model indicates that parental rearing behavior negatively impacts upon a child's view of self, which in turn creates risk for depression. This model is consistent with the theory arising from the field of attachment research, in which it is stated that elevated risk for depression is created when children internalize their parents' lack of nurturance and rejection, subsequently develop a negative view of self, and become depressed (Duggal et al., 2001; Graham & Easterbrooks, 2000).

The question remains though, of what other risk factors, if any, mediate the relationship between parental rearing behavior and depression. In another theory outlined in an earlier section of this chapter negative interpersonal modeling was implicated as the means through which parental rearing behavior causes depression (Rudolph et al., 2000). Hence, future researchers might examine interpersonal skill in youth as an additional partial mediator of the relationship between their depression scores and parental rearing behavior.

Question 5: Is the Relationship Between Pubertal Status and Depression Mediated by Self-Esteem and Body Image, in both Males and Females?

The sample was again separated by gender, in order to investigate the mediational effects of self-esteem and body image on the relationship between pubertal status and depression. It was hypothesized that both variables would function as mediators of this relationship, as a small group of researchers have found (Marcotte et al., 2002) or suggested (Benjet & Hernandez-Guzman, 2002; Franko & Striegel-Moore, 2002) this to

be the case in past research. This hypothesis was not confirmed, as pubertal status was not a significant predictor of depression scores in either the male or the female sample.

The non-significance of pubertal status as a predictor of depression has been reported previously (Angold & Rutter, 1992; Laitinen-Krispijn, et al., 1999; Sagrestano et al., 2003). The potential reason for this finding, that there may be a “sensitive period” in which puberty and depression are related, has already been presented above.

Question 6: Does Parental Rearing Behavior Mediate the Relationship Between SES and Depression, in both Males and Females?

Males and females were examined separately. It was hypothesized that parental rearing behavior (parental nurturance and parental rejection) would mediate the relationship between SES and depression in both male and female subsamples. This hypothesis was only partially supported; the impact of SES on depression was mediated only by parental nurturance, and only in the female subsample.

Consequently, females, but not males, from low SES backgrounds are placed at significant risk for depression when they experience low levels of warmth and nurturance from parents. Earlier studies have reported that females are more vulnerable to depression as a result of negative parenting practices than males (Ge et al., 1994; Liu, 2003). Other studies have demonstrated that parental rearing behavior is more problematic among families of low SES (Kim & Ge, 2000; Liu, 2003; McLoyd, 1998; Sheeber et al., 2001). Still others have found that SES significantly predicts depression (Graham & Easterbrooks, 2000; Siegel, 2002). However, it appears no other studies conducted in the past decade have demonstrated the mediational effects of parenting behavior on the relationship between SES and depression in female adolescents. This finding brings to

light a second distinct group of early adolescents, females with low SES backgrounds, who would be at risk for depression when parental nurturance is lacking. Such knowledge has direct implications for prevention efforts, which will be discussed in more detail below.

Implications of the Present Findings

This study was intended to inform prevention efforts, by identifying the most salient risk factors for depression in need of targeted intervention from among a larger group of common predictors. Although preliminary, and not without limitations, several findings from this study have clear implications for prevention and intervention programs.

First and foremost, low self-esteem seems to be a critical risk factor for depression in early adolescents, a finding that does not differ by gender. Thus, interventions designed to alleviate or prevent this negative cognitive pattern appear crucial to the prevention of depression. Furthermore, given that parental rearing behavior was identified as a risk factor for low self-esteem, and for depression, it would seem equally vital to provide families exhibiting significantly difficult parent-child interactions with support in effective parenting practices. Parents with female children living in a low socioeconomic bracket appear particularly important to target for intervention, as a low level parental nurturance in such families was shown to be a mediating factor in whether or not these females will become depressed.

An additional group of early adolescents was identified as being at particular risk for depression; females with externalizing behaviors. Although this connection requires much more research attention, the current results suggest that females, more so than

males, may be at risk for depression when externalizing behaviors are present. Thus, such females are in need of special attention in this regard.

The findings of this study also identify a need for further exploration of additional risk factors for males. The risk factors examined here demonstrated relatively adequate predictive value for females, but relatively less predictive value for males. Although females are most frequently afflicted with this disorder, the difficulties experienced by depressed males are not in any way diminished. In order to more effectively prevent depression in males, additional influential risk factors must first be identified.

Finally, it was demonstrated that females exhibit a significantly higher level of depressive symptoms than males at ages 12 and 13. Thus, any efforts toward prevention of the female predominance in depression rates must be undertaken in childhood, and certainly before females reach adolescence.

Limitations and Strengths of this Study

The strengths of this study include a large sample size, the inclusion of many of the most relevant predictors of depression identified to date, and the examination of risk factors by gender. Although this study represents a step forward in the understanding of risk factors for depression, there are several limitations that must be noted when considering these results. For the most part, the measures used in this study were reliable and valid instruments, with the exception of the measures used to detect hyperactivity/inattention and conduct problems. These two measures have questionable reliability and validity, due to the fact that no previous researchers have examined their psychometric properties. Secondly, all of the measures used in this study were employed in short versions. Although these most of measures had been found to remain valid when

shortened (see Chapter III), the exact content of each shortened version had not been consistent across studies. Therefore, it is difficult to say with certainty that the psychometric properties of the measures used in this study were not weakened by these abbreviations.

Next, it is important to note that all the data used in the study were self-reported, resulting in the potential that common-method variance influenced the results. This is an additional weakness of this design, but it is important to note that many researchers have asserted that children's or adolescents' perceptions of reality, although perhaps biased, are likely the most indicative of their subsequent cognitive, emotional, and behavioral reactions (Beam et al., 2002; Garber & Flynn, 2001b; Kim & Ge, 2000; Sagrestano et al., 2003; Steinhausen & Winkler-Metzke, 2001).

Additionally, two other risk factors, parental depression and independent negative life events, were not included in this design, for reasons detailed previously. The inclusion of parental depression would likely have resulted in more explained variance in both male and female samples, and potentially in a different combination of predictors entering the final model. Not having access to the parental depression variable from the NLSCY is a major weakness of this design. The inclusion of independent negative life events might also have resulted in more explained variance.

Furthermore, the fact that the majority of this sample was pubertal eliminated the possibility of examining the risk for depression created by pubertal transition. As a result, it is difficult to discern the true effects of puberty on depression from the data available in the current sample.

Finally, it is important to note that one of the assumptions upon which regression analysis is based was violated (see Chapter IV). Although regression analysis is quite robust against such violations (StatSoft, 2004), this violation revealed that the current regression model predicted lower depression scores better than higher depression scores. This pattern may have resulted from the fact that the majority of this sample demonstrated a low level of depressive symptoms. Regardless, this observation does place limitations on the generalizability of these results to early adolescents who demonstrate severe symptoms of depression. It should also be reiterated that this study pertains only to the prediction of depressive symptoms, and not to the prediction of depression. As such, further constraints are placed on the generalizability of these results to a clinically depressed population.

Suggestions for Future Research

It would be highly useful to extend the results of this research by conducting a longitudinal study. Results of such a study could provide further evidence with respect to the developmental stability of these risk factors. The addition of parental depression and negative life events as predictors, and the inclusion of children in the process of pubertal transition in future research studies could also further the knowledge presented here.

In this study, self-esteem partially mediated the relationship between parental rearing behavior and depression. As discussed earlier, interpersonal theorists hypothesize that parental rearing behavior may also be related to child depression through negative interpersonal modeling. Thus, another potential partial mediator of the relationship between parental rearing behavior and depression may be interpersonal skill. Future

research in this area could provide more support for the theoretical positions posited by the interpersonal theorists.

Finally, future research on risk factors for depression should be conducted with greater attention to gender differences. The results presented here indicate that although males and females have risk factors in common, those risk factors have differential salience for males and females. It seems that the link between externalizing disorders and depression in females is a research area in particular need of further examination. In addition, it seems other risk factors may exist for males that have not yet been considered.

Summary and Conclusions

The present study sought to identify the most salient risk factors for depression in both male and female early adolescents. Six risk factors were identified, from a group of nine common predictors, as explaining unique portions of variance (self-esteem, hyperactivity/inattention, parental nurturance, parental rejection, conduct problems, and peer relations). When males and females were examined separately, the risk factors that entered the final model were similar (self-esteem, hyperactivity/ inattention, parental nurturance, parental rejection, and conduct problems entered for both genders), but did differ slightly (peer relations entered for males but not females). Much more variance was explained by these predictors for the females than for the males in this sample, suggesting the existence of other unexplored risk factors for males. Self-esteem was found to partially mediate the effects of parental rearing behavior on depression, and parental nurturance was found to mediate the effects of SES on depression for females. Females were found to exhibit significantly more depressive symptoms than males in this sample.

Self-esteem and parenting behavior most likely play major roles in the creation of depression in children. It is these variables that are recommended for special attention by those involved in the design of prevention and intervention programs. The longitudinal replication of this study is recommended in order to extend the knowledge presented here. As well, new studies that include parental depression, negative life events, and children in the process of pubertal transition, and those that pursue gender differences, are likely to be highly useful.

In conclusion, this study represents a step towards a more global and coherent picture of the factors that create risk for depression in youth. However, there is much that remains to be learned in this domain. With continued research attention of this kind, better and more effective intervention and prevention programs can be designed, so that fewer children will suffer the negative ramifications of a depressive disorder.

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Appendix A

*National Longitudinal Survey of Children and Youth*¹⁰

General information. The NLSCY is a longitudinal study, conducted through a partnership between Human Resources Development Canada (HRDC) and Statistics Canada. The project is designed to follow a representative sample of Canadian children, from newborn to age 11 years, into adulthood, measuring, at two-year intervals, various factors related to childhood health and wellbeing. The first wave of data was collected in 1994, and comprises Cycle 1. The data used in the current study, taken from Cycle 2, was collected in 1996, and was released in 1999.

Sampling method. As mentioned above, the target population for the NLSCY is children aged 0-11 years; these children were surveyed for Cycle 1 in 1994. This group of children was then reevaluated two years later to obtain the data for Cycle 2. Additionally, a new group of children aged 0-1 was added to the Cycle 2 sample to ensure cross-sectional representativeness at each wave of data collection.

The unit of analysis for this data is intended to be the child, but the sampling was conducted at the household level. Households with children aged 0-11 years were found using Statistics Canada's Labor Force Survey (LFS), which contains demographic information on a representative sample of Canadian households. Households with children were selected from the LFS to form the main component of the NLSCY sample. As well, households from the National Population Health Survey (NPHS) were randomly selected, and those households with a child aged 0-11 were also included. Because both the LFS and the NPHS excluded the Territories, Indian Reserves, and people living in

¹⁰ The information for this appendix was obtained from the Survey Documentation: User's Guide manual for Cycle 2 (Statistics Canada, 1999).

institutions, a sample was drawn from the population of privately occupied dwellings in the Territories. Any of the households in that sample with a child aged 0-11 were retained for the NLSCY.

Once the households were selected from the various sources described above, a maximum of two children from each household were chosen at random to participate in the NLSCY. The sample was allocated so that each of the 10 provinces contributed the appropriate amount of children based on its size (see Tables A1 and A2 for the sample distribution by province and by age, respectively). Each child was assigned a cross-sectional weight; these weights are adjusted during each cycle to reflect demographic estimates for province, age, and sex during that cycle, and erosion of the sample across cycles.

Table A1

Sample Distribution by Province

Province	Participants
Newfoundland	1,001
Prince Edward Island	545
Nova Scotia	1,293
New Brunswick	1,664
Quebec	3,757
Ontario	5,195
Manitoba	1,484
Saskatchewan	1,589
Alberta	1,827

British Columbia	1,670
TOTAL	20,025

Table A2

Sample Distribution by Age of Child

Age	Participants
0 years	1,962
1 year	2,192
2 years	1,898
3 years	1,968
4 years	1,532
5 years	1,396
6 years	1,308
7 years	1,110
8 years	1,143
9 years	1,018
10 years	1,186
11 years	1,054
12 years	1,195
13 years	1,063
TOTAL	20,025

Data Collection. Information was collected about the children in a wide range of areas, including biological, social, and economic topics, from parents (from the “person most knowledgeable”) and teachers. Depending on their age, data were also collected from the children themselves. Data were collected from the households either face-to-face or over the phone using Computer Assisted Interviewing, and from the schools using mail-out questionnaires. Interviewers were those from the LFS, and were trained in the concepts and procedures involved.

As part of the data collection procedure, children aged 10 to 13 years were asked to respond to a self-report questionnaire, consisting of a number of scales. Topics covered on the questionnaire administered to the 12- and 13-year olds included friends and family, school, feelings and behaviors, smoking, drinking, and drug use, activities, delinquent behavior, health, work, and sources of money. Measures were taken to ensure confidentiality, in order to increase the probability that the children would provide honest and complete information.

Appendix B

Original 20-item version of the CES-D¹¹

- 1) I was bothered by things that usually don't bother me.
- 2) I did not feel like eating; my appetite was poor.
- 3) I felt that I could not shake off the blues.
- 4) I felt that I was just as good as other people.
- 5) I had trouble keeping my mind on what I was doing.
- 6) I felt depressed.
- 7) I felt that everything I did was an effort.
- 8) I felt hopeful about the future.
- 9) I thought my life had been a failure.
- 10) I felt fearful.
- 11) My sleep was restless.
- 12) I was happy.
- 13) I talked less than usual.
- 14) I felt lonely.
- 15) People were unfriendly.
- 16) I enjoyed life.
- 17) I had crying spells.
- 18) I felt sad.
- 19) I felt that people disliked me.
- 20) I could not get "going".

¹¹ This information was taken from Radloff (1977).

12-item Version Used in this Study¹²

Participants were asked to choose one of the following four responses to each item: “rarely/none of the time”, “some/little of the time”, “occasionally/moderate time”, “most or all of the time”.

- 1) How often felt like not eating?
- 2) How often could not shake blues?
- 3) How often had trouble concentrating?
- 4) How often felt depressed?
- 5) How often felt too tired to do things?
- 6) How often felt hopeful about future?
- 7) How often had restless sleep?
- 8) How often felt happy?
- 9) How often felt lonely?
- 10) How often enjoyed life?
- 11) How often had crying spells?
- 12) How often felt people disliked you?

¹² This information was taken from the Data Dictionary (Statistics Canada, 1999).

Appendix C

*Abbreviated Version of the General-Self Scale from the SDQ used in the Current Study*¹³

Participants were asked to choose one of the following five responses to each item: “false”, “mostly false”, “sometimes false/sometimes true”, “mostly true” or “true”.

- 1) You like the way you are.
- 2) You have a lot to be proud of.
- 3) Lots of things about you are good.
- 4) You do things well.

¹³ This information was taken from the Data Dictionary (Statistics Canada, 1999). The original 8-item version (Marsh, Smith, & Barnes, 1983) was not available to the researcher, and thus was not included here.

Appendix D

Original Items from the Physical Appearance Scale of the SDQ¹⁴

1. I am good looking
2. I have a good looking body
3. I have a pleasant looking face
4. I am an attractive person
5. I'm better looking than most of my friends
6. Other kids think I am good looking
7. I like the way I look
8. I have nice features (e.g., nose & eyes)

Abbreviated Version of the Physical Appearance Scale used in this Study¹⁵

Participants were asked to choose one of the following five responses for each item:

“false”, “mostly false”, “sometimes false/sometimes true”, “mostly true” or “true”.

1. You are good looking
2. You have a pleasant looking face
3. Other kids think you look good
4. Your body looks good

¹⁴ This information was taken from Marsh, Smith, & Barnes (1983).

¹⁵ This information was taken from the Data Dictionary (Statistics Canada, 1999).

Appendix E

Original Peer Relations Scale of the SDQ¹⁶

1. I make friends easily
2. I get along with other kids easily
3. I have lots of friends
4. Other kids want me to be their friend
5. Most other kids like me
6. I am popular with kids my own age
7. I am easy to like
8. Most kids have more friends than I do

Abbreviated Version Used in the Current Study¹⁷

Participants were asked to choose one of the following five responses to each item: “false”, “mostly false”, “sometimes false/sometimes true”, “mostly true” or “true”.

1. I have a lot of friends
2. I get along with kids easily
3. Other kids want me to be their friend
4. Most other kids like me

¹⁶ This information was taken from Marsh, Smith, & Barnes (1983).

¹⁷ This information was taken from the Data Dictionary (Statistics Canada, 1999).

Appendix F

*Original Parenting Questionnaire: Nurturance Items*¹⁸

My parents (or stepparents or foster parents):

1. Give me a lot of care and attention
2. Listen to my ideas and opinions
3. Make their whole life center around me
4. Are interested in what I am learning at school
5. Let me go out any evening I want
6. Smile at me
7. Praise me
8. Speak of the good things I do
9. Seem proud of the things I do
10. Make sure I know I am appreciated
11. Reward me with extra privileges
12. Try to understand how I see things
13. Give me the choice of what to do whenever possible
14. Whenever we disagree about something, we solve the problem together

*Original Parenting Questionnaire: Rejection-Oriented Items*¹⁸

My parents (or stepparents or foster parents):

1. Soon forget a rule they have made
2. Punish me for doing something one day, but forget it the next day
3. Enforce a rule or do not enforce a rule depending on their mood

¹⁸ This information was taken from Lempers, Clark-Lempers, & Simons, 1989.

4. Nag me about little things
5. Hit me or threaten to do so
6. Only keep rules when it suits them
7. Get angry and yell at me
8. Have beaten me up
9. Threaten punishment more often than they use it
10. When we do have an argument, we stay angry a very long time

Abbreviated Version Used in this Study: Nurturance Items¹⁹

Participants were asked to choose one of the following five responses to each question: “never”, “rarely”, “sometimes”, “often”, or “always”.

My parents (or stepparents or foster parents):

1. Smile at me
2. Listen to my ideas and opinions
3. And I solve a problem together whenever we disagree about something
4. Make sure I know I’m appreciated
5. Speak of the good things I do
6. Seem proud of the things I do

Abbreviated Version Used in this Study: Rejection Items¹⁹

My parents (or stepparents or foster parents):

1. Soon forget a rule they have made
2. Nag me about little things
3. Only keep rules when it suits them

¹⁹ This information was taken from the Data Dictionary (Statistics Canada, 1999).

4. Threaten punishment more often than they use it
5. Enforce a rule or do not enforce a rule depending on their mood
6. Hit me or threaten to do so
7. Get angry and yell at me

Appendix G

*Conduct Disorder and Physical Aggression Scale*²⁰

Participants were asked to choose one of the following three responses to each item:

“never or not true”, “sometimes or somewhat true”, or “often or very true”.

1. I get into many fights
2. I react with anger and fighting
3. I physically attack people
4. I threaten people
5. I am cruel, bully or am mean to others
6. I kick, bite, or hit other children

²⁰ This information was taken from the Data Dictionary (Statistics Canada, 1999).

Appendix H

*Hyperactivity/Inattention Scale*²¹

Participants were asked to choose one of the following three responses to each item: “never or not true”, “sometimes or somewhat true”, or “often or very true”.

1. Can't sit still, am restless/hyperactive
2. I am distractible
3. I fidget
4. I can't concentrate, can't pay attention
5. I am impulsive, act without thinking
6. I have difficulty awaiting my turn
7. I cannot settle to anything for long
8. I am inattentive

²¹ This information was taken from the Data Dictionary (Statistics Canada, 1999).

Appendix I

Items used to Derive the Pubertal Status Variable for Girls²²

Participants were asked to choose one of the following four responses to each question: “not yet started”, “barely started”, “growth underway”, “growth seems complete”.

1. Has body hair begun to grow
2. Have your breasts begun to grow
3. Have you begun to menstruate

Items used to Derive the Pubertal Status Variable for Boys²²

Participants were asked to choose one of the following four responses to each question: “not yet started”, “barely started”, “growth underway”, “growth seems complete”.

1. Has body hair begun to grow
2. Has your voice gotten deeper
3. Do you have hair on your face

²² This information was taken from the Data Dictionary (Statistics Canada, 1999).