THE DIFFERENCE BETWEEN ECOLOGICAL CONTEXT AND TREATMENT
PROGRESS OF YOUNG GIRLS WITH COMORBID EXTERNALIZING AND
INTERNALIZING DISORDERS AND YOUNG GIRLS WITH ONLY EXTERNALIZING
DISORDERS

by

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A thesis submitted in conformity with the requirements
for the degree of Doctor of Philosophy
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Doctor of Philosophy, 2010
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ABSTRACT

Many children and their families who seek assistance for childhood behaviour disorders experience comorbid disorders, namely the presence of two or more disorders. Although comorbid disorders are recognized as a frequent clinical complication, minimal direction exists within the literature about the risk factors for comorbid conditions and how best to provide intervention services. In this study an ecological framework was used to compare the individual, family, and community environmental contexts of young girls who presented at intake at a children’s mental health centre with comorbid externalizing and internalizing disorders, and girls who presented at intake with externalizing disorders only. The treatment response to a cognitive-behavioural intervention for externalizing behaviour disorders was examined, by comparing externalizing scores over time between girls with comorbid externalizing and internalizing disorders and girls with externalizing disorders only. Additionally, internalizing scores over time for girls with comorbid disorders were examined. Results indicated that a history of abuse and a cluster of individual characteristics placed girls at higher risk to present with comorbid conditions. The results also indicated that girls with comorbid disorders experienced a reduction of both externalizing and internalizing symptoms. Only 1 in 7.4 girls, however, scored below the clinical range for both externalizing and internalizing disorders at the end of the treatment phase, in comparison to 1 in 5 girls scoring below the clinical range for externalizing disorders in the noncomorbid group.
ACKNOWLEDGEMENTS

I am most grateful to the girls and their families who willingly shared their experiences with researchers at the Child Development Institute in order to help others. I am also indebted to the Child Development Institute for allowing the use of data collected at the Agency for the purpose of this study. Thank you to my supervisor, Dr. Susan Stern, for her encouragement, support, and guidance during my doctoral studies. Thank you to my supervisory committee—Dr. Faye Mishna, Dr. Debra Pepler, and Dr. Leena Augimeri—for their feedback and support during this research project. In addition, I wish to thank my dear husband, Tim Gerrits, for his unfailing belief in me and his loving encouragement during this learning journey.
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CHAPTER 1
LITERATURE REVIEW

Introduction

This study is intended to establish strong evidence of the need for a proactive strategy in addressing the area of girlhood disruptive behaviour and co-occurring emotional disorders.

Children’s disruptive behaviour disorders are among the most frequent causes of referrals to children’s mental health services in both Canada and the United States (American Psychiatric Association, *Diagnostic and Statistical Manual of Mental Disorders* [4th ed., text revision], 2000; Benzies, Harrison, & Magill-Evans, 2004; Delligatti, Akin-Little, & Little, 2003; Henggeler & Sheidow, 2003; Kann & Hanna, 2000; Keenan, Loeber, & Green, 1999). According to the *DSM-IV-TR* (2000), general population studies indicate that the rate of conduct disorder (CD) ranges from under 1% to over 10% of the population. Children’s Mental Health Ontario (2002) reported the prevalence rate for CD in boys to be between 6% and 10%, and between 2% and 9% for girls. Waddell, McEwan, Hua, and Shepherd (2002) found somewhat lower prevalence rates (2 – 6%) for CD for children living in British Columbia.

Such children engage in antisocial and aggressive behaviour such as lying, stealing, bullying, pushing, shoving, punching, destroying property, and truancy (Hipwell et al., 2002; Lahey, Loeber, Burke & Rathouz, 2002). These behaviours cause harm to the victims, their families, and communities. Children engaging in these negative behaviours receive labels such as “troubled”, “no good” and “lost causes” and often find themselves rejected by prosocial peers. Too often children with problematic behaviour do not receive the same nurturing by teachers, team coaches, and other community members as their prosocial peers resulting in fewer opportunities for children with behaviour problems to develop to their full potential.

Common consequences of these disorders such as academic underachievement, school drop-out, adolescent substance abuse, parenthood during adolescence, problematic interpersonal
relationships, involvement with criminal justice system, and poverty all have serious negative implications for these children’s futures (Conduct Problems Prevention Research Group, 1999; Fergusson & Woodward, 2000; Fischer, Barkley, Smallish, & Fletcher, 2002; Kann & Hanna, 2000; Lewinsohn, Rohde, & Seeley, 1995). Gender specific consequences such as a strong correlation between boyhood behavioural problems and adult criminality (Farrington, 1991) and a correlation between girlhood behavioural problems and poorer physical and mental health in adulthood for women (Bardone et al., 1998; Webster-Stratton, 1996) indicate the need to conduct gender specific research to develop different prevention and intervention strategies.

Behaviour disorders do not occur in isolation. Approximately 60 to 70 percent of children experiencing mental health problems in Ontario experience multiple or comorbid disorders (Floyd, 2007; Offord, Boyle, Fleming, Monroe Blum, & Rae Grant, 1989). This finding is consistent in the literature and is not unique to Ontario. For example, Landy and Kwan Tam (1998) examined the prevalence rate for comorbidity within children at different ages using data from the first wave of the Canadian National Longitudinal Survey of Children and Youth. They detected a 21% rate of comorbidity for behaviour disorders for children at age 5, a 25% rate of comorbidity for behaviour disorders for children at age 7 and a 30% rate of comorbidity for behaviour disorders for children aged 8 to 12 (Landy, & Kwan Tam, 1998). Another study indicates that 70% of children referred to a prominent specialized clinical and research centre for children with behaviour problems in the United States have comorbid disorders (Kazdin, 1996).

Common comorbid conditions for children with behaviour disorders include Attention Deficit Hyperactivity Disorder (ADHD), Oppositional Defiant Disorder (ODD), anxiety, mood, and learning disorders (Angold, Costello, & Erkanli, 1999; Children’s Mental Health Ontario, 2001; Fergusson, Lynskey, & Horwood, 1996; Loeber & Keenan, 1994). The long-term
prognostic trajectories for children with comorbid disorders include more negative outcomes than for children with a single disorder. For example, children experiencing comorbid behaviour disorders have an increased likelihood of utilizing mental health services (Regier et al., 1993), of poorer overall functioning, of suicide attempts (Kovacs, Goldston, & Gatsonis, 1993), and academic problems (Lewinshohn et al., 1995). Researchers have identified that children with comorbid behaviour disorders have experienced harsher environments (Ge, Best, Conger, & Simmons, 1996; Kim et al., 2003; Moffitt, 1990; Shaw, Owens, Giovannelli, & Winslow, 2001) but to date more questions than answers exist as to why some children develop comorbid disorders and some children do not. Reciprocal relationships within the child’s immediate and extended environment influence the development of childhood disorders (Fraser, 1996; Loeber & Farrington, 2001). It is important when trying to identify why children develop comorbid behavioural disorders to take an ecological approach in order to ensure all relevant factors present within all levels of the child’s environment are considered.

Less is known about disruptive behaviour disorders for girls than for boys and even less is known about comorbid behaviour disorders in girls. Despite having a lower incidence rate for behaviour disorders girls are more likely to experience comorbid behavioural disorders than boys (Abram, Teplin, McCelland, & Dulcan, 2003; Keenan et al., 1999; Loeber & Keenan, 1994; Odgers & Moretti, 2002). For example, girls with CD have a high likelihood of developing comorbid CD and depression (Loeber & Keenan, 1994). Consequently girls are an especially vulnerable population.

Girls with comorbid CD and depression have higher rates of self-harm than girls who experience depression alone (Simic & Fombonne, 2001). Higher rates of self-harm alone are reason for concern, but another consequence for girls experiencing comorbid CD and depression is engaging in risky behaviours such as substance abuse much more frequently than girls with
CD alone. Higher levels of risky behaviours may possibly explain one finding in the literature that incarcerated girls experienced a higher rate of comorbid ODD and depression than either incarcerated boys or than girls living in the community (Ulzen & Hamilton, 1998). A strong need exists for researchers to focus on the factors correlated with girlhood behaviour and depressive disorders given the established frequency of this pairing and the known problematic consequences. Longer term consequences among women with childhood histories of comorbid CD and depression, in comparison to women with childhood histories of CD only, include more antisocial personality traits, depressive symptomology, and problems with global functioning (Fombonne, Wostear, Cooper, Harrington, & Rutter, 2001; Marmorstein & Iacono, 2001; Simic & Fombonne, 2001).

Children experiencing comorbid behaviour disorders have complicated treatment needs; however, little guidance exists as to how to intervene or divert these children’s negative trajectories. For example, should the clinician focus on all of the problems simultaneously, or should the clinician focus on addressing symptoms related to one disorder at a time, and if so in what order should groups of symptoms be addressed? These are all critical questions requiring answers.

Similar to the already documented gender bias within the literature on the contributing factors, and consequences of behaviour problems, program developers and evaluators also have focused more on interventions for boys than girls. The failure to conduct gender specific analysis of treatment outcome when research samples include girls is puzzling, particularly in light of known differential gender experiences. The assumption by researchers that significant findings are the same for both genders within mixed gender samples is faulty. Significant findings do not necessarily mean that members of both genders within the sample equally benefitted from the intervention. It is possible that the treatment impact for girls may be
negative but given the small proportion of girls in these samples the potentiality of this may go undetected. Consequently clinicians working with girls with behaviour disorders have less documented evidence available to direct their assessments, treatment planning and intervention strategies.

With few exceptions (Rohde, Clarke, Mace, Jorgensen, & Seeley, 2004; Weiss, Harris, Catron, & Han, 2003), most interventions are developed to address singular disorders despite the reality that in the “real world” clinicians are providing treatment services to many children experiencing comorbid disorders. The aim of this study is to increase the understanding of treatment needs for girls with comorbid problems by exploring how the risk profile and treatment response differs for girls with comorbid behaviour disorders in contrast to girls with behaviour disorders only. These differences are examined in the context of a cognitive-behavioural treatment program using an ecological framework (Bronfenbrenner, 1979). Consistent with the social work profession’s focus on understanding children within the context of their environment, the ecological framework makes it possible to understand the risk factors for girls with comorbid disorders across the different levels of their environment. Researchers likewise suggest that the best interventions for addressing childhood behaviour disorders focus on multiple domains within a child’s life such as the individual, family, school and community (Fraser, 1996; Loeber & Farrington, 2001). Too often interventions for childhood behaviour disorders are not ecologically informed and the focus for many is limited to the children and their parents.

The Agency in which this study is situated is the Child Development Institute (CDI). The Stop Now And Plan® Girls Connection (SNAP® GC) program developed by CDI staff is one of the few documented intervention programs specifically for girls with behaviour disorders (Levene, 1997). The SNAP® GC program’s theoretical framework is a developmental-systemic
model (Walsh, Pepler, & Levene, 2002) consistent with an ecological framework. The program developers recognized that children and their families require ongoing support and not just short-term services if lasting changes are to be achieved. Accordingly this is a multi-component program beginning with a comprehensive assessment and treatment plan development. Girls and their caregivers then participate in concurrent child and parent groups. The focus of the girls’ group is to assist girls in learning, practicing and generalizing prosocial problem solving and anger management skills (Levene, 1997; Pepler et al., 2010; Walsh et al., 2002). The parents’ group assists caregivers in developing parenting strategies to reduce problematic behaviour along with problem solving and anger management skills (Levene, 1997; Pepler et al., 2010; Walsh et al., 2002). The skills developed in the concurrent girls’ and parents groups’ are built upon in a subsequent program component – Girls Growing Up Healthy (GGUH) – and other adjunct services as needed and indicated by the assessment.

A retrospective evaluation of the SNAP® GC indicated that girls who remained in the clinical range at the end of the concurrent girls’ and parents’ groups were those who experienced comorbid disorders (Walsh et al., 2002). Findings from a recent quasiexperimental program evaluation study, “Bridging the Gender Gap,” (principal investigator, Dr. Debra Pepler) showed significant treatment gains for participants, however the treatment response of girls experiencing comorbid behaviour disorders was not separately examined (Pepler et al., 2010). The data available from the Bridging the Gender Gap is a rarely available data set on a gender specific program for girls with conduct problems, many of whom were experiencing comorbid disorders. As a result an opportunity to explore and compare the differences in risk factors and treatment response between girls with comorbid disorders and behaviour disorders only became available recently to address a significant gap in the literature.
Guided by the Ecological Framework (Bronfenbrenner, 1979) and using data collected during the Bridging the Gender Gap study, the goal of this study was to explore the differences in ecological risk profiles and treatment progress in young girls with comorbid behaviour disorders and young girls with only externalizing behaviour disorders. By comparing the previously unexplored differences between the two groups of girls, new knowledge of risk factors and their treatment response emerged. These findings can provide guidance for improving services for girls with comorbid behaviour disorders and direct future research.

**Disruptive Behaviour Disorders: Nature and Extent of the Problem**

Children’s disruptive behaviour disorders, also referred to as externalizing behaviour disorders, CD or ODD, are among the most frequent causes of referrals to children’s mental health services in both Canada and the United States (DSM-IV-TR, 2000; Benzies et al., 2004; Delligatti et al., 2003; Henggeler & Sheidow, 2003; Kann & Hanna, 2000; Keenan et al., 1999). Children with disruptive behaviour disorders repeatedly engage in antisocial behaviours such as deception, aggression towards people or animals, theft, destruction of others’ property, truancy, and other types of troublesome actions (Hipwell et al., 2002; Lahey, Loeber, Burke, & Rathouz, 2002). The actions of children with disruptive behaviour disorders are often consistent with the criteria established by the American Psychiatric Association (DSM-IV-TR, 2000) for CD.

**Prevalence of Conduct Behaviour Problems**

Although more than one type of disruptive behaviour disorder exists, the focus of this study (including prevalence statistics) is on CD specifically. An accurate identification of the actual rate of occurrence of CD within the general population of children is important in order to understand the scope of the problem that needs addressing (Loeber, Burke, Lahey, Winters, & Zera, 2000). Researchers have attempted to determine the incidence rate of CD in numerous studies; however, the actual rate of occurrence within the general population remains
controversial, because of the use of different operational definitions of this disorder, the application of different measurement instruments, and variations in reports by informants.

According to the *DSM-IV-TR* (2000), general population studies indicate that the rate of CD ranges from under 1% to over 10% of the population, with a higher occurrence in urban settings than in rural environments. Although it was reported in the *DSM-IV-TR* (2000) that the incidence rate of CD was higher for boys than for girls, specific statistics regarding said differences were not provided. Children’s Mental Health Ontario (2002) reported the prevalence rate for boys to be between 6% and 10%, and between 2% and 9% for girls. In the Ontario Child Health Study (OCHS), data were collected on a sample of 3,000 children across the province of Ontario (Offord, Lipman, & Duku, 2001). Based on teacher and parent reports, the prevalence rate of CD was 6.5% for boys and 1.8% for girls between the ages of 4 and 11 years (Offord et al., 2001).

In an attempt to clarify the incidence rate of CD within the Western, industrialized world, one review (Angold & Costello, 2001) compared the rates of CD across multiple studies using definitions from the *DSM-IV-TR* (2000) and from the *International Classification of Diseases (ICD-10)*; WHO, 2004), the diagnostic manual used in Europe. Results suggested that the rate of CD ranges from 5% to 10% of children between the ages of 8 and 16 years (Angold & Costello, 2001). However, this conclusion may be faulty, given the inconsistent diagnostic criteria for CD across the two diagnostic manuals. These differing diagnostic definitions along with the differing operational definitions used by researchers create challenges in determining the rate of CD within the population (Angold & Costello, 2001). As long as the diagnostic criteria used to define CD are still evolving, a firm estimate of the incidence rate will continue to elude researchers. As well, the persistence of this uncertainty is especially ensured by the fact that researchers not only use similar but different operational definitions but also conduct their
research among different populations (such as rural, suburban, urban, and significantly disadvantaged urban populations). It is important to know the differences in rates among these groups, since knowledge of these differences can provide important information regarding the environmental circumstances that are most harmful and beneficial to a child’s development. This will, in turn, provide useful direction regarding policy, prevention, and intervention initiatives.

**Short- and Long-Term Consequences of Childhood CD**

Documented short- and long-term consequences of childhood CD include academic underachievement, school drop-out, adolescent substance abuse, parenthood during adolescence, serious difficulties with interpersonal relationships in both adolescence and adulthood, involvement with the criminal justice system, unemployment, poverty, a diagnosis of adult antisocial personality disorder, mental health problems, addictions, depression, suicide, and being parents of the next generation of children with behaviour problems (Conduct Problems Prevention Research Group, 1999; Fergusson & Woodward, 2000; Fischer et al., 2002; Kann & Hanna, 2000; Lewinsohn et al., 1995). Although there are some common outcomes for both genders, there are gender differences in long-term consequences of childhood CD. For example, there is a strong association between boyhood conduct behavioural problems and both adult criminality (Farrington, 1991) and antisocial personality disorder that does not exist for girls (Lynam, Caspi, Moffitt, Loeber, & Stouthamer-Loeber, 2007). The long-term impact of girlhood conduct behavioural problems includes poorer physical health (Bardone et al., 1998) and mental health (Webster-Stratton, 1996); substance abuse, higher probability of teenage pregnancy, lower educational achievement, and higher probability of intimate relationships with abusive and antisocial partners, compared to girls without a history of conduct behavioural
problems (Bardone et al., 1998; Lahey, Loeber, Burke, & Rathouz, 2002; Webster-Stratton, 1996; Webster-Stratton & Reid, 2003).

**Comorbid Childhood Disorders**

Children referred to mental health services often experience more than one disorder. Such comorbid disorders result in complex situations that require intensive resources (Angold et al., 1999; Clarkin & Kendall, 1992; Kazdin, 1996). *Comorbidity* can be used to describe several situations. For example, it can refer to one individual who experiences more than one psychiatric disorder either concurrently or sequentially. *Familial comorbidity* refers to the presence of a psychiatric disorder in more than one family member (Angold et al., 1999; Clarkin & Kendall, 1992; Garnefski & Diekstra, 1997). *Homotypic comorbidity* refers to the experience of two or more disorders within the same family of disorders (such as two affective disorders), whereas *heterotypic comorbidity* refers to the experience of two or more disorders from different families of disorders (such as a mood disorder and a behaviour disorder; Angold et al., 1999). This study focuses on heterotypic comorbidity.

Despite the likelihood that the occurrence of comorbidity is not a recent phenomenon, formal discussion in the literature did not begin until the late 1980s. Although comorbidity now receives much more attention than previously to that date, research and our understanding of comorbidity and treatment protocols for children with comorbid disorders are still in the infancy stage (Angold et al., 1999; Doss & Weisz, 2006; Kazdin & Whitley, 2006; Ollendick, Jarrett, Grills-Taquechel, Hovey, & Wolff, 2008).

There is controversy within the literature about whether comorbid psychiatric conditions actually exist. Some researchers have suggested that the presence of comorbid conditions is purely a result of chance; however, epidemiological evidence demonstrates that the rates of
comorbidity are greater than chance (Angold et al., 1999; Lewinsohn, Rohde, & Seeley, 1995; Rhee, Hewitt, Corley, Willcutt, & Pennington, 2005).

At present, there is speculation, but no conclusive evidence, that there may be subcategories within disorders that are currently identified as comorbid conditions. For example, depressive conduct disorder (DCD) is identified in the *ICD–10* as different from CD (Angold et al., 1999; Simic & Fombonne, 2001). The answer to the questions about whether subgroups exist within various disorders that currently are considered to be comorbid disorders, or whether comorbid disorders exist, has potential implications for both research and treatment (Angold et al., 1999; Biederman, Faraone, Mick, & Lelon, 1995). Illustrative, one important finding by Simic and Fombonne (2001) was that children diagnosed with DCD differ in their patterns of CD symptoms. The data indicated that children with DCD were less destructive and showed fewer symptoms, such as stealing and fighting, than those with CD alone which indicates different treatment needs.

The literature includes discussions about the order in which disorders appear, with some researchers proposing that one disorder may directly cause other disorders. In addition, there is some speculation, although no definitive proof, that there may be a hierarchy within comorbidity (Burke, Loeber, Lahey, & Rathouz, 2005). For example, the assertion is sometimes made that there is a primary problem and secondary problems, and, that if the primary problem is addressed, the symptoms of the secondary disorders will dissipate. The incomplete and contradictory evidence available to date has generated more questions than answers. For example, in a longitudinal study over the course of seven years with a sample of 168 clinic-referred boys, Lahey, Loeber, Burke, Rathouz, and McBurnett (2002) examined the relationship between various behavioural and emotional problems. They discovered that changes in the levels of CD predicted changes in the intensity of comorbid symptoms; for instance, depression
can develop after the onset of CD, and, if the symptoms of CD decreased, so did the incidence of depression (Lahey, Loeber, Burke, Rathouz, & McBurnett, 2002). Additionally, they noted that CD at one time predicted the development of comorbid conditions at a later time, but it did not predict any particular comorbid condition. Unfortunately, this particular study focused solely on boys, and, to date, no similar analysis has focused on girls. In contrast, researchers evaluating a treatment program designed to address depression found that the program was effective in reducing depression symptoms but had no impact on symptoms of CD in participants who were experiencing comorbid depression and CD (Rohde et al., 2004). Their findings suggest the need to intervene in a way that addresses each disorder separately and directly; practitioners must refrain from assuming that treatment that is effective for one disorder will be effective for another.

Children diagnosed with CD frequently experience comorbid conditions of ADHD, ODD, anxiety, mood, and learning disorders (Angold et al., 1999; Children’s Mental Health Ontario, 2001; Fergusson et al., 1996; Loeber & Keenan, 1994). According to Gordon Floyd, the executive director of Children’s Mental Health Ontario (CMHO), “one in five children in Ontario has a diagnosable mental health disorder which causes moderate to severe impairment—two-thirds of those children have more than one disorder” (Floyd, 2007, p. 3). Kazdin (1996), a renowned researcher in the field, noted that 70% of children referred to a prominent clinical and research centre that specializes in child behaviour problems present with more than one disorder. Similar to the data on conduct problems, gender commonalities and differences in the prevalence and severity of comorbid conditions exist. An important and consistent finding in the literature is that girls are less likely than boys to develop CD, but they are more likely than boys with CD to experience comorbid conditions if they are diagnosed with CD (Abram et al., 2003; Keenan et al., 1999; Loeber & Keenan, 1994; Odgers & Moretti, 2002).
A particularly important observation is the high rate of comorbidity among young people in juvenile custody both in Canada (Ulzen & Hamilton, 1998) and in the United States (Abram et al., 2003). In one Canadian study (Ulzen & Hamilton, 1998), researchers compared the rates of psychiatric comorbidity between an incarcerated sample and a community (nondelinquents) sample and found that 63.3% of incarcerated adolescents had comorbid conditions in comparison to 12% of the adolescent community sample. Of particular interest is that the majority of incarcerated adolescents with comorbid conditions had both externalizing and internalizing disorders and a greater proportion of incarcerated girls (81.8%) experienced comorbid disorders than incarcerated boys (57.9%; Ulzen & Hamilton, 1998). Depression in combination with ODD (87.5%) was most frequently present in the girls with comorbid disorders. In comparison, ODD and ADHD (67%) were most frequently present in the boys with comorbid disorders (Ulzen & Hamilton, 1998). The majority of community-based nondelinquent adolescents however were comorbid for internalizing disorders (Ulzen & Hamilton, 1998). Consistent with the Canadian study, in a study of youth in a large urban juvenile detention centre in the United States Abram et al. (2003) identified significantly more girls (57%) as experiencing comorbid disorders than boys (46%). Further examination of those with comorbid disorders in the American sample revealed that 48% of girls (42% of boys) experienced two or more of these problems: affective disorder, anxiety disorder, substance abuse, and ADHD or other disruptive behavioural disorders. In this sample, girls were also more likely than boys to experience simultaneously three or more of the aforementioned disorders (Abram et al., 2003). The high rate of comorbidity among incarcerated youth indicates both the seriousness of the comorbid diagnosis and the urgent need to respond to the needs of these children in order to prevent further negative outcomes (Abram et al., 2003; Ulzen & Hamilton, 1998). Additionally, these studies point to the importance of early identification and intervention.
with children and their families to help reduce the likelihood of involvement with the criminal justice system in adolescence.

The long-term prognostic trajectories for children diagnosed with CD, alone or in combination with other disorders, are costly to both the children and society (Angold et al., 1999; Bardone et al., 1998; Cohen, 1998; Fombonne et al., 2001; Knapp, McCrone, Fombonne, Beecham, & Wostear, 2002; Lahey, Loeber, Burke, & Rathouz, 2002; Loeber & Farrington, 2001; Marmorstein & Iacono, 2001; Scott, Knapp, Henderson, & Maughan, 2001; Simic & Fombonne, 2001). Children with comorbid disorders are known to have poorer outcomes than children with a single disorder. For example, the rate of self-harm among girls with comorbid CD and depression is higher than among girls who experience depression alone (Simic & Fombonne, 2001). Girls with both problems also engage in higher levels of risky behaviours such as substance abuse, have higher rates of adult criminality, and attempt suicide more often than girls with CD alone (Angold et al., 1999; Fombonne et al., 2001; Marmorstein & Iacono, 2001; Simic & Fombonne, 2001). Follow-up studies of women’s early adult lives indicate less favourable outcomes for women with a childhood history of comorbid CD and depression. For example, women with a history of childhood comorbid CD and depression exhibit more antisocial personality traits, depressive symptomology, and problems with global functioning than women with a childhood history of CD alone (Fombonne et al., 2001; Marmorstein & Iacono, 2001; Simic & Fombonne, 2001). The long-term consequences of comorbid conditions for the individual and the family highlight the need to understand how best to meet the needs of youth with comorbid behavioural disorders during childhood.

**Relevance for the Social Work Profession**

Children and their families seeking assistance at children’s mental health services often receive services from social workers. In Ontario, approximately one-third of social workers
work with children and their families directly in their capacity as clinicians in a variety of human services agencies (Ontario Association of Social Workers [OASW], 2006); therefore, research about behaviour problems is of great importance and relevance to professional social workers. Given the high likelihood that children referred to mental health services will be experiencing comorbid disorders, the lack of direction in the literature about effective strategies to address comorbidity is a serious problem (Floyd, 2007; Kazdin, 1996; Offord et al., 1989).

The purpose of the current research is to partially address this gap in the literature by examining the treatment response of a group of girls with childhood-onset behaviour problems who presented at intake with comorbid disorders to the Stop Now and Plan Girls Connection (SNAP® GC) program, a community-based program for young girls between the ages of 5 and 12 years with serious behaviour problems. By comparing the short- and long-term treatment progress of participants with comorbid externalizing and internalizing disorders with participants with only externalizing behaviour disorders, a preliminary understanding was gained of the additional treatment needs of participants with comorbid disorders, which can provide some direction to social workers and other practitioners who are providing, developing, and researching services for children with comorbid conditions. In addition, this study also addresses in part a second gap in the literature: the lack of clarity regarding risk factors for comorbid disorders. By comparing the risk factors present for the comorbid and noncomorbid groups of girls at intake, an initial risk summary (“picture”) for comorbid internalizing and externalizing disorders could help provide direction to social workers and other practitioners working in children’s mental health.

**Theoretical Framework**

Multiple theoretical explanations exist to inform how and why children develop CD (Granic & Patterson, 2006). The theories span micro and macro levels and draw from disciplines
such as criminology, psychology, sociology, and social work. Each theory illustrates a way to understand the development of CD in children, but each on its own does not explain fully childhood CD. Taken together, however, these theories can provide a more comprehensive understanding of childhood CD, especially when considered within an organizational framework that facilitates the linkages among these existing theories. Without a framework, we are left with a series of separate theories resulting in a fragmented understanding of CD with consequent faulty policy, prevention and intervention decisions, and initiatives. Therefore before discussing the many theoretical dimensions of childhood CD, it is important to identify a theoretical framework that will help to link each piece of the puzzle to others to develop a comprehensive understanding of this complex social problem. The ecological framework was chosen to be used in this study.

**Ecological Framework**

The most comprehensive framework through which to understand CD is the ecological framework (EF). It was selected as the theoretical framework for this study not only because it is the most comprehensive, but also because it is the most empirically supported.

The EF was first developed by Bronfenbrenner (Bronfenbrenner, 1979, 2005; Fraser, 1996; Germain & Gitterman, 1996; Miley, O’Melia, & DuBois, 1995; Stormshak & Dishion, 2002). Bronfenbrenner’s EF is based on Bell’s model of reciprocal influence between the child and environment (Bronfenbrenner, 1988). Here, the word *environment* refers to all levels of the individual’s surroundings and relationships, including those the individual interacts with directly (such as family members, peers, school, community centres/organizations) and indirectly (such as a parent’s work environment, government policy). Bronfenbrenner was one of the first researchers to put forward the premise that children are influential agents within the various
systems of their lives rather than passive receivers of influences from their environments (Stormshak & Dishion, 2002; Webb, 2003).

The EF is not a theory of development, like those proposed by Freud, Erikson, Piaget, or Kohlberg in their works on the stages of development (Cole & Cole, 1993); rather, it is a framework that “disentangles the various levels of influence on development” (Stormshak & Dishion, 2002, p.197). Bronfenbrenner’s work proposed that a person’s “ecological environment is conceived as a set of nested systems, each inside the next, like a set of Russian dolls” (Bronfenbrenner, 1979, p. 3). The uniqueness of Bronfenbrenner’s framework is its emphasis on the interconnections among settings. For example, Bronfenbrenner (1979) suggested that a child’s academic performance depends on a combination of the teaching techniques used, the relationship between the school and the child’s family, and the relationship between the school and community, rather than on only the effectiveness of the teaching style.

The EF provides a conceptual structure that allows one to develop and evaluate an understanding of the synergistic, reciprocal interactions between individuals and multiple aspects of their environment; in this case, interactions that contribute to the development of disruptive behaviour disorders. This understanding can then inform the development of prevention and intervention strategies (Henggeler & Sheidow, 2003; Moretti, Dasilva, & Holland, 2004; Moretti, Odgers, & Jackson, 2004). As the EF incorporates all levels of an individual’s environment, it is currently the most appropriate framework for social workers, given the social work profession’s fundamental assumption that people can only be understood adequately when considered within the context of their environment (Germain & Gitterman, 1987, 1996; Hick, 2006).

Not only does the EF provide a basis for understanding how the interactions between individuals and their environment may lead to problems, but it also provides a basis for
examining environmental and other conditions that promote children’s healthy development. Healthy development refers to the physical, emotional, mental, cognitive, and social development of a child (Centre of Knowledge on Healthy Child Development, 2009). The SNAP® GC program targets both the development of positive and socially appropriate values, skills, attitudes and behaviours and the reduction of problematic behaviours and attitudes. The established priorities of the social work profession include the promotion of healthy development and social justice (Germain & Gitterman, 1996; Hick, 2006).

Social justice is defined for the purpose of this thesis as every resident of Canada having equal rights, opportunities, and responsibilities (Miley et al., 1995; Zastrow, 2000). Social injustices such as discrimination and poverty limit opportunities, and influence the social condition and social position experienced by an individual girl and her family; this in turn influences attitudes, behaviours, and choices (Miley et al., 1995). When children with CD and their families experience social injustices such as poverty and limited community resources, the opportunity for change is seriously hampered. Such social dynamics underline the necessity for using the EF to expand our understanding of factors that contribute to how problems develop and what may be done to solve them—across all levels of society.

The SNAP® GC program contributes to social justice for the girls in a number of ways. First and foremost it is a gender specific program. Secondly the importance of the mother-daughter relationship for girls with behaviour problems is recognized and the program specifically focuses on strengthening the mother-daughter relationship in all components of the program (Levene, 1997; Pepler et al., 2010; Walsh et al., 2002). In addition, family workers not only advocate on behalf of the girls and their families but they assist parents in developing their own skills to advocate on their daughters’ behalf.
Historically, most theories initially focused on one level of a child’s environment such as the individual, family or societal level. As the knowledge base developed over time, theories that focused on more than one level of a child’s environment began to emerge. More recently, theories and studies are accumulating that focus on how different levels of a child’s environment interact with each other. For example, research findings help us have a much clearer understanding of how parent and family conditions (such as family violence or parental depression) and the severity of children’s problems are linked to other structural conditions such as poverty. The theories that inform this study within the EF are discussed in the following sections. The theoretical explanations for behaviour problems in this discussion are more comprehensive than what was required to explain the theoretical framework used by the SNAP® GC intervention or the Bridging the Gender Gap data set. The data used to complete the analyses for this study was not as comprehensive as the variables identified in the literature. However, given the dual focus of this study, identifying risk factors and comparing treatment response among girls with and without comorbid disorders, a comprehensive review was completed to help develop an understanding of the interplay between risks at all levels within a girl’s environment and to identify what might be missing in current approaches. A diagram that summarizes the theories, risk and protective factors which play a role in each level of the girls’ environment is available in Appendix A.

**Micro- and Mezzo-Level Theories**

Theories that can assist us in understanding how child behaviour disorders and CD develop at the micro and mezzo levels include attachment theory (Bowlby, 1974), life-course persistent theory (Moffitt, 1993; Moffitt, Caspi, Dickson, Silva, & Stanton, 1996), early-starters theory (Patterson, Capaldi, & Bank, 1991), social learning theory (Bandura, 1977), coercion theory (Granic & Patterson, 2006), dynamic systems theory, cognitive-behavioural theory
(Beck, 1967, 1976), self-control theory (Gottfredson & Hirschi, 1990), differential association theory (Adler, Mueller, Laufer, & Grekul, 2009; Gabor, 2010), and the social development model (Catalano & Hawkins, 1996). Although not all of these theoretical explanations directly focus on the development of CD which is a specific diagnostic category they do focus on similar behaviours that are indicators for CD such as the development of aggression, antisocial attitudes, values and behaviours. Therefore, they can help provide an understanding of how behaviour disorders develop, how to prevent problems from occurring, and how to intervene when problems emerge.

**Attachment theory.** Given the importance of the various dyadic relationships that contribute to children’s development, attachment theory is of particular importance. Developed by Bowlby (1974), the theory identifies people’s need for emotional links with other humans as a fundamental drive within each individual (Bowlby, 1974; Moretti, DaSilva, et al., 2004). Bowlby’s (1974) attachment theory helps us to develop an understanding about why behavioural patterns emerge within relationships, and about the purposes these patterns serve for individuals (Bowlby, 1974). Bowlby’s (1974) theory acknowledges the interaction between individuals and their social contexts in a way that is consistent with a multilevel EF.

Attachment theory’s primary focus is on the type of attachment that children develop with their primary caregivers and the impact of this on their behaviour within the parent-child relationship. Bowlby (1974) noted that children who experienced repeated threats of abandonment by primary caregivers engaged in the most angry and problematic behaviours in comparison to other children. Some behavioural differences in relationships have been identified between genders and, given that aggression displayed by girls often occurs within the context of close relationships, attachment theory may be more important to the development of intervention strategies for girls than it is for boys (Ehrensaft, 2005; Moretti, DaSilva, et al.,
2004). For example, girls often use aggressive behaviour within relationships as a response to perceived rejection, and they might also use aggressive behaviour as a method to engage or incite someone into some type of interaction (Moretti, DaSilva, et al., 2004).

Although attachment theory does identify some of the underlying mechanisms that may contribute to violence within close relationships (Moretti, DaSilva, et al., 2004), it does not fully address the shifts in attachment that occur from the parent-child relationship to peer to intimate partner relationships during the life course. Attachment theory also does not fully explain all aggressive, antisocial behaviours associated with CD such as stealing from strangers (Moretti, DaSilva, et al., 2004). The theory can therefore make only a limited contribution to the understanding of the development of antisocial, aggressive behaviour, and of the most effective methods to prevent or intervene in such behaviour (Moretti, DaSilva, et al., 2004). Attachment theory’s greatest strength lies in the information it provides in relation to the development of interventions at the individual level, especially for girls. Interventions that help girls change their pattern of behaviour within important relationships—from coercive and mistrusting to positive and trusting— may be key for helping reduce aggressive behaviour in girls (Ehrensaft, 2005; Moretti, DaSilva, et al., 2004).

**Life-course and early-starters theories.** Moffitt’s (1993; Moffitt et al., 1996) life-course theory and Patterson’s (Patterson et al., 1991) early-starters theory provide insight about the group of children towards whom it might be best to direct scarce treatment and prevention resources (Krohn, Thornberry, Rivera, & Le Blanc, 2001; Loeber & Farrington, 2001). Both theories differentiate between children who are likely to engage in lifelong problematic behaviour and children who are likely to engage in problematic behaviour for a short period during adolescence (Krohn et al., 2001; Loeber & Farrington, 2001). The feature that distinguishes these two theories, other than their use of distinctive terminologies, is Moffitt’s
conclusion that life-course persistent offenders emerge from a reciprocal process involving children who display problematic behaviour that is caused by neuropsychological problems, in combination with parents who experience significant difficulties in coping effectively with that problematic behaviour (Moffitt, 1997; Moffitt, Lynam, & Silva, 1994; Rutter, Giller, & Hagell, 1998). For Patterson, coercive interactions between parent and child are the major contributing factor to the development of problematic behaviour (Krohn et al., 2001). We can take from these two theories that a combination of neuropsychological and environmental circumstances on the one hand, and experiences in relationships with parents on the other, have a large impact on a child’s behaviour.

Although Patterson and Moffitt had different explanations about the development of CD they did agree that there are two distinct groups of children with CD. Members of the first group are referred to as *early starters* by Patterson and as *life-course persistent offenders* by Moffitt. The two researchers agreed (and empirical evidence supports them) that the earlier a child develops CD, the more persistent and consistent the problematic behaviour will be over the course of that individual’s life (Patterson, Forgatch, Yoerger, & Stoolmiller, 1998; Tremblay et al., 1992; van der Valk, van den Oord, Verhulst, & Boomsma, 2003). In contrast, Patterson’s *late starters* and Moffitt’s *adolescence-limited group* engage in less serious and violent behaviours for a shorter duration, often during adolescence while youth are moving through the developmental process of becoming more independent from their parents (Krohn et al., 2001; Moffitt, 1997). In addition, contributing neuropsychological factors associated with the life-course persistent group—such as speech problems, hyperactivity, and impulsivity—are not present for most members of the late starters group (Krohn et al., 2001; Moffitt, 1997). In general those who are not early starters have more socially appropriate and acceptable established behaviours, and a peer group to whom they can return to relatively easily. Most late
starters are more likely to succeed academically in comparison to the early onset group, which allows later starters more opportunities and choices as they move from adolescence to adulthood (Krohn et al., 2001).

**Social learning theory.** Bandura’s (1977) social learning theory is heavily relied upon as a basis for both understanding the development of CD and the development of intervention responses (Vaillancourt & Hymel, 2004). Social learning theory suggests that children learn by watching other people (e.g., parents, peers, neighbours) and the media (e.g., TV, music videos, movies) and through differential reinforcement processes. If children see a parent (or a peer or TV hero) rewarded for acting aggressively, then they are likely to imitate the modeled behaviour. Of particular importance is the impact of repeated modelling. Witnessing one aggressive or antisocial act that successfully obtains a desired goal is unlikely to shape a person’s behaviour, but witnessing such behaviour repeatedly has been shown to influence a person’s behaviour (Gleitman, 1981).

Social learning incorporates principles of classical and operant conditioning and allows for indirect learning. It also acknowledges and allows for cognitions to influence behaviour (Bandura, 1977), unlike Pavlov’s classical conditioning theory (Gleitman, 1981), whereby people learn through the repeated association between two variables, and Skinner’s operant conditioning theory (Gleitman, 1981), whereby people learn through the rewards and consequences of behaviour. Bandura’s social learning theory, consistent with the EF, explains functioning as a continuous and reciprocal interaction between people and their environment (Bandura, 1977).

Social learning theory contributes two key understandings that many treatment programs use in treating CD. First, repeated modelling of prosocial behaviour that is reinforced can help change a child’s behaviour. Second, social learning theory acknowledges individuals’ self-
regulatory capacities, which explains how and why individuals can learn to change existing behaviour patterns (Bandura, 1977). Children can learn to stop and think about what their choices are in a situation. They can also learn how to perceive and interpret the actions of others differently to help reduce the likelihood of an aggressive response. In addition, children can set goals for themselves and learn how to adjust their behaviour in order to achieve a goal such as not hitting or yelling (Bandura, 1977). As children are positively reinforced for behavioural changes and become more adept at new behaviours, their sense of self-efficacy increases, which in turn increases the likelihood of successfully repeating the new behaviours in the future.

**Coercion theory.** In addition to social learning theory, coercion theory provides an important theoretical contribution to our understanding of CD. Developed by Patterson in the context of understanding childhood aggression, coercion theory is based on principles of both social learning and operant conditioning (Granic & Patterson, 2006; Patterson, 2002; Patterson, Dishion & Bank, 1984):

[It is a] model of the behavioural contingencies that explain how parents and children mutually “train” each other to behave in ways that increase the probability that children will develop aggressive behaviour problems and that parents’ control over these aversive behaviours will decrease. These interchanges are characterized by parental demands for compliance, the child’s refusal to comply and his or her escalating complaints, and finally the parent’s capitulation. Coercive interactions are the fundamental behavioural mechanisms by which aggression emerges and stabilizes over development (Granic & Patterson, 2006, p. 101).

Coercion theory, supported by empirical evidence (Patterson, 1982; Patterson, Reid & Dishion, 1992), forms the foundation for parent management training, which is the most empirically supported intervention for reducing CD behaviours in children (Farmer, Compton, Burns, & Robertson, 2002). Understanding the coercive cycle allows clinicians to teach parents strategies to disrupt and prevent the cycle from escalating. By disrupting and eventually extinguishing the coercive cycle parents can assist their child in making positive behaviour changes.
**Dynamic systems framework.** The dynamic systems (DS) framework is an integrative framework that relies on the same underlying theoretical systems approach as the EF (Granic & Patterson, 2006). The DS framework incorporates coercion theory while relying on systems theory to describe how patterns of behaviour emerge and are maintained beyond the dyadic relationship (Granic & Patterson, 2006). The DS framework presently fails to adequately incorporate mezzo levels (e.g., neighbourhood or school environment) and macro levels (e.g., cultural norms or social policy) into the explanation for CD, despite relying on the same underlying theoretical systems approach as the EF (Granic & Patterson, 2006).

**Cognitive-behavioural theory.** Cognitive-behavioural theory, which suggests that our behaviours are influenced by our perception and interpretation of situations (Beck, 1967), adds another important layer to the understanding of aggressive behaviour. Often children with CD incorrectly perceive and interpret situations around them; for example, they will interpret or perceive situations as threatening, and then react aggressively in response to the perceived threat (Dodge, 1980; Orobio de Castro, Veerman, Koops, Bosch, & Monshouwer, 2002). Together with social learning and coercion theories, cognitive-behavioural theory helps us to understand how behaviour develops and is maintained through various reinforcement mechanisms, and through repeated exposure and reinforcement of cognitive distortions. These three theories guide most of the established intervention programs that address children’s problematic behaviours. Parent management training incorporates cognitive-behavioural theories to help parents develop effective parenting strategies and skills (Stern & Azar, 1998). Social skills training with children which likewise incorporates cognitive-behavioural strategies, when coupled with parent management training, increases positive treatment gains (Kazdin, Siegel, & Bass, 1992; Webster-Stratton & Hammond, 1997).
Self-control theory. Poor consequential thinking and impulsivity may contribute to aggressive and antisocial behaviours. According to Gottfredson and Hirschi’s (1990) self-control theory, individuals with low levels of self-control tend to engage in impulsive, insensitive, and risky behaviours that may be described as antisocial. Gottfredson and Hirschi (1990) suggest that, because people’s levels of self-control remain static throughout their lives, individuals’ habitual engagement in antisocial behaviour is predicatable.

This theory does not address the reasons why some children with impulse control problems do not develop CD or engage in criminal behaviour as adults, nor does it explain why many who engage in antisocial behaviour during one period in their lives do not then repeat the behaviour during other periods (Krohn et al., 2001). However, the theory does help to identify self-regulation, a deficit area, that if addressed in treatment, may provide children with skills that can help them increase their self-control, resulting in a reduction of problematic behaviour.

In addition to a lack of self-regulation a lack of perspective-taking may make it difficult for children to understand the impact of their aggressive behaviour on others. Social skills training, which involves helping children learn how to communicate assertively and appropriately, is often included as an intervention strategy for children with CD (Kazdin et al., 1992; Walsh et al., 2002; Webster-Stratton, Reid, & Hammond, 2004). The use of social skills training as an intervention strategy on its own, however, has shown mixed results (Dishion, McCord, & Poulin, 1999; Dishion & Stormshak, 2007). The evidence for parent management-training and social skills training is reviewed in more detail in another section of this chapter (“Interventions for CD and Comorbid Disorders”).

Differential association theory. Sutherland’s (Adler et al., 2009; Gabor, 2010) differential association theory expands on the understanding that social learning theory provides about the development of antisocial behaviour. Sutherland asserted that crime is a behaviour
learned in the context of communication within relationships. That is, association with peers who support unlawful, criminal, and aggressive behaviour will more likely lead to unlawful and aggressive behaviours. Sutherland’s theory not only incorporates the principles of reinforcement (from behaviour theories) and the role played by cognitions (from social learning theory and cognitive-behaviour theory) but also recognizes the influential role of friends and family members on the development of antisocial behaviour. Differential association theory is used more in explanations of delinquency than conduct disorder given the stronger role peer groups have for adolescents in comparison to children.

**Social development model.** The social development framework relies heavily on self-control theory, differential association theory, and social learning theory (Catalano & Hawkins, 1996) to explain the development of CD. The model has a broad focus that acknowledges that children learn patterns of behaviour in a multitude of contexts—family, school, religion, and other community institutions. Its underlying assumption is that the bond individuals form with socializing units, such as their families and communities, creates the individual’s commitment to following established rules. The nature of a person’s behaviour, whether socially acceptable or antisocial, will depend directly on the predominant behaviours, values, and conduct supported by the persons with whom the individual has bonded (Catalano & Hawkins, 1996). For example, if children associate with other peers who support antisocial activities, then they will receive little if any approval from their peer group for prosocial behaviour. But when they engage in delinquent behaviour such as stealing, or some type of aggression towards another individual, they will receive encouragement and approval from antisocial peers (Rutter et al., 1998). The degree to which children can control their behaviour to conform to societal expectations is related to how strong a bond these children have to prosocial values or antisocial values and behaviour.
The social development model is used in prevention programs that focus on assisting youth in developing relationships with positive role models and peers to help prevent the development of antisocial and/or aggressive behaviour (August, Realmuto, Hektner, & Bloomquist, 2001; Hawkins, Catalano, Kosterman, Abbott, & Hill, 1999; Hawkins et al., 2007; Hawkins & Weis, 1985). The model provides another piece of the puzzle in understanding how aggressive and antisocial behaviour develops but it does not explain why some children who are surrounded by negative antisocial influences do not develop antisocial and aggressive behaviour. The social development model also does not address how social policies may contribute to the development of antisocial behaviour.

**Macro/Structural Theories**

The micro- and mezzo-level theories discussed above have contributed to the field and have informed treatment that helps to reduce problematic behaviours and improve the quality of life of many children and families. However, they have not provided much guidance about how to meet the needs of those who do not benefit from treatments based on the cognitive-behavioural, coercion and social learning theories that underpin many treatment programs. Families least likely to benefit from such treatments are those who experience greater adversity and severity of problems. For example, families with high internal cohesion scores are more likely to complete treatment, whereas families experiencing a high level of conflict are at a higher risk for treatment attrition (Armbruster & Fallon, 1994). Structural or macro-level issues such as poverty may affect the development and maintenance of problem behaviours and can interfere with treatment initiatives (Kazdin, 1996; Kazdin, Mazurick, & Siegel, 1994). Theories that focus on individual, family, and peer factors do not place enough focus or emphasis on the problematic social circumstances that contribute to the development and persistence of problematic behaviour. Structural and sociological theories about deviance can help to explain
the development of behaviour problems at a more macro level and, when paired with micro-level theories and facilitated by the principles of the EF, may help to create a more comprehensive understanding of behaviour disorders.

As seen above, psychological and social work theories focus on the development of CD in young children at the individual, peer, and family level. Most structural theories have emerged from the fields of criminology and sociology. These fields focus more on the development of antisocial and criminal behaviour of adolescents and adults at the societal level than on the development of CD in young children. The field of criminology seems to have fluctuated between the use of narrow explanations for antisocial behaviour and the adoption of comprehensive models that incorporate both individual and environmental characteristics (Bursik & Grasmick, 1996). Shoemaker (2000) noted that, despite 19th-century European studies that demonstrated correlations between antisocial behaviour and social conditions (such as population density, income, and education levels), individualistic explanations, which have prevailed in both the academic and public domains, have strongly influenced the direction of research into antisocial behaviour. However, Durkheim’s concept of *anomie* and Marx’s theory of conflict helped to provide theoretical explanations for the correlations observed in the earlier studies between social conditions and antisocial behaviour and further the sociological explanation of antisocial behaviour (Mooney, Knox, Schacht, & Nelson, 2004). Three groups of theories, social strain theories, structural-functionalist theories and conflict theories are next reviewed.

**Social strain theories.** Social strain theorists attempt to identify the social constructs that contribute to the development of antisocial behaviour, through examining the roles played by poverty, religion, culture, and neighbourhood (Rowe, 1986). Durkheim (Bynum & Thompson, 2007; Mooney et al., 2004) suggested that when a society experiences rapid change
in social conditions, the process of establishing and maintaining societal norms is interrupted, resulting in conflicting or partially understood norms that lead in turn to a state of anomie. When anomie becomes widespread, people engage in behaviours that are not generally acceptable to society, such as stealing. Children experiencing multiple changes in their social conditions may therefore experience a sense of disruption with their connection to behavioural norms. For example, a move from a middle-class neighbourhood and lifestyle to a disadvantaged neighbourhood with few resources, as a result of family breakup or job loss, may create a lack of connection with society. Relocation to a new neighbourhood may mean the loss of friends and place children at a higher risk to engage in riskier and antisocial behaviour. A premise within this theory is that children are basically “good”, and only become involved in antisocial behaviours when under undue pressure or stress (Bell, 1999).

On the other hand, Merton (Bynum & Thompson, 2007; Mooney et al., 2004) suggested that people experience anomie when, due to structural barriers, they are not able to achieve widely accepted and established social goals such as acquiring belongings and gaining employment through legitimate means (Bell, 1999). Merton suggested that once people reach a state of extreme frustration they will start to break the rules in order to achieve their goals. The fewer resources and means to accomplishing a goal, the more strain is experienced, and the higher the risk that antisocial behaviour will be used to achieve the desired goal (Bell, 1999). For example, a child under extreme stress who is unable to obtain a desired object (an iPod, for example) through legitimate means may resort to stealing or bullying in order to obtain it.

Social strain theorists’ solution to antisocial behaviour is to slow the rate of social change and to reinforce societal norms through legal sanctions and public education campaigns (Mooney et al., 2004). The feasibility of trying to slow the rate of social change in a democratic and capitalist society is extremely poor. The record shows that, despite public education
campaigns and social and legal penalties, there are those who continue to engage in antisocial behaviour (Bynum & Thompson, 2007; Mooney et al., 2004). Thus, these theories do not adequately account for the development and stable rates of antisocial behaviour, since it is evident that interventions such as the threat of incarceration do not usually deter antisocial behaviour.

Such theories provide some understanding about the structural contributors of antisocial behaviour but they do not explain why some individuals who experience structural disadvantages do not develop behaviour problems. These theories also do not recognize the complex interaction between factors at the individual and macro or system levels, which may contribute to the persistence of problematic behaviours (Herrenkohl, Hawkins, Chung, Hill, & Battin-Pearson, 2001).

**Structural-functionalist perspectives.** Structural-functionalist perspectives suggest that society is a system of reciprocating, interconnected parts that work in conjunction with each other. Thus, families, educational systems, health care systems, and political systems all have crucial functions in the creation and maintenance of a society (Mooney et al., 2004). Consistent with the EF, structural-functionalist perspectives highlight the interconnectedness of social, political and economic policies and conditions experienced by individuals, families and communities. These theories identify the important role societal systems and policies play in the development and maintenance of both health and problem conditions for individuals, families, and communities. Included in this perspective are social pathology and social disorganization theories. Social pathology theory suggests that social problems are a consequence of a social “illness”, which causes some people to stray from normative behaviours. Therefore, according to this theory, antisocial behaviour in some individuals is a result of inadequate socialization (Bynum & Thompson, 2007; Mooney et al., 2004). This explanation does not address or account
for the normative behaviour of some individuals who have not necessarily been taught to adhere to society’s standards. Social disorganization is said to occur when there is a rapid breakdown of relationships between people in the community and the institutions that create structure within communities such as families, churches, and schools. When these relationship bonds deteriorate, the sense of cohesion among members that often inhibits or discourages antisocial behaviour is reduced. This theory does not address the fact that even in the most disorganized or disconnected situations many individuals do not engage in antisocial behaviour (Bynum & Thompson, 2007; Mooney et al., 2004).

**Conflict perspectives.** Another cluster of sociological theories can be grouped in the conflict perspective category. This perspective depicts society as an entity that comprises conflicting groups who compete for resources and power, not as an amalgamation of interconnected groups that depend on each other to create a functioning community (Bynum & Thompson, 2007; Marx & Engels, 1848/1986; Mooney et al., 2004). Marx and Engels (1848/1986) suggested that antisocial behaviour stems from the social inequalities created by capitalism. Social inequalities create two main groups within society—those who have opportunity, wealth, power, and privilege, and those who do not. Poverty—that is, the absence of wealth, opportunity, power, and privilege—is considered to be the underlying cause of social problems such as delinquency. The solution to social problems such as crime thus lies in the elimination of inequality and the creation of a classless society (Mooney et al., 2004). Not all members of oppressed groups engage in antisocial behaviour however; therefore, this theory does not fully explain the development of antisocial behaviour. In addition, it is important to remember that privileged members of society do engage in antisocial behaviour, indicating again the limitations of this theory in explaining the development of antisocial behaviour. However, Marxist conflict theories do help provide an understanding of the impact that poverty,
oppression, and limited choices can have on people’s actions, perceptions, and interpretations of their world.

In contrast, neo-Marxist conflict theorists focus on conflicts that arise among groups due to differing values (Bynum & Thompson, 2007; Mooney et al., 2004). These theorists have suggested that social problems may not be the cause of conflict, but, rather, may be the result of how a conflict is expressed. For example, children who are members of the dominant culture may bully children who are members of religious minority groups or members of minority cultures due to a lack of understanding of their different traditions. As a consequence of this aggressive behaviour, serious tensions between cultural groups may develop, leading to aggressive behaviour within school and community environments. Neo-Marxists have suggested that social harmony can be achieved by creating opportunities for members of groups in conflict to develop an appreciation of differences and to achieve a resolution that is satisfactory to all (Mooney et al., 2004). Many schools engage in educating students about other cultures as one method of helping children to appreciate rather than fear differences (Levin & Riffel, 1994). Given that value conflicts among groups usually also involve power, the expectation that groups in conflict will come to the negotiating table as equals may be unrealistic. The notion that mutually acceptable resolutions to value conflicts can be readily negotiated is likewise often not grounded in social realities (Mooney et al., 2004).

**Risk and Protective Factors for CD**

Consistent with the ecological framework, research results indicate that risks and protective factors exist at all levels in a child’s environment. Researchers have identified multiple factors associated with the development of disruptive behaviour disorders. The operation of these factors underscores the complexity of disruptive behavioural problems. The presence of a singular risk factor in a child’s life is unlikely to cause the development of a
disruptive behaviour disorder; rather, it is the combination and interaction of several risk factors that contribute to the development of disruptive behaviour disorders, by creating a destructive, rather than a nurturing environment, within which the child interacts (Appleyard, Egeland, van Dulmen, & Sroufe, 2005; Rutter, 1990; Webster-Stratton & Taylor, 2001). Not all children who experience the complement of risk factors associated with CD will develop behaviour problems (Appleyard et al., 2005; Loeber & Farrington, 1998). The ability of children to resist developing disorders in the presence of adverse environmental conditions suggests the presence of intervening protective factors (Ungar, 2008). For example, despite the fact that immigrant children are three times more likely than Canadian-born children to be living in poverty, immigrant children have fewer behaviour problems compared to Canadian-born children (Armstrong, Beiser, Oxman-Martinez, & Rummens, 2005). Researchers have hypothesized that protective elements within a child’s environment operate as buffers for existing risk factors in the environment. In addition, the cultural lens through which children perceive and interpret their circumstances influences their actions. As an example, refugee children arriving in Canada may consider their circumstances differently than children born in Canada, resulting in different outcomes. In this way, the impact of the risk factors on the child’s development may be reduced (Catalano & Hawkins, 1996; Grizenko & Pawliuk, 1994; Grossman et al., 1992; Hoge, Andrews, & Leschied, 1996; Rogers, 2000).

Using data from the National Longitudinal Survey of Children and Youth (NLSCY), Ma (n.d.) investigated the correlates for behaviour and emotional problems among immigrant children. Ma concluded that the number of parents (single-parent households) and the gender (boys) of immigrant children were the strongest variables associated with behavioural and emotional problems among immigrant children. At the community level, Ma found that population size and density had a major effect on the development of emotional disorders in
immigrant children and socioeconomic conditions such as more affordable housing were positively correlated with higher rates of prosocial behaviour among immigrant children. The presence of social services also had a strong influence on prosocial behaviour of immigrant children (Ma, n.d.). Whether children develop behaviour disorders therefore rests on the interplay among risk and protective factors at all levels of their environment (Catalano & Hawkins, 1996; Grizenko & Pawliuk, 1994; Grossman et al., 1992; Hoge et al., 1996; Rogers, 2000; Rutter, 1990).

It is important to identify (a) factors that increase children’s risk of becoming involved in aggressive and antisocial behaviour and (b) factors that protect children from becoming involved in aggressive and antisocial behaviour at each level of their environment. The next section reviews the risk and protective factors for CD at all levels of a child’s ecology. Some of these risk factors are more proximal and others are more distal and operate through a mediating or moderating mechanism.

**Risk and Protective Factors**

**Individual risk and protective factors.** Individual risk factors for CD include: neurobiological processes; the presence of antisocial attitudes; a history of abuse, physical or sexual; neglect or trauma; out-of-home placements; developmental problems, such as speech problems, learning disabilities; oppositional defiant disorder (ODD); attention deficit hyperactivity disorder (ADHD); and poor academic performance (Augimeri, Koegl, Levene, & Webster, 2005; *DSM–IV–TR*, 2000; Farrington, 2002; Grizenko & Pawliuk, 1994; Henggeler & Sheidow, 2003; Hoffmann & Cerbone, 1999; Kiesner, Dishion, & Poulin, 2001; Levene et al., 2001; Morrison, Macdonald, & Leblanc, 2000; Patterson & Dishion, 1985; Reppucci, Fried, & Schmidt, 2002; Webster-Stratton & Taylor, 2001). Oppositional defiant disorder (ODD) is a
different disorder from CD and will not be explored in detail here.\textsuperscript{1} The two are related, however, and although ODD generally develops prior to CD, a diagnosis of ODD will not necessarily lead to a diagnosis of CD (Morrison et al., 2000).

Even when risk factors are present at the individual level, protective factors such as good coping skills, an ability to adapt to one’s environment, good school achievement, positive self-esteem, positive social skills, positive social orientation, effective use of leisure time, and intelligence, have been shown to reduce and/or prevent the likelihood of developing behaviour problems (Catalano & Hawkins, 1996; Grossman et al., 1992; Hawkins et al., 2007; Herrenkoh et al., 2003; Hoge et al., 1996; Reppucci et al., 2002; Tremblay & LeMarquand, 2001).

**Family risk and protective factors.** Family risk factors include: low-quality and inconsistent parental supervision and guidance; strained mother-daughter relationship; punitive parenting; young age of the mother; low socioeconomic status; parental psychopathology; antisocial values held by parents; parental criminal or antisocial conduct, including a substance abuse history; antisocial personality disorder; lack of an extended support network for the family; parental stress; maternal depression; marital problems; low parental education achievement; large family size; an antisocial sibling; the lack of a consistent caregiver; and/or a history of substance abuse by a mother when pregnant (Armstrong et al., 2005; Augimeri, Koegl, Webster, & Levene, 2001; Bloomquist & Schnell, 2002; *DSM–IV–TR*, 2000; Farrington, 2002; Henggeler & Sheidow, 2003; Laub & Sampson, 1988; Levene et al., 2001; Levene, Madsen, & Peper 2005; McMahon & Frick, 2005; Offord, 2001; Patterson & Dishion, 1985; Pogarsky, Lizotte, & Thornberry, 2003; Reppucci et al., 2002; Sprott, Doob, & Jenkins, 2001; Wasserman & Seracini, 2001; Webster-Stratton & Taylor, 2001). Of interest, mothers and

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\textsuperscript{1} It is mentioned here, however, since some girls who participated in the program and thus met the diagnostic criteria for CD also satisfied the diagnostic criteria for ODD.
teachers reported more externalizing and internalizing problems for children from families with either chronic family poverty or poverty in later childhood in comparison to families with no history of poverty or with a history of early or transient poverty (National Institute of Child Health, 2005). Consistent parental monitoring and discipline, family cohesion, warmth, and bonding during childhood are all associated with the absence of the development of CD (Grossman et al., 1992; Reppucci et al., 2002).

**Peer risk and protective factors.** Peer risk factors include peer rejection, strained peer relationships, victimization by peers, and the presence of strong negative peer influences that help to reinforce and shape antisocial attitudes and behaviours (Coie, Terry, Lenox, Lochman, & Hyman, 1995; Dishion et al., 1999; McGloin, 2009; Pepler & Sedighdeilami, 1998; Serbin, Marchessault, McAffer, Peters, & Schwartzman, 1993). Given the importance of relationships for girls, peer rejection is more predictive of behaviour problems in girls than in boys (Coie et al., 1995).

Young children entering the school system with aggressive behaviour habits are also likely to be aggressive in the school environment. Such aggressive behaviour often results in children being rejected by classmates who do not engage in aggressive behaviour whereas other aggressive children will accept and form friendships with them resulting in aggressive behaviour being reinforced and further entrenched. When children are rejected and victimized due to their problematic behaviour, they become isolated and have limited opportunities to interact with prosocial children. This in turn limits the ability of prosocial children to influence and encourage positive behaviour. For example, girls who reported that they themselves bullied others were likely to be rejected (21%) by their peers (Pepler, Craig, Yuile, & Connolly, 2004). When girls are rejected by prosocial peers they begin to seek out a peer group that will accept
them, which often consists of other marginalized children who engage in antisocial and aggressive behaviours (Caspi, Lynam, Moffitt, & Silva, 1993).

In contrast, the association with peers who do not support antisocial behaviours can act as a protective factor, as these peers encourage prosocial behaviours and provide both models and reinforcement of behaviours considered prosocial (McGlone, 2009; Warman & Cohen, 2000).

**Community risk and protective factors.** Community risk factors include: socioeconomic disadvantages, such as poor schools with limited resources and extracurricular activities; teachers who expect high rates of problematic behaviour; and high rates of criminal activity and violence within a child’s community, along with the presence of gangs (Coie & Miller-Johnson, 2001; Loeber & Farrington, 2001; Matsueda & Anderson, 1998; McMahon & Frick, 2005; Morrison et al., 2000; Reppucci et al., 2002).

The presence of external social supports such as cultural networks; churches or religious organizations that provide belief systems as guides to life; strong bonds to school; a positive relationship with a significant adult; and extended family members who reinforce an individual’s competencies and commitments all help to protect children and create a positive environment where they can flourish (Catalano & Hawkins, 1996; Grossman et al., 1992; Hawkins et al., 2007; Herrenkohl et al., 2001; Ungar, 2008). For example, the degree to which all adults (e.g., teachers or neighbours) in the community assume responsibility for the community’s children—through ensuring proper guidance and corrective feedback when a child misbehaves—is associated with lower incidence rates of behaviour disorders such as CD and ODD among African-American families (Simons, Simons, Conger, & Brody, 2004).

**Synergistic environmental interactions.** In addition to risk and protective factors existing at each level of the environment, evidence exists to support Bronfenbrenner’s position...
that a synergistic interaction among these levels in a person’s environment influences development. For example, findings from a study of 315 children in Grades 4 to 6, from three inner-city schools located in a midsize city in the United States, suggested that when stressful events and neighbourhood disadvantage are paired with higher levels of self-worth and family support, lower levels of antisocial behaviour were observed. When neighbourhood disadvantage and stressful events were paired with high levels of deviant peer support, however, high levels of antisocial behaviour were observed (Dubow, Edwards, & Ippolito, 1997). Hipwell et al. (2002) conducted a study of 2,451 girls between the ages of 5 and 8 who lived in Pittsburgh. A higher proportion from the sample of girls identified as having disruptive behaviour problems lived in disadvantaged neighbourhoods than in advantaged neighbourhoods (Hipwell et al., 2002). Another study using structural equation modelling indicated that families with high levels of conflict had lower levels of parent-child interactions, resulting in minimal parental monitoring and high rates of negative peer associates (Ary, Duncan, Duncan, & Hops, 1999), thus demonstrating once again the interactional effect that the different levels of an individual’s environment have on development and how they contribute to problematic situations. There is a strong association between negative peers and antisocial behavioural problems. Conflictual child-parent relationships leading to minimal parental monitoring are of great concern, given the established relationship between poor parental monitoring, antisocial peers, and the development of CD (Dishion, Nelson, & Bullock, 2004; Loeber & Dishion, 1983; Loeber & Stouthamer-Loeber, 1986).

**Gender-Specific Risk Factors**

Researchers have examined whether there are gender-specific risk factors for the development of disruptive behaviour disorders. Studies of the general population indicate that the same risk factors are associated with the development of CD in girls and boys (Odgers &
Moretti, 2002; Pepler & Sedighdeilami, 1998). When studies focused on clinical samples or young offenders several gender-specific risk factors emerged. For example, early sexual development, strained mother-daughter relationships (Levene et al., 2001; Yuile, Walsh, Pepler, Jiang, & Levene, 2006), disruptions in caregiving (Corrado, Odgers, & Cohen, 2000; Lee, Burkam, Zimiles, & Ladewski, 1994; Yuile et al., 2006), socioeconomic disadvantages, and marital conflict (Keenan, Stouthamer-Loeber, & Loeber, 2005) are associated with early-onset disruptive behaviour disorders in girls. In contrast, neighbourhood problems and parental substance abuse have been found to be risk factors for CD in boys but not in girls (Keenan et al., 2005).

One serious consequence of disruptive behaviour disorders is involvement with the criminal justice system. There is controversy in the literature about whether the risk factors for conflict with the law are the same for girls and boys (Antonishak, Reppucci, & Mulford, 2004; Odgers & Moretti, 2002). Once young people become involved in the criminal justice system, however their profiles and intervention needs differ significantly on the basis of gender. For example, girls involved in the justice system are more likely than boys to have a history of victimization, chaotic family lives, more mental health needs, and family members who have had contact with the criminal justice system (Antonishak, et al., 2004; Chamberlain & Moore, 2002). Gender differences in the rate of victimization may explain in part the higher comorbidity rates in girls as compared to boys within the incarcerated youth population. Corrado et al. (2000) examined the abuse history of 460 incarcerated Canadian youth and found that 70% of girls had experienced physical abuse in comparison to 38% of boys. Moretti and Odgers (2002) conducted a review of the literature and found that 45 to 75% of incarcerated girls had experienced sexual abuse. These findings suggest that girls who come in contact with the criminal justice system have experienced different or more severe conditions that have
interrupted healthy development than boys. As a consequence of harsher conditions, girls may require more comprehensive mental health services than boys, especially when they have been victimized (Antonishak et al., 2004; Chamberlain & Moore, 2002).

Risk Factors for Comorbid CD

The literature clearly documents the occurrence of comorbid disorders in children, but knowledge regarding the risk and protective factors associated with comorbid CD is less comprehensive than for singular disorders. Moffitt (1990) observed that children with comorbid attention deficit disorder and delinquent behaviour experienced more adversity at a young age in comparison to other disordered and nondisordered groups. Shaw et al., (2001) recruited low income families using a community program in a large city to study the risk factors for early externalizing behaviour problems. The sample for their longitudinal study included 310 male children aged 0 to 6 years. Maternal reports indicated that boys identified as having comorbid ADD and ODD or CD experienced the most chronic set of child, family, and neighbourhood risk factors in comparison to children with singular or no behavioural problems. Consistent with other research studies families with boys experiencing comorbid conditions were characterized as less caring, more disorganized and as having higher levels of parental rejection than families with boys experiencing either a singular condition or no problems (Shaw et al., 2001). Mothers of children with comorbid ADD and OD/CD experienced higher rates of depressive and aggressive personality symptoms, enjoyed less social support, and lived in dangerous neighbourhoods (Shaw et al., 2001). Ge et al., (1996) examined the relationship between parenting behaviour and the incidence of conduct problems and depressive symptoms in adolescents. Consistent with other studies, they found that the caregivers of adolescents with comorbid conditions exhibited the most hostile parenting behaviours in comparison to parents of adolescents with only conduct or only depressive symptoms (Ge et al., 1996).
Kim et al. (2003) conducted a longitudinal study using a community sample of African-American children and their families to examine the parenting-related factors for depression and conduct problems. They found that African-American children with comorbid conditions were more likely to have hostile, rejecting caregivers and disorganized home environments than children with either conduct disorder or depression, or no disorder at all (Kim et al., 2003).

Complicating our understanding of the risk factors for comorbid CD however is the fact that the factors considered to negatively affect a child’s environment and development are common to many disorders. For example, Fergusson et al. (1996) noted in their study that almost 70% of the cases of the shared incidence of CD and depression could be accounted for by the presence of risk factors common to both disorders. Illustrative, parenting processes such as inconsistent parenting, harsh discipline, and hostility toward children are associated with the development of CD (Patterson, 1982) and also with the development of depressive symptoms (Conger et al., 2002). Of interest, comorbid CD and depression are more likely to occur within preadolescent boys, whereas comorbid CD and depression are more likely to be detected in adolescent girls, suggesting that at different stages of life there is a differential gender risk for comorbid CD and depression (Zoccolillo, 1992). In addition, CD seems to precede depression in boys but in girls there appears to be a bidirectional relationship between CD and depression (Wiesner, 2003).

Another key piece to understanding why comorbid disorders develop draws us back to Bronfenbrenner’s (1979, 1988, 2001) conceptualization of the synergistic, reciprocal relationship that exists between children and the environment. If the reciprocal relationship between children and their environment creates the presence of one psychological disorder, then the children’s interaction with the environment is altered, most likely interfering with their developmental process. In addition, since children influence their environment it is likely that
the environment does not respond adaptively to a child who experiences problems. Furthermore, the absence (or presence) of only a few protective factors may further increase the development of multiple disorders.

The nature of the risk factors that may be associated specifically with the development of comorbid disorders is a research area that requires further elaboration. One of the aims of this study was to identify some of the factors associated with comorbid externalizing and internalizing behaviour disorders among young girls. With a fuller understanding of the developmental processes, agencies will be better able to equip themselves to develop and implement prevention and early intervention programs. For example, a clearer picture of the factors associated with comorbid externalizing and internalizing disorders could help inform preventative strategies and resources known to help protect children from these forms of adversity to be made available within communities for children and their families. The key to understanding the development of conduct disorder and comorbid disorders is the cumulative, synergistic effect of various combinations of risk and protective factors present in a child’s environment.

**Theoretical Summary**

The psychological literature’s predominant focus on the individual and family, or on the individual and peer, along with biological and psychosocial explanations, provides important contributions to the understanding of childhood behavioural disorders, but as we have seen, this focus fails to provide a complete understanding (Vaillancourt & Hymel, 2004). There is solid evidence for each of the risk and protective factors at the micro- and mezzo-levels of a child’s environment. In addition, there is strong evidence that treatments guided by theories from the micro-level—including cognitive-behavioural, social-learning, and coercion theories—are effective in treating disruptive behaviour disorders for children and families who complete
But high treatment attrition rates are noted (Armbruster & Kazdin, 1994; Kazdin, 1996; Wierzbicki & Pekarik, 1993) suggesting that these approaches do not meet the needs of many children and families dealing with childhood CD. In addition, some children—such as children with comorbid disorders—do not improve through the standard treatment and require more intensive, tailored support since they have additional needs (Walsh et al., 2002; Yuile, 2007).

Similarly, structural explanations, such as Marxist and neo-Marxist conflict theory, social pathology theory, social disorganization theory, and social strain theories also fail to address adequately the development of problematic behaviour (Bynum & Thompson, 2007; Mooney et al., 2004; Rowe, 1986). Although this group of theories provides some understanding about the structural causes of antisocial behaviour, they do not fully explain why some individuals who experience structural disadvantages do not develop behavioural problems. They also do not recognize the complex interactions among factors at the micro, mezzo and macro levels, for which evidence is accumulating, which may contribute to the persistence of problematic behaviours (Herrenkohl et al., 2001).

In conclusion, not one micro, mezzo or structural theoretical explanation for conduct problems and antisocial behaviour provides the required insights to develop adequate preventative measures and interventions. By utilizing the EF to incorporate multiple theoretical perspectives at all levels of children’s environment, however, a much richer understanding of CD emerges. The EF acknowledges society’s role in the creation of the less-than-desirable environments within which some children fail to thrive (Webb, 2003). Bronfenbrenner’s EF thus discourages the kind of linear thinking characterized by the assumption that a single triggering event will cause a predictable and possibly predetermined response by an individual (Germain
& Gitterman, 1996). Instead, the EF indicates the need to focus not only on changing children’s behaviors but also to focus on changing the behaviour of parents or other people within children’s microsystems, along with changing the surrounding environment.

This approach is closely aligned with the goals of the social work profession, which include helping resolve problems at the individual, family, community, and societal levels (Germain & Gitterman, 1996; Hick, 2006). Having said this, Bronfenbrenner’s EF is not a theory of intervention and does not describe how to alter the reciprocal relationships in a way that will create a more positive environment for children with CD. Rather, it is a conceptual framework that can help us understand the effects of synergistic interaction among different levels of a child’s environment. Having an understanding of how each of the different levels interacts with each other may then provide a guide for the types of interventions that can be used at each level to help make the desired changes.

**Interventions for CD and Comorbid Disorders**

Despite the gains in knowledge provided by studies conducted over the past 40 years, there remains a significant gap between research and practice. As most research studies relate to a single disorder and are conducted under ideal conditions—including adequate funding, small caseloads, clinical supervision, and a homogeneous client group—they provide little direction to clinicians working in real-world clinical practice settings which often involve a wider scope of focus, heterogeneous client population, underfunding, waiting lists, and limited clinical supervision due to strained resources (Doss & Weisz, 2006; Kazdin & Whitley, 2006; Stern, 2001). Of relevance for this study, most clinicians in real-world settings are required to provide services to children and families experiencing multiple concurrent problems (Garnefski & Diekstra, 1997; Kazdin & Whitley, 2006; Lewinsohn et al., 1995; Weisz, Donenberg, Han, & Weiss, 1995). Some researchers (Ollendick et al., 2008; Weisz et al., 2009) have challenged this
widely held, real-world viewpoint by demonstrating that many efficacy studies do use samples that match the complexity of real-world clinics. The difficulty is that most researchers have not explored the implications of comorbidity and treatment response (Ollendick et al., 2008). Given the prevalence of comorbidity, the lack of empirically tested interventions that might be effective in treating such conditions is a critical issue requiring attention.

Consistent with the EF theoretical framework and existing evidence on the development and maintenance of CD, the best interventions focus on multiple domains such as the individual, family, school, and community (Loeber & Farrington, 2001). Since children’s development is influenced by reciprocal relationships within their immediate and extended environment, it is important to assess and intervene in as many of the relevant dimensions of this world as possible (Fraser, 1996).

The literature has overwhelmingly focused on children and parents, which explains the extensive focus of attention on interventions intended to change the individual and/or parents. Studies of efficacy (i.e., whether a treatment is responsible for observed changes) and effectiveness (i.e., the degree to which it is possible to replicate and obtain similar outcomes achieved in efficacy studies within community-based settings) have focused primarily on interventions for parents and children based on cognitive-behavioural, coercion, and social learning theories. Such programs focus on assisting primary caregivers to develop parenting skills to manage their children’s behaviour more effectively and strengthen the parent-child relationship, thereby promoting an environment for healthy development.

The idea that parent management training programs are effective in reducing aggressive and antisocial behaviour among children may lead parents to feel judged or considered fully responsible for their child’s behaviour problems. An advantage of the application of the EF to understanding children’s development is that the approach reduces the intensity of the
judgments made about parents and increases the level of recognition of the responsibility shared by all members of society to create a positive environment that fosters the healthy development of all children. When parents understand that they are part of the solution, and that by learning parenting strategies they help their child, the feelings of judgment may be reduced.

Multiple investigators in many countries and settings have demonstrated the efficacy of parent management intervention programs in addressing childhood behaviour disorders (Bloomquist & Schnell, 2002; Kazdin & Wassell, 2000; Webster-Stratton & Hammond, 1997). Results of meta analysis studies further support reported positive results from individual studies regarding the efficacy of parent management intervention programs in addressing childhood behaviour disorders (Farmer et al., 2002). As well, effectiveness studies show promising results for parent management programs within clinic and health promotion settings (Pepler et al., 2010; Sharry, Guerin, Griffin, & Drumm, 2005; Stewart-Brown et al., 2004). Pepler et al. (2010) observed decreases in symptoms of externalizing behaviour problems and an improved quality in caregiver-child relationships in a children’s mental health agency with girls with externalizing behaviour problems. Sharry et al. (2005) observed significant reductions in conduct problems and decreased parental stress in a children’s mental health out-patient hospital clinic. Stewart-Brown et al. (2004) using a population sample of parents from a mixed demographic city also observed a significant reduction in child behaviour problems at the conclusion of treatment.

Evidence supports extending the intervention protocol to include not only parent management training but also social skills training for children. Social skills training on its own has been shown to be possibly effective for children but more treatment progress was observed when social skills interventions were coupled with parent management than when they were offered independently (Kazdin & Wassell, 2000; Webster-Stratton & Hammond, 1997; Webster-Stratton et al., 2004). Group-based social skills programs have had mixed results,
mostly in studies of adolescent boys, partly due to the negative influence antisocial peers can have on each other. This suggests the need to consider, despite the costs, individual skills-oriented counselling in lieu of group counselling for adolescents with CD (Dishion & Dodge, 2005; Dishion et al., 1999). As noted the majority of these studies focused mainly on adolescent boys; the results may not be applicable for preadolescent girls.

In addition, several models of family therapy show promising results for treating behaviour disorders (Comer & Fraser, 1998; Diamond & Josephson, 2005; Farmer et al., 2002; Hoagwood, 2005; Stern, 2004; Stern, Webber, & Augimeri, 2009; Wilson, Lipsey, & Derzon, 2003). Family therapy intervention models tend to focus on assisting families with adolescents struggling with antisocial behaviour whereas parent management programs focus primarily on pre-adolescents and young children.

**Gender-sensitive interventions.** The gender bias in childhood CD research programs emerges when examining the intervention literature with its focus on developing and reporting the efficacy and effectiveness of interventions for *boys*. When girls are included in intervention study samples, researchers either do not conduct a gender analysis, or they make minimal comparisons. As a consequence, clinicians receive little guidance about whether girls benefited from the treatment.

There is a serious danger in assuming that both genders in mixed-sex samples experience change at the same rate; as well, the reliance on statistical significance as an indicator of effectiveness may be misleading (e.g., Barkley et al., 2000; Eichler, 2004; Kazdin & Wassell, 2000; Webster-Stratton & Hammond, 1997; Webster-Stratton & Reid, 2003; Webster-Stratton et al., 2004). An encouraging sign is the development of gender-sensitive interventions such as the SNAP® GC program in Toronto, Ontario (Pepler et al., 2010; Walsh et al., 2002), and the psychoeducational group program located in London, Ontario (Cummings, Hoffman, &
Leschied, 2004). SNAP® GC, developed in 1996, is the first reported gender-sensitive program in North America for girls under the age of 12 with serious behaviour problems (Levene, 1997). It is based on a developmental-systemic model (Walsh et al., 2002), consistent with the EF, that suggests that development is influenced by the synergistic combination of risk and protective factors within the individual, her caregivers, and the community (Cairns & Cairns, 1991; Magnusson, 1988; Rutter, 1985, 1990). A fuller program description is available for the reader in Chapter 2. The program in London was an 8-session, structured, psychoeducational group for adolescent girls convicted of a crime. Two key goals of the program were to help girls examine the role and impact of violence in their lives, and to teach assertive coping strategies to deal with everyday stressful situations (Cummings et al., 2004). Initial effectiveness studies of these two programs create optimism that treatment may be effective for girls, and that attention is now being directed towards the needs of girls; unlike the current study, however, neither of these program has examined how comorbidity may influence treatment outcome.

**Comorbidity and intervention.** Despite the fact that issues related to comorbidity have been examined during the past two decades, and that the need for comorbidity to be given attention has been recognized, few resources have been directed to the creation and evaluation of treatment protocols to address the needs of children with comorbid disorders. When a retrospective program evaluation of the SNAP® GC program was conducted, the researchers noted that girls who remained clinical for externalizing problems at the end of the concurrent girls-and-parent SNAP® GC groups experienced comorbid conditions (Walsh et al, 2002). Yet, in a literature search for cognitive-behavioural interventions that address comorbid CD and depression in girls, only two studies were identified as attempting to address this combination of disorders.
One of these studies evaluated a treatment program for adolescents (Rohde et al., 2004), and the other evaluated an intervention with children under the age of 12 (Weiss et al., 2003). In a random control trial with a sample of 93 participants Rohde et al. (2004) evaluated the effectiveness of the Adolescent Coping With Depression course, an intervention designed to address depression in treating adolescent offenders who were comorbid for depression and CD. Participants were randomly assigned to either a treatment group or a life-skills comparison group. The researchers found that, although the intervention significantly reduced depressive symptomology at post-treatment, the intervention did not significantly influence the levels of CD. Externalizing behaviour symptoms were reduced for both the treatment group and the life-skills comparison group but these reductions were not considered statistically or clinically significant (Rhode et al., 2004). The research team consequently concluded that there was a need for interventions specifically designed to address comorbid conditions (Rohde et al., 2004).

In contrast, Weiss et al. (2003) designed an intervention, the Reaching Educators, Children and Parents (RECAP) program, that combined interventions proven effective in addressing both CD and depression individually. The RECAP program was a manualized, semistructured, psychosocial skills, school-based intervention of 9 months in duration. The program involved individual, group, classroom, teacher, and parent training. Weiss et al. (2003) evaluated the RECAP program using a prospective quasiexperimental research design with a sample of 93 families. Using mental health screening data collected by the school system researchers identified children with high levels (one standard deviation above the mean of their peers) of externalizing and internalizing symptoms to participate in the study. Pure random assignment was not possible due to the nature of the intervention. Part of the intervention was delivered in classrooms; therefore, control and treatment participants could not be in the same class (Weiss et al., 2003).
The researchers found a significant positive impact on both CD and depression symptoms for the treatment group. This outcome suggests it may indeed be feasible to address comorbidity in one intervention. The participants in Rohde et al.’s (2004) study were adolescents who had been convicted of a criminal offence, whereas the participants in Weiss et al.’s (2003) study were young, school-aged children suggesting that early intervention is vitally important; behaviour changes may be easier to make at a younger age.

Current study. At the Child Development Institute, located in Toronto, Ontario, in which the current study was situated, the results of a retrospective file review of the SNAP® GC program suggested that the program may be effective in reducing problematic behaviour. Still, girls with comorbid CD and depression displayed fewer positive gains from treatment than girls who presented with CD only (Walsh et al., 2002; Yuile, 2007). A subsequent 2-year, prospective, quasiexperimental evaluation of the SNAP® GC program, titled “Bridging the Gender Gap,” continued to indicate the program effectiveness for girls with CD but not necessarily for girls with comorbid conditions (Pepler et al., 2010; Yuile, 2007).

Guided by the EF framework and using data collected during the prospective evaluation, the goal of the current study was to explore the differences between ecological context and treatment progress in young girls with comorbid behaviour disorders and young girls with only externalizing behaviour disorders at several levels (individual, family, and neighbourhood). By comparing the previously unexplored differences between the two groups of girls, new knowledge of risk factors and their treatment response emerged. The results of this study provide some direction for assessment, program development, and future research initiatives and for clinicians working with children and their families. For purposes of this investigation, girls with comorbidity are identified as experiencing both externalizing (disruptive behaviours) and internalizing (depression and anxiety) behaviour problems within the clinical range on the Child
Behavior Checklist (CBCL; for a full description, see Chapter 3, Research Measures), which was completed by parents.

**Hypotheses**

This study’s hypotheses are as follows.

1. Girls who present with comorbid (internalizing and externalizing) disorders experience more ecological risk factors than girls who present with externalizing disorders only.

2. Girls who present with comorbid disorders at intake experience changes in behaviour more gradually during treatment and in the follow-up period than girls who do not present with comorbid disorders.

3. Participation in the SNAP® GC program reduces symptoms of comorbid disorders but does not fully address the clinical needs of girls with comorbid disorders as girls remain within the clinical range of comorbid disorders upon program completion.
CHAPTER 2

METHODOLOGY—BRIDGING THE GENDER GAP STUDY

The current study uses data from the Bridging the Gender Gap study (Pepler et al., 2010). It is important to review the strength of the methodology used in the original research in order to have confidence in the current study’s reliance on these data.

The Bridging the Gender Gap study, conducted by principal investigator Dr. Debra Pepler and Earlscourt Child and Family Centre’s staff, was designed to evaluate the effectiveness of the SNAP® GC program. In both years of this prospective, quasi-experimental study, girls were randomly assigned to a treatment group or a waiting list control group, with stratification for age and the severity of presenting problems (Pepler et al., 2010). Given ethical and clinical concerns, participants on the waiting list received or were offered the program following the conclusion of the treatment group’s program. Since the waiting list group received treatment immediately following the treatment group, it was not possible to compare the groups over time. It was possible to make comparisons before and after treatment, but at 6 months post-treatment they had all received treatment. Consequently, no comparisons between treatment and waiting list groups for the current study can be made beyond the immediate post-treatment phase of the Bridging the Gender Gap study.

Participants

There were no significant differences between the treatment and waiting list control groups for both years in any of the girls’ presenting problems, family demographics, or cognitive functioning (Pepler et al., 2010). The study sample consisted of 81 girls, 69 of whom

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1 Earlscourt Child and Family Centre merged with The Creche in 2004 to become the Child Development Institute.

2 The median score for externalizing behaviour problems was calculated and any girl scoring the median or higher was ranked as having severe problems and others as not severe. This was done to balance the risk/needs within each treatment group.
completed the SNAP® GC program.³ The girls who participated in the study ranged in age from 5 to 12 years, with a mean age of 8.6 years at the time of admission. To ensure an adequate sample size, referrals to the program were increased during the course of the study through a variety of presentations and advertisements. Most referrals originated from existing partners of the program, including schools, Children’s Aid Societies, and other social service agencies. Eighty-seven families agreed to participate in the research study of the 103 families who had met the clinical criteria for the SNAP® GC program over a period of 18 months. Of the 87 families, six withdrew from the study for a variety of reasons.

Procedures

When families contacted the Agency, the intake worker or a member of the SNAP® GC team conducted the Brief Child and Family Phone Interview (BCFPI; Cunningham, Pettingill, & Boyle, 2002) to ascertain if the families’ daughters, granddaughters, or foster daughters met the basic inclusion criteria (i.e., the girls were aged 5 to 12, exhibited externalizing behaviour problems, and lived in the catchment area). Upon completion of the BCFPI, the worker extended an invitation to girls who met the program’s criteria, along with their caregiver(s), for a full assessment. A score in the clinical range (70+) on the externalizing behaviour problem scale on the BCFPI was required to be eligible for the SNAP® GC program. A number of girls (n = 40) were excluded from the program and study as they either were outside the age range, had nonclinical levels of behaviour problems, or had a history of psychosis, intellectual deficits, or limited proficiency in English (Pepler et al., 2010). The family worker conducted separate semi-structured assessment interviews with the caregiver and girl, after which the research project was introduced to prospective families during treatment planning sessions. Voluntary,

³ The SNAP® GC program researchers established a rule that a family must attend a minimum of five sessions to be identified as having completed the program.
signed, informed consent to participate in the research study was obtained from caregivers, and assent from the girls. Families were made aware that participation or non-participation in the research study would not jeopardize their access to services. For those families who consented to participate in the study research measures were administered prior to and post participation in the concurrent girls’ and parents’ SNAP® GC groups. In addition measures were administered 6, 12 and 18 months after completion of the concurrent girls’ and parents’ SNAP® GC groups. Research measures were administered by agency staff (MSW, MA, BA) and practicum students (Ph.D., MA, and MSW students).

Measures

Data on family demographics and contextual data were collected from parents using a government mandated standardized instrument (BCFPI) and an agency-specific form (Family Information Form) at intake. Researchers administered a battery of standardized measures and questionnaires to assess the effectiveness of the SNAP® GC program from multiple viewpoints after the girls and their parents completed CDI’s intake process and were admitted to the program. These research measures were completed prior to treatment, at post-treatment, and then at 6, 12 and 18 months post treatment, to follow up and measure treatment progress.

The measures used by researchers focused on capturing data on the girls’ behaviour problems and social skills in home and school environments, the caregiver(s)’ parenting skills, and the quality of the mother-daughter relationship. The latter was included because a qualitative study previously conducted at the Earls-court Child and Family Centre, entitled Girls Growing up Angry (Levene et al., 2005), identified highly conflictual mother-daughter relationships as a particular area of concern. The SNAP® GC program focused on improving the quality of the mother-daughter relationship and investigators wanted to measure changes to it.
In the current study the data collected in the Bridging the Gender Gap research study was used to answer a different set of questions to further our knowledge of girls with CD. Please see Chapter 3 for a description of the current study’s variables and sources of data.

Program Description

The Child Development Institute (CDI), a children’s mental health agency that specializes in working with families with children who experience behavioural disorders, developed the SNAP® GC program (Levene, 1997). The program, developed in 1996, was the first reported gender-sensitive program in North America for girls under the age of 12 who had serious behaviour problems (Levene, 1997). Clinicians had observed that girls participating in co-ed treatment groups were not clinically benefiting from treatment (Walsh et al., 2002), which led the CDI clinicians to question the appropriateness of using a gender-neutral treatment approach and co-ed groups (Walsh et al., 2002). The developers combined the limited research information available at the time on girlhood aggression with the research on intervention with aggressive boys to develop their gender-specific program.

Researchers have repeatedly demonstrated the effectiveness of combining social skills training for children with a parent management skills program when addressing antisocial and aggressive behaviours in young children (Bloomquist & Schnell, 2002; Farmer et al., 2002; Kazdin & Wassell, 2000; Loeber & Farrington, 2001; Walsh et al., 2002; Webster-Stratton & Hammond, 1997). Thus, the SNAP® GC contains both child and parent components. Over time, SNAP® GC has evolved, through CDI’s scientist-practitioner model and commitment to incorporating emerging research findings from the literature (such as the importance of positive mother-daughter relationships in girls’ development trajectories) and results from agency evaluation studies into the treatment approach (Levene et al., 2005; Pakaslahti, Spoof, Asplund-Peltola, & Keltikangas-Järvinen, 1998; Pepler et al., 2010; Walsh et al, 2002). SNAP® GC’s
guiding theoretical framework is a developmental-systemic model (Walsh et al., 2002), consistent with the EF, which suggests that development is influenced by the synergistic combination of risk and protective factors within the individual, the caregivers, and the community (Cairns & Cairns, 1991; Magnusson, 1988; Rutter, 1985, 1990). The program was also informed by other key theories within the field including coercion theory (Patterson, 1982), attachment theory (Bowlby, 1974), cognitive-behavioural theory (Gleitman, 1981), and social learning theory (Bandura, 1977). These theoretical approaches highlight the difficulties—emotional and social information-processing challenges—often displayed by aggressive children, and the family processes that maintain aggressive and disruptive behaviour patterns.

SNAP® GC, a modification of the highly regarded SNAP® Under 12 Outreach Project (SNAP® ORP) for boys (Augimeri, Farrington, Koegl, & Day, 2007; Augimeri, Walsh, Liddon, & Dassinger, 2010; U.S. Department of Justice, Office of Juvenile Justice and Delinquency Prevention, n.d.), is a manualized, structured, and empirically based treatment program (Koegl, Augimeri, Ferrante, Walsh, & Slater, 2008; Levene et al., 2005; Walsh et al., 2002; Webster, Augimeri, & Koegl, 2002). A map of the program components is available in appendix B. The program consisted of three structured cognitive-behavioural intervention core components: two 12-session, concurrent, parents’ and girls’ groups, and one 8-session, mother-daughter relationship-building group designed to address factors that influence the development of girlhood aggression (Levene, 1997; Pepler et al., 2010; Pepler, Walsh & Levene, 2004; Walsh et al., 2002). In addition to these three core components, additional services such as educational tutoring, family counselling, individual befriending, school advocacy, and community linking or advocacy might be provided, depending on the needs and risk levels of the individual girl and her family, and based on the comprehensive needs and risk assessment completed during the
intake phase (Pepler et al., 2004; Walsh et al., 2002). Family workers also might assist isolated families develop a positive social support network within their community.

The current study focuses on the girls’ response to the concurrent girls’ and parents’ 12-session groups. These groups incorporated a variety of empirically based anger management strategies and skill-building techniques based on the Stop Now and Plan (SNAP®) anger management approach. Groups for both the parents and girls were co-facilitated by staff members including social workers (1MSW, 3 BSW), a child and youth worker, and one counsellor (BA- psychology). A peer mentor assisted co-facilitators in each of the groups. Peer mentors for the girls groups were graduates of the SNAP® GC program who demonstrated good skill acquisition, good leadership skills and were involved in the Leadership in Training component of the program. Peer mentors for the parents groups were graduates of the SNAP® GC parent group who demonstrated leadership and good communication skills and were experiencing stable family situations. The Clinical Director of CDI (MSW), Principal Investigator (Ph.D., Clinical Psychologist) and the SNAP® GC program coordinator (BSW) provided clinical supervision to the group facilitators.

The goal of the SNAP® GC is to reduce antisocial and aggressive behaviour by assisting girls in developing prosocial problem-solving and emotional regulation skills. As well, the program assists parents in advancing their problem-solving skills and parent management strategies (such as monitoring skills, reinforcement strategies for desired behaviour, and effective responses to inappropriate aggressive and rule-breaking behaviours; Pepler et al., 2004; Pepler et al., 2010; Walsh et al, 2002). By providing parents with an opportunity to develop effective parenting strategies, and to receive support, they could become better equipped to set limits on their daughters’ behaviours, reduce aggressive behaviours, and assist their daughters’ development of social skills. The program also focused on helping the girls and
parents generalize new skills across key life domains: individual behaviours, primary relationships (e.g., family, parent-child), and secondary relationships (e.g., peers, school, community; Pepler et al., 2010).

**Treatment Integrity**

Treatment integrity is a central component of program evaluation studies, since it ensures that the program was implemented as designed and that consistency across groups was maintained (McHugh, Murray, & Barlow, 2009; Moncher & Prinz, 1991; Perepletchikova, Treat, & Kazdin, 2007). In the SNAP® GC program, treatment integrity was maintained through the use of manuals, trained facilitators, clinical supervision, and integrity checklists complete by a researcher or clinical supervisor. Treatment integrity checklists were coded as consistently high across sessions and cohorts (Pepler et al., 2010).
CHAPTER 3

Methodology—Current Study

The current study examined the treatment intake profile and treatment progress of girls who presented with comorbid disorders in comparison to girls who presented with externalizing behaviour problems only.

Sample

The sample consisted of 81 girls between the ages of 5 and 12 years (at time of intake) and their parent(s), who met the intake criteria for the SNAP® GC program, which was a clinical rating on either the externalizing behaviour problems scale, conduct behaviour problems scale, or oppositional behavioural problems scale, as measured by the Brief Child and Family Phone Interview (BCFPI—see measures for a full description). Although small, the sample is adequate to test this study’s hypotheses. Of the 81 girls from the original study, 41 scored in the clinical range for both externalizing and internalizing disorders (comorbid group) and 40 girls scored in the clinical range for only externalizing disorders (non-comorbid group) as measured by the Child Behavior Checklist (CBCL—see measures for a full description) prior to treatment. The CBCL scales were used to determine comorbidity as this instrument was used at multiple time points (see Table 1) during the original study, allowing for monitoring change over time, whereas the BCFPI was only administered at intake for program suitability.

The mean age of the girls at intake was 8.49 years ($SD = 1.78$ years). Female single parents headed the majority (63%) of the families; 37% of families were two-parent families. Biological mothers were primary caregivers in 88.6% of the single-parent families; adoptive mothers, foster mothers, and stepmothers were primary caregivers in 5.1%; grandmothers were
primary caregivers in 3.8%; and fathers were primary caregivers in 2.5%. Of all the parents, 17.3% had less than a high school education, 23.5% had a high school education only, 29.6% had completed some community college or university, 12.3% had completed college, and 17.3% had completed university. Family income for 63% of families was below $30,000 per annum; 14.8% of families had an income between $30,000 and $39,000 per annum; and 22.2% of families had an income of $40,000 or more per annum. Almost one-third (27.2%) of parents scored in the range of moderate to severe concerns at Time 1 on the Beck Depression Inventory (BDI—see Research Measures for a full description) indicating depression may be an issue for these parents.

At the time of intake, 69.1% of girls had witnessed family violence on at least one occasion, 18.5% had experienced neglect, 11.1% had experienced physical abuse and 7.4% had experienced sexual abuse. Twenty percent of families lived in disadvantaged neighbourhoods characterized by poverty levels ranging from 26% to 73% (United Way of Greater Toronto, & The Canadian Council on Social Development, 2002, 2004; United Way of Greater Toronto, 2007).

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4 Time refers to pre-and post-concurrent girls’ and parents’ groups. At post 6, 12, and 18 months follow up some girls and their caregivers may have participated in the third program component (Girls Growing Up Healthy) and some of the adjunct services.
Ethics

This study’s protocol was submitted to and approved by the University of Toronto’s Research Ethics Board and by the Child Development Institute’s Research Ethics Committee. When caregivers provided written voluntary informed consent to participate in the Bridging the Gender Gap study they also provided voluntary informed consent to use the data collected for related program evaluation studies. Participation in this study was not expected to cause any harm or distress since no new data were collected; only data already provided by participants were analyzed.

Research Measures

Researchers during the original study collected intake, pre and, post the concurrent girls’ and parents’ SNAP® GC groups, and follow-up data using a variety of measures that spanned different levels of the girls’ ecology. Standardized questionnaires were used to collect information on parent criminality, parent history of substance abuse, family income, parent education, parent depression, history of abuse for child, history of witnessing family violence, child academic progress, and child’s history of mental health problems. Demographic information collected included families’ postal codes which were used to conduct an analysis of neighbourhood conditions, for example whether the postal code was located in a neighbourhood identified as disadvantaged by the City of Toronto and/or The United Way (United Way of Greater Toronto, and The Canadian Council on Social Development, 2002, 2004; United Way, 2007). A neighbourhood characterized by high poverty levels (26% or greater) was considered to be disadvantaged. Child coping skills were originally assessed using the clinician assessment tool, Early Assessment Risk List–21G (EARL-21G; Levene et al., 2001).

Data collected from each of the informants (parent or caregiver, child, and clinicians) are summarized in Table 2. Given the very small sample of male caregivers involved in completing
measures and/or participating in the parents’ groups a decision was made to use only data collected from female caregivers in order to prevent results being reported for groups consisting of fewer than five participants. The variables of interest for this study (demographic and contextual, child behaviour, parental depression, child academic progress and risk profile variables) along with the corresponding measures used to assess them are described in detail below.

Table 2

**Measures**

<table>
<thead>
<tr>
<th>Level and Variable</th>
<th>Measure</th>
<th>Intake</th>
<th>Pre</th>
<th>Post</th>
<th>Post 6 Months</th>
<th>Post 12 Months</th>
<th>Post 18 Months</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual—Child Conduct</td>
<td>BCFPI</td>
<td>P</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>CBCL</td>
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<td>P</td>
<td>P</td>
<td>P</td>
<td>P</td>
<td>P</td>
</tr>
<tr>
<td>Individual—Child Depression</td>
<td>CBCL</td>
<td></td>
<td>P</td>
<td>P</td>
<td>P</td>
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<tr>
<td></td>
<td>EARL 21-G</td>
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<td>FCW</td>
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<td>FCW</td>
<td>FCW</td>
<td>FCW</td>
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<tr>
<td>Individual—Academic Achievement</td>
<td>WRAT</td>
<td></td>
<td>C</td>
<td>C</td>
<td>C</td>
<td>C</td>
<td>C</td>
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<tr>
<td>Family Context</td>
<td>BCFPI</td>
<td>P</td>
<td></td>
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<tr>
<td></td>
<td>BDI</td>
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<td>P</td>
<td>P</td>
<td>P</td>
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<tr>
<td></td>
<td>EARL 21-G</td>
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<td>FCW</td>
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<tr>
<td>Neighbourhood Context</td>
<td>EARP 21-G</td>
<td></td>
<td>FCW</td>
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<td></td>
<td>BCFPI</td>
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<tr>
<td></td>
<td>United Way &amp; CCSD</td>
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<td>P</td>
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</table>

C = Child informant, P = Parent informant, FCW = Family Child Worker completed from information gleaned by the clinical team from multiple sources
CBCL—Child Behavior Checklist; BCFPI—Brief Child Family Phone Interview; WRAT—Wide Range Achievement Test-3; EARL-21G—Early Assessment Risk List 21G; BDI—Beck Depression Inventory; CCSD—Canadian Council on Social Development; *—data used from Poverty by Postal Code study (United Way of Greater Toronto & The Canadian Council on Social Development, 2004) to rank neighbourhoods as disadvantaged/advantaged.
Demographic and Contextual Variables

To test the first hypothesis that girls who present with comorbid disorders experience more environmental and individual risk factors than girls who present with externalizing disorders only, demographic information (family income, address) and family context information (abuse history, family violence, parental substance abuse, parental criminality, neighbourhood conditions) were retrieved from the BCFPI and EARL-21G data.

The BCFPI is a standardized, government-mandated, mental health screening and family profile telephone interview, designed for the caregivers of children between the ages of 3 and 18 years. The primary purpose of the BCFPI is to assist in identifying treatment needs. The BCFPI was developed using a community sample of 1,751 children and a clinical sample of 1,896 children in Ontario (Cunningham et al., 2002). The BCFPI has been found to have strong internal consistency, construct validity, concurrent validity, and reliability (Cunningham et al., 2002).

Postal codes were used to identify the neighbourhood where the family resided, which was then compared with reports on neighbourhood disadvantage in the City of Toronto (United Way of Greater Toronto, & The Canadian Council on Social Development, 2002, 2004; United Way, 2007). The United Way defined neighbourhoods with a poverty rate of 26 to 39.9% as having a high poverty level, and neighbourhoods with a 40% or greater poverty rate as having a very high poverty level (United Way of Greater Toronto, & The Canadian Council on Social Development, 2004). For purposes of the current study, a disadvantaged neighbourhood was defined as having a 26% or greater poverty rate. An advantaged neighbourhood was defined as having a poverty rate of 25.9% or lower.
Child Behaviour Variables

Data from the Child Behavior Checklist 4–18 (CBCL; Achenbach, 1991) were used to test the second hypothesis that girls who present at intake with comorbid disorders experience changes in behaviour more gradually than girls who do not present with comorbid disorders, by examining the changes in behaviour after treatment and during the follow-up between the two groups of girls. The CBCL is a 118-item, standardized, and widely used and accepted parent report instrument that records the frequency of child problem behaviours (Achenbach, 1991). The CBCL has a number of empirically derived subscales and two summary scales. The externalizing behaviour and internalizing behaviour summary scales were used in these analyses.

The reliability and validity of the CBCL are well documented by researchers (Ehrensaft et al., 2003). The test-retest reliability of the item scores on the CBCL has high intraclass correlations (0.90; Achenbach, 1991). Content validity was established on the basis that almost all CBCL items can significantly discriminate between children with and without problems. Construct validity was established by comparing scales on the CBCL to other existing scales such as Quay-Peterson’s Revised Behaviour Problem Checklist (Quay, 1977, 1983). Criterion-related validity was established by examining whether quantitative scale scores on the CBCL could discriminate between children with and without problems when controlling for demographics (Achenbach, 1991).

Parental Depression Variable

Parental depression, particularly maternal depression, is a known risk factor for the development of child behaviour disorders, because parental depression seriously affects parents’ ability to effectively parent their child (Herwig, Wirtz, & Bengel, 2004; Kaslow, Deering, & Racusin, 1994; Klein, Lewinsohn, Rohde, Seeley, & Durbin, 2002). The Beck Depression
Inventory (BDI; Beck, 1967) was used in the original study to assess the level of depression experienced by caregivers. This study used data from the BDI to determine whether there was a difference between the depression levels of caregivers of both groups of girls and the potential this variable had for predicting comorbidity (Hypothesis 1).

The BDI is a standardized, widely used and accepted 21-item self-report questionnaire that assesses cognitive, behavioural, and somatic symptoms of depression. The reliability and validity of the BDI have been demonstrated for both clinical and population samples (Shahar, Blatt, Zuroff, Kuperminc, & Leadbeater, 2004). This questionnaire has been shown to discriminate between depressed and nondepressed participants, to have high internal consistency (alpha = 0.92), to have test-retest stability, and to positively correlate for depression with other questionnaires, such as the Hamilton Psychiatric Rating Scale for Depression (Beck, Steer, & Brown, 1996).

**Child Academic Achievement Variable**

The only child informant measure used in this study was the Wide Range Achievement Test (WRAT-3; Wilkinson, 1993). Poor academic progress is a risk factor associated with children who experience disruptive behaviour problems. Data collected from the WRAT-3 (Wilkinson, 1993) provided information about school progress and allowed for a comparison at intake between the two groups to determine whether poorer academic achievement was present in the comorbid group as compared to the externalizing group (Hypothesis 1).

The WRAT-3 (Wilkinson, 1993) is a widely used screening test of academic achievement. It screens in three fundamental academic areas: spelling, word reading, and arithmetic with identical alpha coefficients ($\alpha = .98$). Strong evidence exists to support the content and construct validity of this measure (Hendry, 2003; Wilkinson, 1993).
Risk Profile Variables

For the purposes of this study, EARL-21G scores were used to compare and contrast the risk profiles of the two study groups. The EARL-21G provides an assessment of the risk factors associated with future antisocial behaviour for girls up to age 12 and is consistent with the research literature on girls with behaviour problems (Levene et al., 2001). It is still in its formative stages; however, it draws strongly from two similar instruments: the Early Assessment Risk List for Boys (EARL-20B; Augimeri et al., 2001) and the HCR-20 (Webster, Douglas, Eaves, & Hart, 1997) which have more formal validation data available. The EARL-21G can be used by clinicians to flag areas of concern that require intervention and by researchers wanting to conduct longitudinal or comparison studies of the profiles of girls.

During the Bridging the Gender Gap study, clinicians completed the EARL-21G using information gleaned by the clinical team from multiple sources prior to participation in the girls’ and parents’ SNAP GC groups, and at 6, 12, 18, and 24 months post-groups. The EARL-21G data file summarized the risk factors present at intake such as the girls’ academic progress, coping skills, and family environment, and was used in identifying whether certain risk factors were predictive of comorbidity when testing the first hypothesis.

When the EARL-21G was developed, some preliminary analyses were conducted regarding its reliability. Interrater reliability was found to have a mean positive Pearson correlation of 0.81 and intraclass correlation coefficients of 0.80 (single measure) and 0.96 (average measure) with all correlations being statistically significant (p < 0.01; Augimeri, Enebrink, Walsh, & Jiang, 2009; Levene et al., 2001). The predictive ability of the EARL-21G was examined by comparing the risk rating and court outcome data for a sample of 67 girls; results showed that 34% of girls labelled high risk by the EARL-21G had been found guilty in court of a criminal offence (Augimeri et al., 2009; Levene et al., 2001). This is a low predictive
power. There are two other problems with this particular finding: (a) since all children in the sample studied had received treatment, the predictive ability of the EARL-21G for untreated girls remains unknown; and (b) since it is established in the literature that there are numerous consequences of childhood behaviour problems other than criminal history this finding is quite limited. However, these problems do not interfere with how this instrument was used in the present study as it simply identified the presence of risk factors.

### Data Analysis Procedures

Logistic regression, multivariate analysis of variance, hierarchical linear modeling, and effect sizes along with numbers needed to treat and risk reduction scores were used to test the research hypotheses. Principal component analysis was conducted to reduce variables to a manageable number to facilitate the logistic regression analysis to test hypothesis 1.

### Procedure for Hypothesis 1

**Hypothesis 1**

Girls who present with comorbid (internalizing and externalizing) disorders experience more ecological risk factors than girls who present with externalizing disorders only.

In keeping with the EF, the variables selected to test this hypothesis represented several domains of the girls’ environment. These were: individual (developmental problems, history of abuse, history of witnessing family violence, hyperactivity, academic progress, child coping ability, school functioning, child antisocial attitudes and behaviour, and sexual development); peer (peer group, and child likeability); family (caregiver continuity, caregiver-child relationship, family stressors, parental depression, parental criminality, parental history of substance abuse, parental education achievement, and family income); and community (neighbourhood conditions, and family supports) domains. These variables are drawn from the measures used in the original study during intake (BCFPI and EARL 21G) and from the BDI administered at Time 1, pre-groups.
**Principal component analysis.** To prepare for the logistic regression analysis that tested the first hypothesis, principal component analysis was first performed to reduce the independent variables to a manageable set of components. These components were then used to explore the predictors of comorbidity in the subsequent logistic regression. As is the usual experience when conducting research, not all participants completed all measures at all time points; Table 3 indicates the number of participants with complete data at each time point.

<table>
<thead>
<tr>
<th>Time</th>
<th>Complete Data Available</th>
<th>Missing Data</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intake</td>
<td>81</td>
<td>0</td>
</tr>
<tr>
<td>Time 1</td>
<td>79</td>
<td>2</td>
</tr>
<tr>
<td>Time 2</td>
<td>69</td>
<td>12</td>
</tr>
<tr>
<td>Time 3</td>
<td>61</td>
<td>20</td>
</tr>
<tr>
<td>Time 4</td>
<td>56</td>
<td>25</td>
</tr>
<tr>
<td>Time 5</td>
<td>49</td>
<td>32</td>
</tr>
</tbody>
</table>

Note. \(^1\) Some or all data were missing at each point in time.

Missing data were dealt with by the imputation method; in this method, the variable mean is inserted when the value is missing (Little & Rubin, 1989). Given the small sample size, replacing the missing value with the mean was seen as the optimal choice rather than reducing the sample size further. The median externalizing Time 1 (pre-concurrent girls’ and parents’ SNAP® GC groups) scores for girls with missing data (Median = 71) were compared to the median externalizing Time 1 scores for girls without missing data (Median= 71) indicating no significant difference between these two groups at Time 1. Likewise the Time 1 externalizing score means were compared between the group with no missing data (\(\bar{x} = 70.2\)) and the group with missing data (\(\bar{x} = 71\)) again indicating no significant differences between these groups at Time 1. Therefore, the decision was made to insert the variable mean when a value was missing. Prior to performing the principal component analysis, the data were examined to ensure the
conditions necessary for the analysis had been met. As statistically required for this analysis there was a relationship among the variables, as they were attributes or experiences of the girls or their family. The sample size ($N = 81$) was adequate for this analysis and the number of variables was not greater than the number of participants (Leech, Barrett, & Morgan, 2005). The independent sampling requirement was met and the variables were correlated with each other at a moderate level. Bartlett’s test of sphericity was significant ($p < .05$), indicating that the correlation matrix was significantly different from an identity matrix (a square matrix whose elements consist of 1s on the diagonal and 0s elsewhere; Kutner, Nachtsheim, & Neter, 2004). The Kaiser-Meyer-Olkin measure of sampling adequacy measures the common variance among the variables. Results indicated a modest (.63) degree of common variance was present, indicating that the factors derived from this model accounted for a modest amount of the variance (Dziuban & Shirkey, 1974). Principal component factor analysis with varimax rotation was conducted, to reproduce all of the variance and covariance information associated with the identified variables that potentially predicted the presence of comorbidity in as few variables as possible.

The computer first generated a list of 11 components with an eigenvalue greater than 1, which explained 70.74% of the variance. When examining the components, they did not logically group together based on existing literature; therefore the analysis was repeated by fixing the number of components to be generated (Leech et al., 2005). Variables (parental BDI score, age of onset of behavioural problems, parental drinking, and parenting style) were removed at each stage of the process if they did not load into any of the principal components. As a result of this analysis, the most theoretically sound configuration consisted of five principal components that accounted for 50.43% of the variance. Although the fewer components reduced the variance explained, the components were logically, theoretically, and empirically sound and
in line with the literature. After rotation the first factor accounted for 11.77% of the variance, the second factor accounted for 11.62%, the third factor for 9.91%, the fourth factor for 9.59%, and the fifth factor for 7.67% of the variance. Table 4 displays the items and factor loadings for the rotated factors, with loadings less than .4 omitted to improve clarity. The first factor loads most strongly on the first nine items, which are related to the child’s personal characteristics; therefore this component is referred to as child characteristics. The second factor loads most strongly on the next eight items, which are related to the contextual environment of the family; therefore, this component is referred to as family context. The third factor loads most strongly on the next three items, which are related to the child’s academic achievement; therefore, this component is referred to as academic achievement. The fourth factor loads most strongly on the next five items, which are related to family circumstances such as income, standard of living, number of parents, and neighbourhood conditions and is, therefore, named family circumstances. The fifth factor loads most strongly on the final three items, which are related to abuse and therefore is named abuse.

Of interest in Table 4, the components consist of variables from one or sometimes two measures, which is logical since the purpose of these measures is to develop an overall assessment of the child and family circumstances. One exception is how abuse/trauma from the EARL-21G does not correlate with data from the BCFPI. Upon initial examination this proved puzzling. However, the BCFPI is conducted over the phone and is the first contact the caregiver has with the agency; therefore, it is likely that sensitive information may go underreported due to fears and possible consequences associated with reporting such information. As well, the caregiver may not be aware of some abuse that may have occurred for a variety of reasons (e.g., interruptions to caregiving, nondisclosure by child). The EARL-21G is completed by the clinician after conducting interviews with caregiver(s) and the girl and possibly receiving
Table 4

*Factor Loadings for the Rotated Factors*

<table>
<thead>
<tr>
<th>Factors</th>
<th>Factor Loading 1</th>
<th>Factor Loading 2</th>
<th>Factor Loading 3</th>
<th>Factor Loading 4</th>
<th>Factor Loading 5</th>
<th>Total</th>
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<td>Peer Association</td>
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<tr>
<td>Developmental Problems</td>
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<td>Child Antisocial Attitudes</td>
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<tr>
<td>Hyperactivity</td>
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<tr>
<td>Coping Ability</td>
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<tr>
<td>Child Antisocial Behaviour</td>
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<tr>
<td>School Functioning</td>
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<td>Sexual Development</td>
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<td>Family Context</td>
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<tr>
<td>Abuse/Neglect/Trauma</td>
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<td>Caregiver Continuity</td>
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<tr>
<td>Family Stressors</td>
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<td>Family Member Antisocial Values and Conduct</td>
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<td>Witness Abuse</td>
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<td>Caregiver-Daughter Interaction</td>
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<td>Positive Family Supports</td>
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<td>Academic Achievement</td>
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<td>Raw Score for Reading</td>
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<tr>
<td>Raw Score for Spelling</td>
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<tr>
<td>Family Circumstances</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Family Household Circumstances</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>Neighbourhood</td>
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<tr>
<td>Single Parent</td>
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<tr>
<td>Disadvantaged Neighbourhood</td>
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</tr>
<tr>
<td>Abuse</td>
<td></td>
<td></td>
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<td></td>
<td></td>
</tr>
<tr>
<td>Sexual Abuse</td>
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<td></td>
<td></td>
<td></td>
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<tr>
<td>Neglect</td>
<td>.72</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physical Abuse</td>
<td>.62</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Percent of Variance</td>
<td>11.77</td>
<td>11.62</td>
<td>9.91</td>
<td>9.59</td>
<td>7.67</td>
<td>50.43</td>
</tr>
</tbody>
</table>

*Note.* Loadings < .40 are omitted. Source of Variables: 1 WRAT; 2 EARL-21G; 3 BCFPI; 4 United Way & Canadian Council on Social Development, 2004

information from collateral sources including other clinicians, agencies, and teachers. Therefore, there may be a difference in the clinicians’ rating from the initial information collected during the BCFPI because the EARL-21G rating is based on a richer understanding of the child’s
history. In addition, once a clinician has developed a helping relationship based on trust and understanding, caregivers may be more comfortable sharing extremely sensitive information with the clinician and agency, which again may also account for the difference. The regression coefficient for each of the five components was calculated and used in the logistic regression described below to answer the question of which variables predicted comorbidity at treatment onset.

Table 5 provides the means and standard deviations for each of the five components for both groups.

Table 5

*Means and Standard Deviations of Principal Components for Comorbid and Noncomorbid Groups*

<table>
<thead>
<tr>
<th></th>
<th>Comorbid</th>
<th>Noncomorbid</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Child Characteristics</td>
<td>0.22</td>
<td>0.89</td>
</tr>
<tr>
<td>Family Context</td>
<td>0.20</td>
<td>0.90</td>
</tr>
<tr>
<td>Academic Achievement</td>
<td>-0.16</td>
<td>0.99</td>
</tr>
<tr>
<td>Family Circumstances</td>
<td>0.55</td>
<td>1.07</td>
</tr>
<tr>
<td>Abuse</td>
<td>0.26</td>
<td>1.10</td>
</tr>
</tbody>
</table>

*Logistic regression analysis.* Logistic regression is the preferred method to predict categorical outcomes such as, in this instance, predicting comorbidity (Hosmer & Lemeshow, 2000). Prior to performing a logistic regression analysis, the data were examined to ensure that the necessary assumptions had been met. The outcome variable (comorbid/noncomorbid) was a dichotomous variable, which was independent and mutually exclusive. Missing data were dealt
with by imputation method, which involved entering the regression coefficient mean for each of the principal components (Little & Rubin, 1989). The sample size was adequate \( n = 81 \) for this analysis (Leech et al., 2005). The data were assessed for multicollinearity by examining the correlations of the independent variables and by examining the tolerance and variance inflation factors. Although five of the correlations were significant (parent drinking and parent BDI \(-.35, p = .002\) 2 tailed; child characteristics component and age of onset of behavioural problems \(.24, p = .03\) 2 tailed; child characteristics component and parenting style \(.22, p = .05\) 2 tailed; age of onset of behavioural problems and family context component \(.26, p = .02\), 2 tailed; and age of onset of behavioural problems and academic achievement \(-.24, p = .04\), 2 tailed), none of the correlations was considered strong enough to impact the analysis. In examining the tolerance statistic, none of the independent variables had a problematic tolerance statistic \((\leq .20)\) as each of the values were greater or equal to 0.8 (Leech et al., 2005). All of the variance inflation factors were equal or less than 1.3 which is well below the established problematic threshold of \( \geq 10 \) (Kutner et al., 2004). Therefore little evidence of multicollinearity was detected (Kutner et al., 2004; Leech et al., 2005). Given that this analysis was exploratory in nature and an existing model to test the data did not exist, a backwards-stepwise logistic regression was conducted to build the model. Backwards stepwise procedure begins with all variables in the model and then at each step removes the variables that are not significant from the model. Logistic regression was performed to assess whether the five components (child characteristics, family context, academic achievement, family circumstances, and abuse), along with variables that did not fit into a component during the principal component analysis (parental drinking, parental depression level, parenting style, and age of onset of behaviour problems), significantly predicted whether a girl was considered comorbid at pre-treatment. Both backward-stepwise and forward-stepwise analyses produced similar results, suggesting that parental depression, parental
alcohol consumption, parenting style, and onset of behaviour problems did not significantly contribute to the model; therefore, in keeping with the parsimony principle and in recognition of the small sample size, these variables were removed from the analysis.

**Multivariate analysis of variance (MANOVA).** A one-way MANOVA was also used to test Hypothesis 1. It was conducted to compare to the logistic regression analysis results. This analysis tested the hypothesis that the means for each of the five principal components were not the same for both groups (comorbid and noncomorbid). A one-way multivariate analysis of variance (MANOVA) was conducted to determine the effect of the five principal components (child characteristics, family context, academic achievement, family circumstances, abuse) on the two dependent variables (internalizing and externalizing scores) for the two groups (comorbid and noncomorbid). There are three assumptions that must be met to conduct a MANOVA (Green & Salkind, 2005). The distributions of dependent variables must be multivariately normally distributed for each group. There is no specific way to determine whether this assumption is met; however it is important to be cautious when interpreting \( p \) values when using small samples (Green & Salkind, 2005). The second assumption is that the variance across the dependent variables is the same. Box’s test of equality of covariance was not significant, \( F(1.059, 25094) = 1.06, p = .39 \), therefore this assumption was met. The third assumption, that variable scores for each participant are independent from each other, was met (Green & Salkind, 2005).

**Procedure for Hypothesis 2**

*Hypothesis 2*

Girls who present with comorbid disorders at intake experience changes in behaviour more gradually during treatment and in the follow-up period than girls who do not present with comorbid disorders.
Prior to the analysis, the data were examined for accuracy, missing values, and for possible violations of required assumptions for hierarchical linear modeling (HLM). As with previous analyses, missing values were dealt with using the imputation method, which involved inputting the mean of the variable whenever a missing value was detected (Little & Rubin, 1989). The frequency distribution of the sample on the externalizing scale of the CBCL at pre-treatment was statistically explored to establish the shape, range, central tendency, and standard deviation of the scores. This examination revealed no significant skew in the distribution.

Hierarchical linear modelling allows for the analysis of variables within a nested data structure. For example, in this study, measurement of change is nested within individuals, and the individuals are nested within groups (comorbid and noncomorbid). The level-1 variables (time) were at the within-participants level of measurement and the level-2 variables (group—comorbid or noncomorbid—and age) were at the between-groups level of measurement. HLM 6.06 software (Raudenbush, Bryk, & Congdon, 2008) was used to analyze the models.

A hierarchical linear model, a type of growth curve procedure, captured the variation in externalizing scores across participants and groups (comorbid and noncomorbid) at different time points (pre-concurrent girls’ and parents’ SNAP® GC groups, post-concurrent groups, 6 months, 12 months and 18 months post groups). In other words, hierarchical linear modeling was utilized to analyze the model where participants (level-1) were nested within groups (level-2). Of particular interest was the relationship between individual externalizing scores (outcome variable) and time (level-1 predictor) and group membership (level-2 group predictor). To better understand the groups the reader is referred to Table 6 which shows the means and standard deviations for the two groups across time. These means and standard deviations were used to compare the groups.
In addition, the association that age (level-2 predictor) had on the model was also investigated. A 3-phase model testing was implemented: the level-1 model examined the influence of time, the level 2 model examined both time (level-1 predictor) and group membership (level-2 predictor), and the level-3 model examined time (level-1 predictor), group and age (level-2 predictors). Given that variance existed at both levels of the model, predictors were individually added in order to examine the role of each variable.

**Repeated measures ANOVA.** A repeated measures analysis of variance (ANOVA) was also conducted to examine the pattern of change in internalizing scores for members of the comorbid group to gain a better understanding of the influence of treatment on internalizing symptoms. This analysis was used to examine the pattern of change in an attempt to isolate and identify more clearly how internalizing symptoms changed over time.

**Table 6**

*Means and Standard Deviations of CBCL Externalizing and Internalizing Scales for Comorbid and Noncomorbid Groups*

<table>
<thead>
<tr>
<th></th>
<th>Time 1</th>
<th></th>
<th>Time 2</th>
<th></th>
<th>Time 3</th>
<th></th>
<th>Time 4</th>
<th></th>
<th>Time 5</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
<td>M</td>
<td>SD</td>
</tr>
<tr>
<td>Comorbid group*</td>
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<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Externalizing</td>
<td>74.97</td>
<td>4.88</td>
<td>68.04</td>
<td>9.29</td>
<td>66.90</td>
<td>8.18</td>
<td>65.75</td>
<td>8.57</td>
<td>66.85</td>
<td>8.32</td>
</tr>
<tr>
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<td>7.24</td>
<td>66.06</td>
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<td>63.43</td>
<td>7.86</td>
<td>63.20</td>
<td>9.24</td>
<td>62.18</td>
<td>9.78</td>
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<tr>
<td>Noncomorbid group**</td>
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</tr>
<tr>
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<td>56.35</td>
<td>6.57</td>
<td>56.55</td>
<td>6.07</td>
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</tbody>
</table>

*Note.* *n* = 41; **n* = 40
Procedure for Hypothesis 3

**Hypothesis 3**

Participation in the SNAP® GC program reduces symptoms of comorbid disorders but does not fully address the clinical needs of girls with comorbid disorders, as girls remain within the clinical range of comorbid disorders upon program completion.

Historical and current practice in experimental studies is for researchers to test for statistically significant change between the treatment group and the control group. This tells whether the treatment group changed significantly but does not necessarily say how much they changed (Jacobson, Follette, & Revenstorf, 1984; Jacobson & Truax, 1991). In other words, with a large sample size a small impact may be significant and with a small sample a large impact may not be significant. Additionally, a significant statistical effect is based on the averaged results of a group and does little to inform about the variable responses to treatment (Jacobson et al., 1984; Jacobson & Trauax, 1991). Nor does a statistically significant result indicate the degree to which the quality of clients’ lives has improved as a result of participation in treatment. For example, girls at the beginning of treatment with very severe scores may experience a large reduction in their score at the end of treatment yet remain within the clinical range, continuing to experience symptoms that put them at risk for many of the documented consequences of conduct and comorbid disorders, despite the fact that statistical significance was found.

A common way to measure the impact of treatment is to look at the effect size (Jacobson et al., 1984; Jacobson & Trauax, 1991). Effect size is usually identified as small, medium, or large. The most common effect size statistic used is Cohen’s $d$. Effect size indicates the impact of treatment but also does not fully explain whether this effect is clinically significant (Jacobson & Trauax, 1991). A large effect size may still potentially be inadequate from a clinical significance perspective. For example, if there is little variability within the treatment group and
no measurable change in the control group, a large effect size can be achieved but there may be a minimal reduction in the problematic symptoms (Jacobson & Truax, 1991).

Although there is agreement that statistically significant findings are not necessarily clinically significant, controversy exists within the literature about what constitutes clinical significance and how to measure it (Follette & Callaghan, 2001; Jacobson et al., 1984; Jacobson & Truax, 1991; Sheldrick, Kendall, & Heimberg, 2001). Some researchers consider a 0.5 change in standard deviation to be clinically significant. This definition recognizes the gains made in treatment, even if the individual remains within the clinical range of symptoms.

Other researchers consider clinical significance to be movement from the clinical to below the clinical range on standardized measures (Jacobson & Truax, 1991). For the purpose of this study, this more stringent criteria of clinical significance was used to fully assess the treatment response for girls with comorbid disorders and inform program development in keeping with the scientist-practitioner model adopted by CDI. Clinical significance was therefore defined as a score lower than the clinical range cut-off score established for the CBCL (Achenbach, 1991). Therefore, to test Hypothesis 3 and to better evaluate clinical significance, several additional analyses were calculated beyond statistical significance, including effect size, absolute risk reduction (ARR) and numbers needed to treat (NNT). The ARR and NNT can help determine whether changes in behaviour from pre-concurrent girls’ and parents’ SNAP® GC groups to post-concurrent girls’ and parents’ SNAP® GC groups were clinically significant.

In order to test this hypothesis, data from the CBCL externalizing and internalizing scales at pre-concurrent girls’ and parents’ SNAP® GC groups and post-concurrent girls’ and parents’ SNAP® GC groups treatment were examined to determine whether the changes in comorbid symptoms reflected a shift from the clinical to the nonclinical range. The effect size along with the ARR and NNT were calculated for both the externalizing and internalizing scales
to determine the extent to which participating in treatment helped to reduce symptoms of comorbid disorders at post-concurrent girls’ and parents’ SNAP® GC groups. The ARR indicates the decrease in scores that is attributed to treatment by comparing change in scores with a control group (Gibbs, 2003; Sackett, Straus, Richardson, Rosenberg, & Haynes, 2004). Given that no pure control group was available, the noncomorbid group was used as the comparison group for the purposes of this calculation. The ARR was calculated by taking the number improved in treatment multiplied by 100 and divided by the number in treatment (risk reduction = # participants improved* 100/sample). The NNT indicates how many girls with comorbid disorders needed to be treated in order for one girl not to be comorbid at the end of treatment (Gibbs, 2003; Sackett et al., 2004). The NNT for the comorbid group was calculated by identifying the # of girls (n = 6) that were noncomorbid at post-concurrent girls’ and parents’ SNAP® GC groups multiplied by 100 and divided by sample (N = 81).
CHAPTER 4

RESULTS

Hypothesis 1: Risk Factors for Comorbidity

Girls who present with comorbid (internalizing and externalizing) disorders experience more ecological risk factors than girls who present with externalizing disorders only.

In examining the results from the backward stepwise logistic regression analysis, the five components (child characteristics, family context, academic achievement, family circumstances, and abuse), when considered together, significantly predicted whether or not a girl was in the comorbid group, \( \chi^2 = 16.69, \ df = 5, \ N = 81, \ p = .01 \). This model explains 24.8% of the variance in \( y \) showing a small to moderate relationship between the predictors (components) and the prediction (comorbidity) as established by Nagelkerke R Square calculation. The Hosmer and Lemeshow Test had a \( p \) value of .55; therefore this analysis supports rejecting the null hypothesis that there is no difference, suggesting that the model fits the data at an acceptable level and supports Hypothesis 1 of this study.

Two additional measurements that indicate the goodness of fit include examining the percentage of participants correctly classified as comorbid or noncomorbid by the model and the sensitivity and specificity of the model. In this analysis, the question was how well the predictors accurately identified the probability of a girl being comorbid at the pre-concurrent girls’ and parents’ SNAP® GC groups stage. The following results are known:

- 65.9% (27) of the girls were accurately predicted to be comorbid;
- 70% (28) of the girls were accurately predicted to be noncomorbid;
- 30% (12) of the girls were inaccurately predicted to be comorbid; and
- 34.1% (14) of the girls were inaccurately predicted to be noncomorbid.

In this model 67.9% were therefore correctly classified. The sensitivity (ability to correctly identify true positives) of the model is 65.9% and the specificity (ability to correctly
identify true negatives) of the model is 70%. This model is slightly more accurate at identifying true negatives than identifying true positives. Table 7 presents the odds ratios, which suggests that the odds of estimating correctly who is comorbid at pre-group improve by a factor of 1.9 ($\rho = .02$) if one knows the child’s abuse history, and by a factor of 1.7 ($\rho = .04$) if one knows child characteristics. In summary, Hypothesis 1 held together theoretically and the data supported rejecting the null hypothesis; the results provided modest support for Hypothesis 1.

Table 7

<table>
<thead>
<tr>
<th>Variable</th>
<th>$\beta$</th>
<th>SE</th>
<th>Odds Ratio</th>
<th>$p$</th>
<th>Confidence Interval</th>
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<th>Upper</th>
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</thead>
<tbody>
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<td>Child characteristics</td>
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<td>0.25</td>
<td>1.68</td>
<td>.04</td>
<td>1.03</td>
<td>2.76</td>
<td></td>
</tr>
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<td>Family context</td>
<td>0.49</td>
<td>0.26</td>
<td>1.64</td>
<td>.06</td>
<td>0.99</td>
<td>2.71</td>
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</tr>
<tr>
<td>Academic achievement</td>
<td>-0.37</td>
<td>0.25</td>
<td>0.70</td>
<td>.15</td>
<td>0.43</td>
<td>1.14</td>
<td></td>
</tr>
<tr>
<td>Family circumstances</td>
<td>0.10</td>
<td>0.26</td>
<td>1.11</td>
<td>.69</td>
<td>0.67</td>
<td>1.83</td>
<td></td>
</tr>
<tr>
<td>Abuse</td>
<td>0.64</td>
<td>0.27</td>
<td>1.90</td>
<td>.02</td>
<td>1.13</td>
<td>3.20</td>
<td></td>
</tr>
<tr>
<td>Constant</td>
<td>0.05</td>
<td>0.25</td>
<td>1.05</td>
<td>.85</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. * = 95% confidence interval

The results of the multivariate analysis of variance (MANOVA) were consistent with the results of the logistic regression analysis. Results from the MANOVA indicated a significant difference between the two groups on the dependent variables, Wilks’ $\Lambda = .81$, $F(5, 75) = 3.53$, $p = .01$; thus, the null hypothesis was rejected as there was evidence that there were differences between the two groups. The multivariate $\eta^2 = .19$ indicates that 19% of the multivariate variance of the dependent variables was associated with group membership. The variance accounted for in this analysis was less than in the logistic regression due to the more stringent manner in which variance is calculated during a MANOVA; however, the variance accounted for was similar to the logistic regression. Analyses of variances (ANOVA) on each of the principal components were conducted as follow-up tests to the MANOVA. Using the
Bonferroni method, each ANOVA was tested at the 0.01 significance level. Not one of the principal components was significant at the corrected level; however, consistency was noted with the logistic regression results. The abuse component approached significance, $F(1, 79) = 6.15, p = .015, \eta^2 = .07$, whereas the child characteristics component $F(1, 79) = 3.99, p = .05, \eta^2 = .05$, the family context component $F(1, 79) = 3.44, p = .07, \eta^2 = .04$, the academic achievement component $F(1, 79) = 2.06, p = .16, \eta^2 = .03$, and the family circumstances component $F(1, 79) = 0.25, p = .62, \eta^2 = .003$ were not significant. The required 2-stage process of the MANOVA analysis limits the ability to detect significant differences between groups in small sample sizes.

**Hypothesis 2: Differential Response to Treatment**

Girls who present with comorbid disorders at intake experience changes in behaviour more gradually during treatment and in the follow-up period than girls who do not present with comorbid disorders.

The HLM analysis conducted to test this hypothesis was conducted in three phases. Phase 1, which included time as a level-1 predictor, indicated an intragroup correlation coefficient of .71. Thus, 71.1% of the variance in externalizing scores was between groups (comorbid and noncomorbid) and 28.9% of the variance in externalizing scores was at the participant level. The regression coefficient relating time to participants’ externalizing scores was negative ($b = -1.15, p = .00$) indicating externalizing scores were significantly lower for participants in both groups over time. This finding is consistent with the Bridging the Gender Gap study findings, namely, that participation in the concurrent girls’ and parents’ SNAP® GC groups has a significant effect on externalizing scores and that change in externalizing scores continues over time (Pepler et al., 2010). The Phase 2 model included group membership (comorbid or noncomorbid) as the level-2 predictor variable. The regression coefficient relating group membership to externalizing scores was positive, $b = 8.1, p = .00$. Externalizing scores
were significantly higher for participants in the comorbid group. In addition, externalizing scores were significantly different across time between the two groups, \( b = -1.02, p = .00 \).

Contrary to Hypothesis 2, change for the comorbid group had a steeper rate of change than the noncomorbid group, rather than the more gradual rate of change predicted. Table 8 provides a summary of the results predicting externalizing scores for the first two phases of the model, clearly illustrating how externalizing scores over time decreased for each participant and how comorbidity may have influenced the scores. Table 8 also clearly illustrates that members of the comorbid group had significantly higher externalizing scores over time compared with the noncomorbid group of girls. Table 9 provides a summary of the final variance estimation for the first two phases of the model.

Table 8

Hierarchical Model Results for Externalizing Score and Group Membership Effects from Pre-Treatment to 18 Months Post-Treatment

<table>
<thead>
<tr>
<th>Fixed Effect</th>
<th>Coefficient</th>
<th>Standard Error</th>
<th>T-ratio</th>
<th>Df</th>
<th>( \rho )</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pre-Treatment</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept(^1)</td>
<td>66.82</td>
<td>1.31</td>
<td>46.84</td>
<td>79</td>
<td>0.00</td>
</tr>
<tr>
<td>Comorbid</td>
<td>8.10</td>
<td>1.82</td>
<td>4.42</td>
<td>79</td>
<td>0.00</td>
</tr>
<tr>
<td>Time</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Intercept</td>
<td>-0.64</td>
<td>0.20</td>
<td>-3.20</td>
<td>79</td>
<td>0.00</td>
</tr>
<tr>
<td>Comorbid</td>
<td>-1.02</td>
<td>0.31</td>
<td>-3.28</td>
<td>79</td>
<td>0.00</td>
</tr>
</tbody>
</table>

Note. \(^1\)Intercept = Time 1

Figure 1 provides a graph of the change rates for each participant and between the two groups (comorbid and noncomorbid). Figure 2 provides a graph of the two groups that demonstrates the significant difference in the rates of change across time across the groups. It also clearly shows that over time, even well after participation in the concurrent girls’ and parents’ SNAP® GC groups was completed, externalizing problems continued to decrease for
both groups. After completion of the girls’ and parents’ SNAP® GC groups in the original study, girls and families may have completed the third component (GGUH) and/or received individualized services (e.g., tutoring, school advocacy, family counselling) to address specific child and family needs, which could account for some of the continued decrease in externalizing scores observed in both groups.

Table 9

Hierarchical Model Results for Variance Components from Pre-Treatment to 18 Months Post-Treatment

<table>
<thead>
<tr>
<th>Random Effect</th>
<th>SD</th>
<th>Variance Component</th>
<th>df</th>
<th>$\chi^2$</th>
<th>$\rho$</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept$^1$</td>
<td>5.76</td>
<td>33.23</td>
<td>79</td>
<td>151.02</td>
<td>0.00</td>
</tr>
<tr>
<td>Time</td>
<td>0.19</td>
<td>79</td>
<td>79</td>
<td>79.84</td>
<td>0.43</td>
</tr>
<tr>
<td>Level—1E</td>
<td>4.44</td>
<td>19.67</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note. $^1$Intercept = Time 1

*Figure 1.* Change of externalizing symptoms over time for the participants.
A third phase of the model added age as a level-2 predictor. Although at first glance age was not related to Hypothesis 2, a decision was made to explore the possible role age may have on the results, given that gender is a risk factor for depression around the beginning of adolescence (Nolen-Hoeksema & Girgus, 1994). The regression coefficient relating age to participants’ externalizing scores was not significant, \( b = 0.19, \rho = .66 \), nor was the regression coefficient relating age to externalizing scores over time, \( b = 0.08, p = .71 \), suggesting that age was not associated with the results detected.

These analyses, while not supporting Hypothesis 2, provide important clinical information about the treatment needs of girls with comorbid disorders at admission to treatment and the rates of change for girls with and without comorbid problems. What these analyses did show was that there was a significant difference between the two groups both at onset of treatment and over time. Girls with comorbidity changed more and at a steeper rate than the noncomorbid group when comparing the two groups’ slopes of change for externalizing symptoms. This result is perhaps due to the fact there was greater room for change for girls in the comorbid group given their higher scores at pre-concurrent girls’ and parents’ SNAP® GC groups. Additionally, the comorbid group’s mean for both externalizing and internalizing symptoms was consistently higher across time (see Table 6). These results suggest that while positive changes did occur, the question remains of whether the girls’ clinical needs were fully met, leading to the third hypothesis and analyses.

An additional analysis was conducted to examine changes in internalizing scores over time for girls in the comorbid group. These results allow for a greater understanding of how comorbidity may influence the pattern of change, providing additional information for program development. A one-way, within-subjects ANOVA was conducted to examine the pattern of
change in internalizing symptoms for girls in the comorbid group with time as the factor and internalizing \( t \) scores as the dependent variable. Table 6 contains the means and standard deviations for internalizing. The results for the repeated measures ANOVA indicated a significant effect over time, Wilks’ \( \Lambda = .429 \), \( F(4, 37) = 12.3, p < .00 \), multivariate \( \eta^2 = .57 \).

![Graph showing rates of change in externalizing symptoms over time for the two groups.](image)

*Figure 2.* Rates of change in externalizing symptoms over time for the two groups.

Follow-up polynomial contrasts indicated a significant linear effect with means decreasing over time, \( F(1, 40) = 35.1, p < .00 \), partial \( \eta^2 = .47 \). Higher-order polynomial contrasts (quadratic and cubic) were significant. Of interest, there was little change in means from Time 3 to Time 5; therefore significant linear, quadratic, and cubic trends were due to changes from pre- to post-concurrent girls’ and parents’ SNAP® GC groups and from pre-groups to 6 months post-groups. Figure 3 provides a graph indicating the positive changes in internalizing symptoms over time for the comorbid group. As previously indicated, girls and their families received individualized follow-up services after completion of the concurrent girls’ and parents’ SNAP® GC groups in the original study. These additional services could account for some of the continued decrease in internalizing scores that stabilized at some point.
Hypothesis 3: Clinical Needs and Clinical Significance

Participation in the SNAP® GC program reduces symptoms of comorbid disorders but does not fully address the clinical needs of girls with comorbid disorders, as girls remain within the clinical range of comorbid disorders upon program completion.

The question of whether the reductions in externalizing and internalizing scores were clinically significant as well as statistically significant for both groups of girls logically followed after answering whether externalizing scores decreased differently between the two groups.

The effect size along with the confidence interval was calculated for change over time for both externalizing and internalizing scores using both the full sample \((N = 81)\) and the two groups (comorbid group \(n = 40\), noncomorbid group \(n = 41\)) (see Table 10).

Effect sizes according to Cohen (1988) were considered to be small when \(d \geq 0.2\), medium when \(d \geq 0.5\) and large when \(d \geq 0.8\). When using the full sample, a medium effect size, \(d = 0.46, \text{CI} [0.14, 0.76]\), was found for externalizing behaviours from pre- to post-concurrent girls’ and parents’ SNAP® GC groups. This finding suggested that treatment changed externalizing symptoms for both groups of girls as expected given prior research on the SNAP®
GC program. A small effect size, $d = 0.35$, CI [0.04, 0.66], was also found when using the full sample for internalizing behaviours.\(^6\)

When examining the differences between groups the comorbid group had a borderline large effect size, $d = 0.78$, CI [0.32, 1.23], for externalizing from pre- to post-concurrent girls’ and parents’ SNAP® GC groups whereas the noncomorbid group had a small effect size $d = 0.33$, CI [-0.10, 0.77]. A strong medium effect size for internalizing, $d = 0.72$, CI [0.26, 1.16], was found for the comorbid group from pre- to post-concurrent girls’ and parents’ SNAP® GC groups. These results are quite encouraging especially given the treatment was not specifically designed to address internalizing behaviour problems. Little change was anticipated for the noncomorbid group for internalizing behaviours given the low level of problems present at the beginning of treatment but for comparison purposes the effect size was calculated. A small effect size was found for the noncomorbid group, $d = 0.25$, CI [-0.19, 0.68], for internalizing behaviours between pre-and post-concurrent girls’ and parents’ SNAP® GC groups. Given that the confidence intervals at the 95% level include 0 for the noncomorbid group, there is a possibility that the true effect size could be 0 and the effect sizes calculated could be obtained due to chance. The sample size used to calculate the effect size for the noncomorbid group was small, which may account for this result. In an attempt to reduce the impact of the small sample size confidence intervals were calculated at the 90% level, however due to the similar results a decision was made to maintain the more stringent approach (95% CI).

\(^6\) While girls in the non-comorbid group did not score within the clinical range for internalizing disorders some symptoms for internalizing disorders were present, therefore, examining the effect size for internalizing symptoms for all of the participants was calculated.
Table 10

**Effect Size Over Time for Entire Sample, Comorbid and Noncomorbid Groups**

<table>
<thead>
<tr>
<th>Group</th>
<th>Time</th>
<th>Variable</th>
<th>Cohen’s D</th>
<th>Confidence Interval*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Lower</td>
<td>Upper</td>
</tr>
<tr>
<td>Full Sample</td>
<td>T1 – T2</td>
<td>Externalizing</td>
<td>0.46</td>
<td>0.14</td>
</tr>
<tr>
<td>Full Sample</td>
<td>T1 – T5</td>
<td>Externalizing</td>
<td>0.57</td>
<td>0.26</td>
</tr>
<tr>
<td>Full Sample</td>
<td>T1 – T2</td>
<td>Internalizing</td>
<td>0.35</td>
<td>0.04</td>
</tr>
<tr>
<td>Full Sample</td>
<td>T1 – T5</td>
<td>Internalizing</td>
<td>0.46</td>
<td>0.14</td>
</tr>
<tr>
<td>Comorbid</td>
<td>T1 – T2</td>
<td>Externalizing</td>
<td>0.78</td>
<td>0.32</td>
</tr>
<tr>
<td>Comorbid</td>
<td>T1 – T5</td>
<td>Externalizing</td>
<td>1.07</td>
<td>0.59</td>
</tr>
<tr>
<td>Comorbid</td>
<td>T1 – T2</td>
<td>Internalizing</td>
<td>0.72</td>
<td>0.26</td>
</tr>
<tr>
<td>Comorbid</td>
<td>T1 – T5</td>
<td>Internalizing</td>
<td>1.09</td>
<td>0.61</td>
</tr>
<tr>
<td>Noncomorbid</td>
<td>T1 – T2</td>
<td>Externalizing</td>
<td>0.33</td>
<td>-0.10</td>
</tr>
<tr>
<td>Noncomorbid</td>
<td>T1 – T5</td>
<td>Externalizing</td>
<td>0.26</td>
<td>-0.18</td>
</tr>
<tr>
<td>Noncomorbid</td>
<td>T1 – T2</td>
<td>Internalizing</td>
<td>0.25</td>
<td>-0.19</td>
</tr>
<tr>
<td>Noncomorbid</td>
<td>T1 – T5</td>
<td>Internalizing</td>
<td>-0.10</td>
<td>-0.53</td>
</tr>
</tbody>
</table>

*Note.* * = 95% confidence interval

Effect size indicated the impact of treatment but did not show whether this effect moved a girl from the clinical to nonclinical range of symptoms on the CBCL. A *t* score on the externalizing or internalizing scale greater or equal to 64 was considered to be in the clinical range. A *t* score on either of these scales between 60 and 63 was considered to be in the subclinical range and a score below 60 was considered to be in the normal range (Achenbach, 1991). The absolute risk reduction (ARR) calculation along with the numbers needed to treat (NNT) were next calculated to examine clinical significance. The ARR for externalizing was 18.52 for the entire sample and the NNT = 5, indicating that for every five girls who participated in the program there would be one who would no longer be considered to have externalizing behaviour problems in the clinical range at the conclusion of treatment. These results indicated a
modest return for the investment of treatment resources. The NNT for the comorbid group was 7.4, indicating that for every seven girls who participated in the program with comorbid externalizing and internalizing behaviour problems, one girl would no longer be considered to have externalizing and internalizing behaviour problems in the clinical range at the conclusion of treatment. This result does suggest that additional treatment resources are needed with this group of girls in order to reduce their symptoms to the nonclinical range.

To put these numbers in context, similar programs in the literature were reviewed. Only one study was found to have used NNT. In comparison with the above results, a research study examining the efficacy of the Incredible Years parent program for treating young children between the ages of 3 and 4 years who had comorbid externalizing disorders (conduct problems along with ADHD) had a NNT of 4.17 (Jones, Daley, Hutchings, Bywater, & Eames, 2007). The comparison between these two studies is less than perfect given the different age groups studied; the fact that Jones et al. (2007) were studying a form of homotypic comorbidity (two disorders within the same family of disorders, in this case externalizing disorders) whereas the current study is examining heterotypic comorbidity (two disorders from different families of disorders, in this case externalizing and internalizing); and given that the Incredible Years study included only a parenting group, whereas treatment in the Bridging the Gender Gap study included parent and child groups. Both studies used parent reports to calculate the reduction in behaviours.

In summary, Hypothesis 3 held together theoretically. When the results were examined, the null hypothesis was rejected and the results provided modest support for the hypothesis that participation in the SNAP® GC program reduces symptoms of comorbid problems but not to a clinically significant level. This is understandable given the complex needs of girls with
comorbid disorders and the fact the program was designed to address externalizing behaviour disorders and not comorbid externalizing and internalizing disorders.
CHAPTER 5

DISCUSSION

Bronfenbrenner’s ecological framework (EF; Bronfenbrenner 1979, 2005; Fraser, 1996; Germain & Gitterman, 1996; Miley et al., 1995; Stormshak & Dishion, 2002) provided the conceptual framework to guide this research because it incorporates all levels of an individual’s environment and thus has relevance to social workers who strive to understand people within the context of their environment (Germain & Gitterman 1987, 1996; Hick, 2006). On their own, neither micro- or mezzo-level theories nor macro-level theories can fully explain the development of disruptive behaviour disorders in children. However, when the reciprocal relationship among all levels of a child’s environment is considered, a fuller understanding of how disruptive behaviour disorders develop can emerge.

In this study, the selection of variables included in the analyses and the interpretation of the results were guided by the EF. The focus of this chapter includes: discussing the results and their potential implications; identifying future research directions; and acknowledging the study’s limitations.

This study focused on identifying risk factors for comorbid disorders (externalizing and internalizing) within a clinical sample of girls in addition to comparing the treatment response of girls with comorbid disorders and girls with externalizing problems only. The study also focused on trying to gain a better understanding of the comorbid group’s clinical needs that were not directly addressed by the core component (concurrent girls and parents group) of the SNAP® GC program, in an attempt to contribute to future program development, and research. Data collected during the Bridging the Gender Gap study were examined to test this study’s three hypotheses.
**Hypothesis 1: Risk Factors for Comorbidity**

Girls who present with comorbid (internalizing and externalizing) disorders experience more ecological risk factors than girls who present with externalizing disorders only.

A backwards logistic regression analysis confirmed the first hypothesis. Results of the logistic regression model supported rejecting the null hypothesis that there was no difference between the two groups of girls (comorbid and noncomorbid). The model used accurately classified 67.9% of participants as either comorbid or noncomorbid. Although the overall model with all five principal components was significant, only two components (child characteristics, \( p \leq .04 \), and abuse, \( p \leq .02 \)) of the five were significant predictors of comorbidity. Similarly results from the MANOVA analysis also indicated a significant difference between the two groups on the dependent variables, Wilks’ \( \Lambda = .81 \), \( F(5, 75) = 3.53, p = .01 \). In contrast not one of the principal components was significant during follow-up analyses, most likely due to the small sample size and the two-step procedure required in a MANOVA analysis that is not required in a logistical regression analysis.

The findings provide social workers and other helping professionals who work with girls and their families—including program developers, policy makers, and researchers—with a piece of the puzzle regarding the context in which comorbidity across spectrums (externalizing and internalizing) is more likely to develop.

**Child Characteristics Component**

The first component that predicted membership in the comorbid group was labelled child characteristics. The child characteristics component included nine variables – peer association, child likeability, developmental problems, child antisocial attitudes, hyperactivity, coping ability, child antisocial behaviour, school functioning and sexual development. The finding that the child characteristics component was a significant predictor of comorbidity is consistent with the literature. Several established and shared risk factors for externalizing and internalizing
behaviour disorders are contained within the child characteristics component including characteristics of irritability and difficulty at an early age (Keiley, Lofthouse, Bates, Dodge & Petit, 2003); negative attribution and attention biases (Bogels & Zigerman, 2000; Dodge, & Frame, 1982); and poorer coping and problem solving abilities (Calkins, Gill, & Wilford, 1999; Patterson, DeBaryshe, & Ramsey, 1989; Strauss, Frame, & Forehand, 1987). These established risk factors are consistent with two of the variables (child likeability, coping ability) present in the child characteristics component.

Variables within the child characteristics component intersect with several dimensions within the child’s context: child and primary caregiver, child and extended family, child and school, child and neighbourhood. For example, the child’s peer group along with the child’s likeability, school functioning, and coping ability could interact in a way that contributes to comorbidity although this was not possible to test in this study. Consistent with existing literature, children with comorbid disorders tend to be more irritable (Harrington, Fudge, Rutter, Pickles, & Hill, 1991). Consistent with the EF the more irritable the girl the less likeable she is to those around her, reducing the likelihood of positive interactions with others such as family members, peers, teachers and community members. Limited positive interactions with others within her environment may isolate her from positive peers, and increase the likelihood of associating with other children who are rejected and who may prove to be negative influences on the girl. Bronfenbrenner (1979, 1988, 2001, 2005) argued that mezzo- and macro-level variables contribute to micro-level factors, which may be the case for the child characteristics component as well. For example, school board policies that shape the environment within the girls’ schools may partially explain how the school’s staff responds to the irritable students within their context. For example, there may not be enough resources available to mentor the girl and reinforce prosocial interpersonal communication skills or punitive consequences may be
seen as the only available response for irritable behaviour. In addition, how girls’ caregivers respond to their daughters’ irritability is partially shaped by the environmental contexts that caregivers experience directly although their children do not—for example, the caregivers’ workplaces.

**Abuse Component**

The second component that predicted membership in the comorbid group was labelled abuse. Three variables—history of sexual abuse, neglect, and physical abuse—that make up this component similarly intersect with several levels of the girls’ context. These include the child-caregiver level, child-extended family level, child-neighbourhood level, and child-school environment, since the perpetrator of abuse experienced by a girl may be a caregiver, an extended family member, or a community member.

The finding that the abuse component is a significant predictor for comorbidity is consistent with the literature. Other studies have detected a higher rate of abuse among children with comorbid externalizing and internalizing disorders (Meller & Borchardt, 1996; Simic & Fombone, 2001). There is also an established link between comorbidity and harsher family situations (Ge et al., 1996; Kim et al., 2003; Shaw et al, 2001; Simic & Fombone, 2001) which may possibly include higher incidences of abuse.

How people within an abused girl’s environment respond to the abuse, together with her perception of their response, will also shape her behaviour. For example, how a trusted adult responds to a girl’s disclosure of abuse (or to observing it) contributes to the girl’s beliefs about her environment. If, for example, she tells a trusted adult that she has been abused and the adult disregards her report, she may perceive that it is acceptable for someone to abuse her; she may then not trust another adult enough to disclose what is happening to her, or she may perceive that no one is able to help her. The institutional response (e.g., police, child protection services)
to abuse that is reported will have an impact on an abused girl and possibly on her siblings; she and/or her siblings may be removed from their home and caregiver, for their own safety, and be placed with alternative caregivers who may be strangers. Out-of-home placements can require children to change schools, lose contact with friends, and have daily activities significantly disrupted. Interestingly, girls with behaviour disorders experience many more out-of-home placements than boys with disruptive behaviour disorders (Corrado et al., 2000). There is no evidence of a causal relationship but perhaps frequent disruptions in caregiving may help to contribute to the documented differences in comorbidity rates between girls and boys.

It is well documented in the literature that abuse has serious short- and long-term consequences for victims (Chartier, Walker, & Naimark, 2009; Corrado et al., 2000; Hildyard & Wolfe, 2002; Milot, Éthier, St-Laurent, & Provost, 2010). Consistent with existing research, the results of the current analysis therefore indicate the importance of collecting information regarding any history of abuse when completing assessments with girls who present with behaviour disorders as this may indicate a higher risk for comorbidity. (Conversely girls with comorbidity may be more likely to have experienced abuse because of the established relationship between harsher family environments, parenting styles and comorbidity.) The failure to collect such information presents risks—further ongoing abuse might not be detected, and/or clinical needs resulting from the abuse might be ignored or not fully addressed by treatment providers.

**Interpreting Overall Model Results**

At first glance the results could be interpreted to mean that the key predictors of comorbidity are within the child. However as illustrated, if the individual variables that make up the child characteristics and abuse components are closely examined (see Table 4), it may be seen that other variables at different levels could also be contributing to the development of
comorbidity. Exploring the interrelationships between these variables was beyond the scope of this study. Nevertheless, when conducting intake assessments for girls with behaviour disorders, clinicians need to seek specific information about variables within the individual characteristics and abuse components and how they unfold in the girls’ lives, as the presence of these risk factors may reflect comorbidity and thus the need for additional supports. This finding is consistent with existing literature on comorbidity, indicating that comorbidity is associated with harsher psychosocial conditions (Angold et al., 1999; Clarkin & Kendall, 1992) and impairment across settings (Ezpeleta, Domenech, & Angold, 2006). The results of this study underline the importance of assessing girls with behaviour disorders for depression and other internalizing disorder symptoms when warning signs are evident, to ensure that the girls receive the assistance that meets their treatment needs.

It may appear that the other three components (family context, academic achievement, and family circumstances) are not related to predicting comorbidity but it is important to note that the overall logistic regression model is statistically significant. Although not statistically significant in themselves, the other three components in some combination still contribute to the model. In the MANOVA analysis, no individual component was significant but the model was significant. The lack of significance for each of the individual components is likely due to the small sample size. It is interesting though that the variables within the family circumstances and family context are not significant contributors to either model. Given the established literature about the negative impact of witnessing family violence, poverty, family stress, quality of child and caregiver interaction (Corrado et al., 2000; Fergusson et al., 1996; Fergusson & Woodward, 2000; Herrenkohl et al., 2001; Kim et al., 2003; Knutson, Lawrence, Taber, Bank, & DeGarmo, 2009) and the fact that available research suggests that children with comorbid disorders come from more disadvantaged and stressed families (Angold et al., 1999; Clarkin & Kendall, 1992),
this lack of significance is noteworthy. Another possibility is that the impact of general hardship may not be as strong of a contributor to development of comorbidity than more personally experienced interactions such as abuse. Perhaps there may be some undetected resiliency factors at play, protecting the girls from the harm incurred by harsh conditions. The results do not show these general hardship variables to contribute significantly to comorbidity but the analyses conducted may not have been sensitive enough to detect how they interact. In fact, there are many ways in which these hardship variables may be contributing that were unable to be detected by this study’s analyses. The risk factors for disruptive behaviour disorders are similar to the risk factors for comorbidity; however, the combination or extent of the risk factors present in a child with comorbid disorders is considered to be harsher. Given that the risk factors are very similar, but experienced to different degrees, it makes it difficult to isolate those relating specifically to comorbid disruptive behaviour disorders especially when using a small sample size.

**Parental depression.** It was also puzzling that parental depression did not fit into any of the principal components, nor was it a statistically significant predictor within the logistic regression equation. There is an extensive, well-established body of literature that highly correlates parental depression with childhood behavioural problems (e.g., Herwig et al., 2004) and with childhood depression (e.g., Kaslow et al., 1994). Based on research evidence it was assumed that parental depression would be a variable found to contribute to the development of comorbid conditions (Downey & Coyne, 1990; Ormel et al., 2005). As a result of their depression, depressed caregivers, may experience challenges with meeting the needs of their children possibly increasing the risk for neglect and a harsher environment (Downey & Coyne, 1990; Ormel et al., 2005) which is linked to comorbidity (Angold et al., 1999; Clarkin & Kendall, 1992). Additionally, genetic links between parental and child depression may also
contribute to the presence of depressive symptoms and therefore comorbidity in children of depressed parents. The small sample size may have limited the ability to detect the role parental depression may play in the development of comorbidity. The lack of findings could also be due to a selection bias within the sample and the possibility that more depressed parents were not part of the study. Parents who consented to participate in the Bridging the Gender Gap study and subsequently participated in the concurrent girls’ and parents’ SNAP® GC groups may have been less depressed and better able to cope from the beginning. The initial BDI scores at Time 1 support this possibility given 73% of caregivers scored in the minimal to mild range suggesting less impairment. While not detectable in this study, parental depression most likely does contribute to comorbidity in children, given established links in the literature. This is an area that requires further study.

**Hypothesis 2: Differential Response to Treatment**

Girls who present with comorbid disorders at intake experience changes in behaviour more gradually during treatment and in the follow-up period than girls who do not present with comorbid disorders.

The second hypothesis was not confirmed. It was anticipated that behaviour change would be more gradual for girls with comorbidity and continue to occur over time after participation in the concurrent girls’ and parents’ SNAP® GC groups as the girls became more proficient at implementing the skills they learned in the program and as they received positive reinforcement for their skill use. Thus, to compare the rates of change and maintenance of treatment gains between the two groups, symptom levels were monitored before participation in concurrent girls’ and parents’ SNAP® GC groups, immediately after, and for up to 18 months after the groups were completed. Differences in results between the two groups were expected due to the synergistic rather than additive effect that comorbidity has on girls’ behaviour. However, what was expected and what was observed was different.
The comorbid group experienced a steeper rate of change in behaviour than girls who did not present with comorbid disorders. The girls who presented at intake with comorbid disorders also scored significantly higher prior to participation in the concurrent girls’ and parents’ SNAP® GC groups than the noncomorbid group on the externalizing scale of the Child Behavior Checklist (CBCL), $F(1,79) = 32, \rho = .00$, and internalizing scale of the CBCL, $F(1,79) = 128.2, \rho = .00$. Consistent with the EF, the finding that externalizing scores were significantly higher for participants in the comorbid group prior to treatment suggesting that comorbid conditions might aggravate other conditions and increase the seriousness of the experienced symptoms. This finding corresponded with the finding in the literature that children with comorbid disorders experience a greater level of impairment (Ezpeleta et al., 2006; Kazdin & Whitley, 2006).

Results of the HLM (hierarchical linear) model indicated that the girls with comorbid conditions made positive progress in response to the concurrent girls’ and parents’ SNAP® GC groups in both externalizing and internalizing symptoms. These results are very encouraging, especially given that these groups do not specifically target internalizing symptoms. In fact as noted, the rate of observed change was steeper—significantly different—for the comorbid group than the noncomorbid group. These results might have been due to the comorbid group’s higher number of presenting symptoms, which might have allowed for more opportunity for change given the reciprocity of the girl’s behaviour and the environmental response. Girls with behaviour problems scoring in the high severity category often disrupt many family routines, classroom activities, and community events. If girls and their caregivers start to use the skills taught in treatment, along with recieving positive reinforcement, then new patterns of behaviour can emerge across settings. The desire to use such skills can then increase, which in turn, because of positive reinforcement by the broader environment, might partially explain the
steeper or more rapidly detected changes. Another possible explanation for the differences between change rates was that the girls in the noncomorbid group had fewer symptoms at treatment onset, which might have made it more difficult to detect and document changes as easily as it would have been in comparison to girls with more severe symptoms, thus suggesting the need to use multiple informants, direct observation, and multiple measures to more accurately identify changes.

Kazdin and Whitley (2006) conducted a study comparing the treatment response between children with one diagnosis, with two diagnoses and with three or more diagnoses. Of importance was the significant positive treatment response observed in the group with ODD and two or more diagnoses. They repeated the process for children with CD and found that children with CD and two or more diagnoses experienced positive significant therapeutic change in comparison to the group with CD only. Doss and Weisz (2006) also examined the role of comorbidity on treatment outcome. They found that children with high severity levels experienced more change as a result of treatment but had higher symptom levels compared to their peers at the conclusion of treatment. Of note comorbidity using the same CBCL externalizing and internalizing scales used in this study to define comorbidity was not found to be related to outcomes. Consistent with findings from Kazdin and Whitley’s (2006) study the comorbid group experienced more change than the noncomorbid group. Consistent with Doss and Weisz’s (2006) study severity of symptoms at onset was related to symptom levels at post-treatment. Symptoms of the girls in the comorbid group remained in the clinical range at the end of the concurrent girls’ and parents’ SNAP® GC groups, indicating additional services are required to address their treatment needs. The externalizing scores continued to decline during the follow-up period for both groups, which is promising. This might suggest that as girls and caregivers gain confidence with skill use additional benefits are realized.
Another possible explanation for the continued decrease in reported symptoms is that a positive treatment experience may have encouraged girls and their caregivers to continue in the additional services available after completing the initial groups. This highlights the potential importance of the adjunct services provided by SNAP® GC which were specifically designed to build upon the gains made in the SNAP® GC groups (see Hypothesis 3: Clinical Needs and Clinical Significance). In addition, it is possible that a positive treatment experience may have encouraged girls and their caregivers to seek additional assistance from local community resources.

**Hypothesis 3: Clinical Needs and Clinical Significance**

Participation in the SNAP® GC program reduces symptoms of comorbid disorders but does not fully address the clinical needs of girls with comorbid disorders, as girls remain within the clinical range of comorbid disorders upon program completion.

The third hypothesis was supported. Although girls in the comorbid group experienced a steeper reduction in symptoms than girls in the noncomorbid group, over half of the girls (56%) in the comorbid group remained within the clinical range at the end of concurrent girls’ and parents’ SNAP® GC groups for both externalizing and internalizing behaviour disorders. As well, many girls (76%) within the comorbid group remained in the clinical range for externalizing behaviour disorders at the completion of these two program components, with a group mean of 68.04. By comparison, 72% of the girls in the noncomorbid group remained in the clinical range for externalizing behaviour disorders at the completion of these two program components, with a group mean of 63.85. Therefore, although positive treatment gains were realized and both externalizing and internalizing symptoms were reduced for girls in the comorbid group, and externalizing symptoms were reduced for the girls in the noncomorbid group, some treatment needs of girls in both groups were not directly addressed by the program.
Calculating for the full group, a medium effect size was indicated for externalizing scores and a small effect size was indicated for internalizing scores. A small effect size for the noncomorbid group was found for both externalizing and internalizing symptoms. On the other hand, effect sizes for the comorbid group were quite encouraging for both externalizing and internalizing scores from pre- to post-concurrent girls’ and parents’ SNAP® GC groups and from pre-to post-18 months. A borderline large effect size was detected in the comorbid group from pre- to post-concurrent girls’ and parents’ SNAP® GC groups and a large effect size was detected from pre- to post-18 months for externalizing scores. Of particular importance is the positive strong medium effect size detected for internalizing scores for the comorbid girls from pre- to post-concurrent girls’ and parents’ SNAP® GC groups and the large effect size detected from pre- to post-18 months. Although encouraging, the greater reduction in externalizing symptoms in the comorbid group might be attributed in part to the fact that there was greater room for improvement. The results for the group of girls with comorbidity were consistent with a research study on boys, which found that as externalizing symptoms decreased, internalizing scores also decreased (Lahey, Loeber, Burke, Rathouz, & McBurnett, 2002).

The numbers needed to treat for the comorbid group indicate that 7.4 girls needed to be provided treatment for one girl’s score to drop below the clinical range for externalizing and internalizing problems. This result suggests that the effect sizes detected were not necessarily clinically significant. It could be argued that any reduction would be clinically significant. However, if a girl’s problems remained in the clinical range the implication would be that she was continuing to experience substantial difficulties affecting areas in her life such as family, school, and peers, which clearly would indicate the need for additional assistance. Without additional assistance, and consistent with the EF, unaddressed needs would negatively influence
the reciprocal interactions between the girl and her environment, and could lead to additional negative experiences for the girl and her family, community, and society.

It is important to recognize that this study focused on the reductions detected in symptoms after the concurrent girls’ and parents’ SNAP® GC groups, which constituted only the first two components of the treatment program received by the participants. The study was not an analysis of the SNAP® GC program as a whole which, as previously stated, consisted of a core SNAP® GC girls’ group, a concurrent parents’ group, and a Girls Growing Up Healthy group. In addition, adjunct services targeting identified specific need and risk areas are provided to the girls and their families, after completion of the concurrent girls and parents’ SNAP® GC groups (see program map in appendix B). Therefore treatment had not yet been fully completed for the Bridging the Gender Gap sample.

**Clinical Implications**

The results of this research study underscore the need to develop interventions for girls with comorbid disorders. The fact that the problems of many girls in the comorbid group remained in the clinical range at the completion of treatment suggests the need to continue work on developing more effective comorbidity interventions. This does not negate the positive reduction of externalizing and internalizing symptoms for girls with comorbid disorders at the completion of the SNAP® GC program. In fact it suggests a previously unidentified strength of the SNAP® GC program. It is clear that the program partially addressed treatment needs for the comorbid group of girls. Therefore, in keeping with the scientist-practitioner model adopted by the Child Development Institute, rather than develop a completely new program, perhaps enhancements designed to help girls apply the skills developed in the existing program to address internalizing problems are what is required to shift the girls’ symptoms from the clinical to nonclinical range. For example, greater emphasis and practice during group sessions on
disputing cognitive distortions related to internalizing symptoms may assist the girls with understanding they can use skills from the program to help them in all areas of their lives. Another possibility would be “booster sessions” designed specifically to assist girls in transferring skills developed in the program to assist them in managing internalizing symptoms. 

Given evidence in the literature and the results of this study a treatment program designed to address comorbid externalizing and internalizing problems would include concurrent girls and parents groups. In addition, more involvement with other potential supports such as teachers would be incorporated to help address issues and reinforce skill development simultaneously across multiple contexts within the girl’s environment. Essential components to include in the girls treatment group would be the development of self monitoring skills, positive self talk, assertive communication skills, affect recognition and expression, disputing cognitive distortions, making friends, and understanding the link between trauma and acting-out or self harming behaviours (Morgan & Patton, 2002; Pepler, et al., 2010; Weiss et al., 2003). The parents treatment group would focus on helping parents strengthen their relationships with their daughters, understanding both the development of behaviour and depressive disorders, developing effective parenting strategies, problem solving, anger management and assertive communication skills, how to assist their daughters in developing her communication and problem solving skills, and problem solving potential barriers to treatment participation (Morgan & Patton, 2002; Pepler et al., 2010; Weiss et al., 2003). The modified intervention would increase the focus on relationships at the beginning of the program which differs somewhat from the current approach. The increased focus on relationships will help to facilitate parental monitoring of depressive symptoms and thoughts. The modified intervention would focus on skill development for handling emotions beyond anger and frustration to include addressing cognitive distortions which contribute to depressive feelings. It is important to
involve significant adults across as many domains in the child’s life as possible to assist in monitoring depressive symptoms and help girls in generalizing skills to better manage their behaviour and feelings.

The results from this study are consistent with Kazdin and Whitley’s (2006) and Doss and Weisz’s (2006) studies, which clearly demonstrated that case complexity and comorbidity did not negatively affect the ability of children with comorbid conditions to benefit from treatment. In fact, Kazdin and Whitley (2006) observed the greatest therapeutic benefit was experienced by those who presented with multiple disorders. Comorbidity should not disqualify children from receiving treatment, nor should children with comorbid disorders be provided with treatment that is not designed to meet their treatment needs completely. Yet, similar to the gender bias noted in research by Eichler (2004), comorbidity has been widely studied but researchers have made few if any comparisons of the treatment responses of participants with single disorders and those with comorbid disorders (Ollendick et al., 2008). The results of this study and of Kazdin and Whitley’s (2006) and Doss and Weisz’s (2006) studies clearly indicated that children with comorbid symptoms who participated in these programs were not harmed. This finding is of great importance as it reassures clinicians that including girls with comorbid disorders in these and similar programs is not harmful and, on the contrary, participation in these treatment programs is quite helpful.

Consistent with Andrews, Bonta, and Hoge’s (1990) work, which discusses the importance of matching treatment approach and need level, it is important that full assessments are conducted before developing treatment plans in order to ensure girls and their families are properly matched with treatments. Mismatches may result in the girls and their families not feeling understood, and may lead to reluctance on their part to participate in the treatment or to pursue additional assistance. Results from this study point to several key areas for assessment;
information should be sought regarding the child’s behaviour and coping, relationships with peers, school functioning, family context, and abuse and trauma history. Particular attention needs to be paid to these risk factors in order to identify girls with comorbid conditions as early as possible. Using a formal assessment tool such as the EARL 21-G can help the clinician to complete a comprehensive review of the kind and degree of key risk factors present to help guide the treatment planning process.

Since the early 1990s the Canadian political system has consistently moved to reduce resources available to address mental health problems (Mental Health Commission of Canada, 2009). Cutbacks to resources addressing mental health concerns have created a painful situation for children and families in need (Clarkin & Kendall, 1992; Mental Health Commission of Canada, 2009). This lack of investment in addressing the social problems experienced by many families continues to contribute to the many different manifestations of mental and physical health problems that, when unaddressed, cost society millions of dollars (Canadian Mental Health Association, 2004). Of great concern is the recognition that individuals presenting with comorbid conditions may require additional services.

Recently, Canada has identified mental health concerns as a priority with children’s mental health needs being recognized as a high priority (Mental Health Commission of Canada, 2009). Hopefully, this new recognition will help to create resources dedicated to addressing the complexity that comorbid conditions present to clinicians, program developers, and researchers.

**Limitations**

This study has provided new insights into contributing factors to comorbidity and the treatment response for girls with internalizing and externalizing comorbid conditions. Further research is needed to build on these findings and to address the limitations associated with this study.
The sample used for this study was an important and rarely available clinical sample, which provided crucial information. Nevertheless, its small size was perhaps the study’s greatest weakness. The small sample size limited the type of statistical analyses possible to answer the research questions. For example, it was not possible to examine separately the role of each identified risk factor hypothesized as contributing to the development of comorbidity. Rather, components comprising a collection of variables needed to be used. It would be beneficial to explore each of the possible contributing variables separately to gain further insights into the profile of factors that in combination increase the risk of comorbidity. In addition, the small sample size may have restricted the sensitivity of the analyses to detect important information.

A second limitation to the study was the limited number of informants. Depending on their age several different measures were used by the SNAP® GC research team to collect self-reported data from the girls during the Bridging the Gender Gap study. It was not possible to use these data, as it was not feasible to break the sample of girls into subgroups. Thus caregivers and clinicians were the sources of the data used from the Bridging the Gender Gap study to answer this study’s questions. Future studies using the same measures to collect data from all girls could add the girls’ voices directly to the analyses. The girls’ voices would provide different information from their caregivers. For example, researchers have found that children generally provide a richer understanding of the internalizing symptoms they experience (Ryan, 2001). Negative cognitions and self-talk, important in internalizing behaviour disorders, are generally unobservable to the caregiver, which is why it is so important to add the girls’ own voices to future studies. In contrast, externalizing behaviour disorders involve behaviours which can be observed by caregivers and other adults in a child’s life.

A third limitation to the study was the strict focus on risk factors within the individual girl and her environment, with no accompanying focus on possible resilience factors—personal
and environmental strengths—that might help to moderate or problems or prevent them from recurring. This limitation of the data set resulted in no available variables to use to investigate resilience factors. Understanding how an individual can use resilience factors in her environment to help her develop has important implications for treatment providers. A common counselling tenet is to start where the client is. This does not only mean identifying problems but also means drawing from a girl’s strengths to help her build on previous successes in dealing with adverse conditions. Consistent with the EF, treatment providers who identify areas of strength and resiliency as well as areas requiring assistance will have a more comprehensive understanding to assist girls to leverage their resiliency factors.

A fourth limitation to the study was the operational definition of comorbidity used, defined as a score in the clinical range for externalizing and internalizing problems on the Child Behaviour Check List (CBCL). Depression, anxiety, and somatic problems are included in the internalizing scale and attention deficit disorder, oppositional defiant disorder, and conduct disorder are included in the externalizing scale of the CBCL. Due to the small sample size, these disorders could not be separated for purposes of analysis. The different possible variations of comorbidity and response to treatment were therefore not investigated. Some girls in the noncomorbid group may not have been comorbid for internalizing disorders but may have been comorbid with attention deficit disorder. It is essential we begin to explore the potential differential response to treatment that exists for the multiple ways comorbidity may exist within children with conduct disorder (Angold et al., 1999).

A fifth limitation was the inability to examine the community context of the girls, due to the lack of community level variables available from the Bridging the Gender Gap study data. Two community level variables were available for this study. Postal codes were used to identify neighbourhoods as advantaged or disadvantaged based on poverty levels. The second variable
(neighbourhood conditions) was from the EARL 21-G. More information is needed on community conditions beyond poverty levels, including such things as community resources, crime rates, and schools. Such additional information would help to provide a more thorough analysis of this important level in the child’s environment and how these variables may contribute to comorbidity.

**Future Directions**

Further research is needed to learn more about the profile of girls with comorbid disorders. Future studies that use a randomly selected, longitudinal population sample of girls with multiple informants should include the girls’ direct experiences. It will be important for investigators to use the same parallel measures across informants so that valid statistical comparisons can be made. Measures need to be balanced in focus, to capture not only the presence or absence of risk factors, but also to capture the presence or absence of protective factors. The measures used in this study focused more on problematic behaviours and risk factors than on strengths within the child, family, and larger context and thus miss a potential key explanatory element about why some children develop comorbid conditions in harsh contexts and why others do not. Exploring the role of resiliency and protective as well as risk factors is not only consistent with the understanding the EF, but is also a core value of the social work profession. Studies with this type of research protocol will further illuminate the risk and protective factors for comorbid conditions. Results from such studies could guide policy makers and prevention and early intervention programs.

To address the needs of children with comorbid disorders, clinical responses should be guided by evidence-based interventions. Additional research to inform the development or modification of treatment programs for children with comorbid conditions is desperately needed. The results of this study are only generalizable to other cognitive-behavioural programs
for girls with CD. There are other treatment approaches for disruptive behaviour disorders that require further investigation regarding effectiveness and suitability for treating girls with comorbid behaviour disorders. Intervention research testing the efficacy and effectiveness of new and modified programs would help to alter the established negative trajectories identified for children experiencing comorbid disorders.

As well, further studies are needed to determine whether each disorder would best be treated separately and in what sequence, or whether it would be best to provide treatment for comorbid conditions simultaneously. The issue of whether to treat comorbid disorders simultaneously or sequentially (and if so, in what order) remains unanswered, despite the fact that this question has been raised in the literature as a key issue since the early 1990s (Clarkin & Kendall, 1992). This may be due in part to the lack of resources available for research and program development. Chorpita and colleagues’ (Chorpita, Daleiden, & Weisz, 2005) distillation and matching model offer clinicians some guidance. The model involves reviewing the literature and distilling effective intervention strategies from studies to be used with clients who present with similar clinical profiles. This approach provides a mechanism by which clinicians can use an evidence-based decision-making approach to enhance existing evidence-based interventions such as SNAP® GC which has been shown to be promising for girls with comorbid conditions but does not fully address their treatment needs. This is an important area for continued research, as practitioners and policy makers only have partial answers on how to meet the complex needs of these girls.

**Conclusion**

This study’s results clearly underline the differential risk profile and treatment responses of girls with comorbid externalizing and internalizing disorders compared with girls who have externalizing disorders only. The results draw attention to a cluster of child characteristics and
abuse history that mark a different risk profile for girls with comorbid disorders compared to girls with only externalizing disorders. Girls with comorbid conditions clearly benefitted from participating in the SNAP® GC program with reductions in both internalizing and externalizing problems but the results also suggest additional assistance is required. Results of this study add to the scant literature available on treatment response and comorbidity in girls with comorbid externalizing and internalizing disorders. They provide a limited but important piece of the puzzle which can provide direction on several levels. Program developers, researchers, and clinicians at the Child Development Institute can use these findings to further develop the SNAP® GC program. Future research can build upon the findings made in this study by focusing on discovering fuller answers to the partially answered questions. Clinicians can use the results to guide their practice, assessment, and development of evidence-based interventions for girls with comorbid externalizing and internalizing disorders.
APPENDIX A

ECOLOGICAL THEORETICAL FRAMEWORK
ECOLOGICAL THEORETICAL FRAMEWORK

Theories

- Social Strain Theories
- Structural-Functionalist
- Conflict Theory
- Social Development Model

- Social Learning Theory
- Differential Association Theory
- Social Development Model

- Attachment Theory
- Early Starters
- Life-Course Persistent
- Social Learning Theory
- Coercion Theory
- Self-Control Theory
- Differential Association Theory
- Social Development Model

Risk & Protective Factors

Community

Risk: Limited community resources, high crime rates, presence of gangs
Protective: Accessible social supports – cultural networks, strong bond to school

Peers

Risk: Peer rejection, strained peer relationships, victimization by peers
Protective: Prosocial peer group promoting prosocial behaviours

Family

Risk: Strained relationship, punitive parenting, low SES
Protective: Consistent parental monitoring, family cohesion & warmth

Individual

Risk: Antisocial attitudes, abuse, developmental problems, out of home placements, coping and adaptability
Protective: Positive self-esteem, academic progress, and social skills
APPENDIX B

SNAP® GC PROGRAM MAP
This map was developed using information from Levene, 1997; Pepler et al., 2010; Walsh et al., 2002.
REFERENCES


Marx, K., & Engels, F. (1986). The Communist Manifesto (J. Wayne, Ed. & Introd.). Toronto, Ontario, Canada: Canadian Scholars’ Press. (Original work published 1848)


