MENTAL HEALTH PROFILES AND NEEDS OF YOUTH WITH SERIOUS BEHAVIOUR PROBLEMS

by

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ABSTRACT

The current study examined the mental health profiles (current and lifetime) of adolescent girls and boys with serious behaviour problems. Age of onset, gender differences and comorbidity patterns were described. Youth in this study had substantial comorbidity, with approximately three quarters of youth with conduct disorder meeting criteria for at least two additional lifetime mental health disorders. Males and females had comparable rates of conduct disorder, ADHD, and substance dependence disorders; however, significantly more females than males met criteria for internalizing disorders (major depressive episode or PTSD). Age of first symptoms started at approximately 11-13 years of age in early adolescence. Approximately two thirds of the youth met criteria for childhood onset conduct disorder and one third met criteria for adolescent onset conduct disorder, with no gender differences. These findings highlight the need for early, comprehensive interventions for youth with serious behaviour disorders.

Keywords: Conduct Disorder; Mental Health; Comorbidity; Behaviour Problems; Adolescent

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1: INTRODUCTION

Understanding the needs of youth with severe behaviour disorders is a complex public health and socially relevant issue in Canada. Conduct disorder (CD), the mental health term for severely behaviourally disordered youth, is characterized by persistent antisocial behaviours including bullying, cruelty, stealing, weapons use, fire setting, lying, running away and truancy (Kazdin, 1995), and affects over 4% of children in Canada (Waddell, Offord, Shepherd, Hua, & McEwan, 2002). Such behaviour in youth often results in their involvement with the justice system. The legal term for youth involved with the justice system is "young offender" (Bell, 2002). Health service costs for conduct disorder can total as much as $13 000 per child for outpatient services in a six month period (Foster, & Jones, 2005; McCrone, Knapp, & Fombonne, 2005). Moreover, it costs nearly $100 000 annually just to keep one youth in secure custody in Canada (Werry, 1997). A more recent estimate in the United Kingdom puts the cost of incarceration at £4645 ($10,559 CAN) per month (Barrett, Byford, & Chitsabesan, 2006). Above and beyond the substantial monetary cost associated with conduct disorder, is the suffering of victims and their families, as well as the projected lifetime costs for these behaviourally disordered youth as a results of lower educational achievement, poor vocational adjustment and early parenthood (McCrone et al., 2005). Furthermore, if untreated, youth with conduct disorder are at risk for developing antisocial personality disorder in

adulthood (Loeber, Green, Lahey, Frick & McBurnett, 2000).

The current study focuses on the mental health needs of youth with serious behaviour disorders. Conduct disorder has two developmental trajectories, childhood-onset (at least one symptom before 10 years of age) and adolescent-onset (absence of symptoms before 10 years of age). These subtypes have been shown to have different risk factors; however, less is understood on the varying mental health profiles and comorbidities of these youth. Therefore, this study provides information on the diagnostic mental health profiles of these subtypes in an effort to better understand prevention and treatment needs. Furthermore, until recently much of the research on behaviour disorders was conducted predominantly on males, therefore this study will emphasize understanding both males and females and the diagnostic mental health patterns of these youth.

1.1 Mental Health Profiles of Youth with Severe Conduct Problems

Youth with severe behaviour problems are commonly diagnosed with a wide range of co-occurring mental health disorders. Understanding the rates of comorbidity in this population is essential to understanding treatment needs because compared to pure disorders comorbid disorders have an earlier onset, a more chronic course, more complicating factors that interfere with treatment compliance, poorer response to treatment, and poorer prognosis (Brown and Barlow, 1992; Clarkin & Kendall, 1992; Shea, Widiger, & Klein, 1992; Verhulst & van der Ende, 1993). The following review of the literature will describe the

research of behaviourally disordered youth in the community or mental health settings as well as youth involved in the criminal justice system. In both populations, the majority of youth meet criteria for conduct disorder; however, subclinical behaviourally disordered youth are also included in some of the studies. The review will discuss gender differences and comorbidity in community or mental health settings first, followed by a review of the gender differences and comorbidity in criminal justice system. Next, a review of the age of onset (childhood versus adolescent-onset conduct disorder) will be provided in relation to comorbidity as well as gender differences.

1.1.1 Comorbidity and Gender Differences: Community and Mental Health Setting Populations

A longitudinal study conducted by Moffitt, Caspi, Rutter, and Silva (2001) collected data on 154 boys and 72 girls diagnosed with conduct disorder and found that 88% of the boys and 93% of the girls met criteria for one or more disorders. The most common comorbid diagnoses in youth with conduct disorder are depression, Attention-Deficit/Hyperactivity Disorder (ADHD), anxiety disorders, and substance use disorders (Connor, Ford, Albert, & Doerfler, 2007; Moffit et al., 2001; Ehrensaft, 2005).

Although females are diagnosed with conduct disorder less frequently than males (Loeber & Keenan, 1994) they are more likely to have higher rates of comorbidity and more complex mental health profiles (Keenan, Loeber, & Green, 1999). Some call this a *gender paradox* in that even though conduct disorder

occurs at a lower prevalence in females compared to males, females tend to be more seriously affected and impaired.

In general, the body of research shows that behaviourally disordered females are more likely than males to experience internalizing disorders. The Dunedin Longitudinal Study conducted by Moffit et al. (2001) on youth with conduct disorder found that more females had anxiety (72% females versus 45% males) and depression (72% females versus 35% males). Although there is a clear comorbidity pattern between sexes in this study, logistic regression revealed no statistically significant sex differences for either disorder. However, upon analyzing the symptoms dimensionally, they found that depression was more common in females after the age of 15 years. Consistent with this finding, Keenan et al. (1999) also found that depression was comorbid with conduct disorder in girls more often than in boys. However, the sequencing for depression has not yet been confirmed as there are mixed results whether depression comes before or after conduct disorder in adolescence. Understanding comorbidity rates of depression and conduct disorder is essential because of the associated high rates of suicidal behaviour, especially in females. Wannan and Fombonne (1998) found that in a sample of 5,426 adolescent psychiatric outpatients, antisocial behaviour was a risk factor for suicidal behaviour in females and not males.

There is some evidence that suggests that more males than females with conduct disorder have comorbid substance use disorders: alcohol dependence (43% males and 31% females), marijuana dependence (38% males and 27%

females), although these were not statistically significant differences (Moffit et al., 2001). Substance use disorders are an important comorbid disorder to examine in these youth, as some say that it can exacerbate conduct problems (Keenan et al.,1999).

ADHD is a common diagnosis for youth with conduct disorder (Loeber, & Keenan, 1994). The co-occurrence of hyperactivity and conduct disorder problems have been associated with poorer outcomes than either disorder on its own (Lahey & Waldman, 2003). One study found that young people with comorbid conduct problems and hyperactivity/impulsivity had a higher risk of being involved in crime than those with a single diagnosis (Babinski, Hartough, & Lambert, 1999). The Dunedin Longitudinal Study conducted by Moffitt et al. (2001) found that more males than females had co-occurring ADHD (23% males and 9% females) although this again was not found to be a statistically significant difference. Although there is evidence that ADHD is more common in boys than girls, ADHD was found to predict a greater variety of later problems among girls than boys (Clarizio, 1997), consistent with the gender paradox theory.

1.1.2 Comorbidity and Gender Differences: Criminal Justice System Populations

Another common approach to exploring the mental health needs of severely aggressive youth is to study youth involved in the juvenile justice system. This is because conduct disorder is the most prevalent diagnosis for juvenile offenders, with rates ranging depending on the study methodology. Fazel, Doll, and Långström (2008) conducted a metaregression analysis on 25

surveys examining mental health disorders in adolescents in juvenile facilities and found that approximately 50% of these youth met criteria for conduct disorder. The importance of understanding the mental health needs of juvenile offenders led Odgers, Burnette, Chauhan, Moretti, & Reppucci (2005) to conduct a review of the various studies in the United States and Canada that have examined the mental health profiles of incarcerated youth. Odgers et al. suggests that we may be "misdiagnosing the problem" of juvenile offenders by thinking that the antisocial behaviour is their main mental health challenge, where many of them face multiple comorbid disorders. Research from Canadian and American correctional settings suggests that a significant percentage of all incarcerated juveniles (46-83%) meet criteria for two or more DSM-IV disorders (Abram, Teplin, McClelland & Duncan, 2003; Otto, Greenstein, Johnson, & Friedman, 1992; Uzlen, & Hamilton, 1998). The most commonly reported forms of psychiatric comorbidity within these populations are a substance abuse disorder with a mood disorder (Odgers et al., 2005).

One of the most comprehensive studies of the psychiatric profiles of juvenile detainees conducted in the United States, titled the Northwestern Juvenile Project (Abram et al., 2003) assessed the mental health profile of 1,829 males and females. The study found that nearly two-thirds of males and nearly three-quarters of females met criteria for one or more psychiatric disorders in the last six months. One-half of males and almost one-half of females met criteria for a substance use disorder. Slightly more females than males met criteria for an affective disorder (25% females and 20% males).

Similar to the studies on conduct disorder conducted in the community and clinics, studies examining the difference between incarcerated boys and girls have found that girls in juvenile justice facilities display significantly more mental health problems than do boys (e.g. Timmons-Mitchell et al., 1997). Compared to female youth in the community, female juvenile offenders are three times more likely to have clinical symptoms of depression or anxiety (Kataoka et al., 2001). One study found a current mood disorder in 88% of incarcerated female youth (Timmons-Mitchell et al., 1997). Another study found that female incarcerated offenders were twice as likely to have posttraumatic stress disorder compared to male incarcerated youth (Cauffman, Feldman, Waterman, & Steiner, 1998). Wasserman, McReynolds, Ko, Katz, and Carpenter (2005) found that girls were at elevated risk for comorbid anxiety or affective disorders than males at juvenile probation intake. Substance dependence/abuse is also high in the female juvenile offender population, with estimates from 56% to 87% (Timmons-Mitchell et al., 1997; Myers, Burket, Lyles, Stone, & Kemph, 1990).

The substantial mental health comorbidity found in youth with conduct disorder is important to understand in order to provide proper treatment and rehabilitation and to decrease the risk to reoffend in adolescence. The large range in the prevalence of the diagnostic profiles of these youth suggests that more research is needed to understand their needs. A more reliable and comprehensive assessment of mental health profiles is needed. Moreover, there might be differences in the mental health profiles of youth in the United States compared to Canada. Since there is little research on Canadian samples, more

research is needed on youth within the criminal justice system in Canada. In addition to research on the current needs of youth in the juvenile justice system, understanding when these behaviours started and what the needs of these high risk youth were in childhood is necessary to prevent such behaviours in adolescence. Therefore, more information is needed on the different mental health profiles of childhood versus adolescent-onset CD. Existing research on this topic is discussed in the following section.

1.1.3 Comorbidity, Age of Onset, and Gender Differences

As mentioned earlier, the Diagnostic and Statistical Manual of Mental Disorders (DSM-IV; American Psychiatric Association, 2000) distinguishes two subtypes of conduct disorder: childhood-onset and adolescent-onset. The two subtypes have been researched predominantly in males and there are few studies that examine the developmental course of CD in girls. Since there are many studies that examine CD and antisocial behaviour in males, the framework and etiologies of the different onset subtypes has been assumed to be correct in females. The research in males has shown that the childhood-onset subtype predicts greater persistence of the disorder into adulthood, more physical aggression, and violent crime compared to the adolescent-onset subtype (Moffitt, 1993). The adolescent-onset subtype of CD is less pervasive and behaviours such as offending are likely to desist in adulthood (Moffitt, 1993).

Recently there has been a surge in research attempting to understand gender differences in the developmental trajectory of CD by studying females; however, this research is incomplete and has limitations such as small sample

sizes (e.g. Moffitt, 2001). Some of the studies suggest the presence of only one developmental trajectory in females called “delayed-onset”. The delayed-onset trajectory in females is characterized by an onset in adolescence with similar persistence and severity of behaviour to the childhood-onset subtype in males. However there is mixed support for this theory in the literature. There is some research that states that childhood-onset CD is less prevalent in females than males (Silverthorn, Frick, & Reynolds, 2001). Moreover, the profiles appear to be similar in personality traits such as impulse control and a callous interpersonal style for childhood-onset CD for boy and adolescent-onset for girls (Silverthorn et al., 2001). McCabe, Rodgers, Yeh, & Hough (2004) studied 212 males and 91 females recruited from the public sector (mental health facilities, school services, juvenile justice and child welfare systems), and found that half of the females and approximately two-thirds of males with conduct disorder had childhood-onset disorder. This suggests that childhood-onset is still more likely in males than females, but it is not as rare in females as previously was thought.

Little is available on the differing mental health profiles of these youth as only ADHD was included as a risk factor for type of onset in the McCabe et al. (2004) study. In both males and females, ADHD was found to be related to childhood-onset and not adolescent-onset, which is consistent with the hypothesis that early onset CD is accompanied by more complex mental health profiles in both males and females. A Canadian longitudinal study followed girls from kindergarden to grade 6, and the results showed there is an early-onset type of conduct disorder in girls that predicts a persistent trajectory of problem

behaviours into adolescence (Côté, Zoccolillo, Tremblay, Nagin, & Vitaro, 2001). However, this study was conducted on a nonclinical sample that utilized teacher reports. Although recent research has found that childhood-onset is less rare than previously thought (McCabe et al., 2004), little is understood about this subtype of early starter behaviourally disordered females.

Although there is research on some risk factors for the subtypes of conduct disorder in both females and males, there is only limited research on the comorbidity in relation to age of onset in both girls and boys. Connor et al. (2007) conducted a study on comorbidity and age of onset from a mental health facility with 53 youth, which included only 6 females meeting criteria for conduct disorder. Connor et al. found that childhood-onset CD had higher rates of ADHD, non-PTSD anxiety disorders, whereas adolescent-onset CD was related to PTSD and substance use disorders. This sample was predominantly male; therefore no conclusions can be made for female comorbidity and age of onset.

Due to the distinct etiologies of the subtypes and developmental trajectory of CD, the mental health profiles of these youth needs to be examined. The current study examined a more complete mental health profile in order to better understand comorbidity in relation to gender and age of onset. A more thorough understanding of the comorbidity patterns will allow for more effective prevention and treatment planning of these high risk youth. Furthermore, more research needs to be done on the mental health profiles of behaviorually disordered youth within Canadian settings, both clinical and criminal justice settings.

1.2 Current Study

The current study is primarily descriptive in nature. The aims of this study were to 1) describe the mental health profiles (current and lifetime) of adolescent boys and girls identified as having serious behaviour disorders within the mental health and justice systems; 2) to describe age of onset, gender differences and comorbidity patterns within this high risk sample.

It is predicted that the current and lifetime mental health needs of behaviourally disordered youth will include high rates of disorders above and beyond the primary diagnosis of conduct disorder. Based on the literature, it is anticipated that girls will have higher rates of current and lifetime internalizing disorders (major depressive episodes and PTSD), whereas boys will have higher rates of externalizing disorders (conduct disorder and ADHD) as well as substance dependence disorders. Furthermore, it is predicted that the age of onset for these disorders will start well before adolescence, as it is believed that some behaviourally disordered youth have mental health needs not met in childhood. Based on the literature on the gender paradox theory (e.g. Keenan et al., 1999), it is anticipated that females will have higher rates of lifetime comorbidity (multiple disorders) compared to males.

In regards to conduct disorder onset subtypes, it is predicted that more boys than girls will have childhood-onset CD compared to adolescent-onset CD. Furthermore, it is expected that childhood-onset for both girls and boys will have higher comorbidity rates than adolescent-onset conduct disorder.

2: METHOD

2.1 Overview

This study is part of a larger longitudinal project examining gender and aggression among high-risk youth. Select measures administered at Time 1 are included in this study. Time 3 data collection is currently ongoing.

2.2 Participants and Procedures

Participants at Time 1 were 179 adolescents (82 females, 97 males) between the ages of 12 and 18 with comparable mean age for females (M = 15.20, SD = 1.44) and males (M = 15.46, SD = 1.60; χ^2 = .29, p > .05). Approximately half were drawn from two custody centres (53%) and a probation office (2%), and 45% from a provincial assessment centre targeting youth with severe behaviour problems in BC.

In the youth justice settings, parental consent was sought to approach 132 youth and was refused by parents of 28 youth (21%). Of the 104 youth whose parents gave consent 5 youth (4%) refused to consent/assent and one youth withdrew prior to completing the study (<1%). In the mental health setting, parental consent was sought and received for 102 youth. Of these youth, 19 (19%) refused to give consent/assent and two (2%) withdrew prior to completing the study. No significant differences were found between youth who participated

versus those who did not participate with respect to age [F (1, 226) = .78, p > .05] and gender (χ^2 = .31, p > .05).

Given that the overall focus of the larger project was to explore gender differences efforts were made to approach all females admitted to the custody or mental health centre who were then matched with same aged males. The exclusionary criteria, which included an IQ below 70 and presence of a significant Axis I psychotic symptomatology, were assessed based on a file review in both samples. Youth who agreed to participate were administered three modules which were comprised of a number of semi-structured clinical interviews, self-report measures and a computerized assessment. Measures were administered in three separate testing sessions to reduce fatigue and enhance validity of responses. Each testing session required approximately 2 hours for completion and was administered by trained graduate students and research assistants. Participants received a $30 cash honorarium or a gift certificate after completing Time 1 measures. All assessments were digitally recorded for which consent was received.

Only youth who had full data on the measures of interest at Time 1 were included in the current study. The final sample for the current study consisted of 141 adolescents (76 males, 65 females) between the ages of 12 and 18 with a comparable mean age for females (M = 15.11, SD = 1.35) and males (M = 15.42, SD =1.46), χ^2 = 8.69, p > .05. In regards to ethnicity, three-quarters (75%) of the males and more than half (55%) of the females in the sample were Caucasian; 20% of the males and 29% of the females were of Aboriginal ethnicity; the

remaining youth self-identified as “Other” (Hispanic, African American, South Asian) ethnicity. Although there were differences in ethnicity for males and females, they were not statistically significant differences, $\chi^2 = 12.03$, $p > .05$

2.3 Measures

The *Diagnostic Interview for Children and Adolescents-Revised (*DICA-R; Reich, 2000) is a criteria based, structured, computer-assisted interview that maps onto the DSM-IV diagnoses commonly seen in children and adolescents. The DICA-R takes approximately 1-2 hours to administer which was carried out by trained graduate students at Time 1. The psychiatric disorders assessed through the DICA-R included conduct disorder (CD), attention deficit hyperactivity disorder (ADHD), substance dependence disorders (SDD; alcohol, marijuana, and street drugs), Major Depressive Episode (MDE), and posttraumatic stress disorder (PTSD)[1]. The age of first symptom presentation was also recorded from the DICA-R interview. Age of first symptom refers to the age when youth “first starting having these problems” as asked in the DICA-R after the diagnostic category for SDD, MDE and CD. For conduct disorder, age of onset was asked for each individual criteria and therefore the distinction between early versus late onset CD subtypes was calculated based on this. The advantage of the DICA-R is that unlike many other interviews, it measures lifetime as well as current diagnoses. *Lifetime* diagnoses indicates that the youth had met criteria for the

[1] Generalized Anxiety Disorder was originally included as a diagnosis measured; however, because of time limitations GAD questions in the DICA-R were dropped. GAD tends to have lower reliability estimates and therefore there is greater concern about coherence of the disorder, compared to other diagnoses measured.

disorder at one point in their life, whereas *current* diagnoses means that the youth currently met criteria for the diagnosis at the time of interview. According to the DSM-IV, a current diagnosis of CD requires symptoms within the last six months; MDE within the last month; ADHD past six months; and SDD within the past year. The DICA-R deviates slightly in how a current ADHD diagnosis is defined; instead of the timeframe being the last 6 months, it is the past year. This appears to be an error in the creation of the DICA-R; therefore, in the current study, a current diagnosis of ADHD refers to the criteria being met in the past year.

Research conducted on the DICA-R has shown good validity and test-retest reliability ranging from κ = .59 to .92 depending on the disorder being measured (De la Osa, Ezpeleta, Oomenech, Navarro, & Losilla, 1997). Overall, the De la Osa et al. study found that internalizing disorders had higher test-retest reliability compared to externalizing disorders with the exception of conduct disorder which had the highest reliability (κ = .92). Studies found no gender differences in the reliability of responses (Pérez, Ezpeleta, Massons, & Chapparro, 1998).

Time concepts, such as age of onset of symptom variables were a significant predictor of the variability in a study examining factors that affect test-retest reliability in the DICA, adolescent version (Perez et al., 1998). Therefore, the age of onset symptom variables will be interpreted with some caution, because of the limited reliability data. This is consistent with many other studies that show that age of onset symptoms is less reliable the further the respondent

is away from the event (Horwitz et al., 2001). However, overall Reich (2000) finds that there is good reliability and validity for lifetime diagnoses.

The *Clinician-Administered Posttraumatic Stress Disorder Scale* (CAPS; Blake et al., 1995) was used as a tool to measure lifetime PTSD for a portion of the youth in this sample. At Time 1 of the study, the decision was made to switch from measuring PTSD with the DICA-R, to using the CAPS because of the measure's superior psychometrics. The CAPS is a 30-item structured interview which corresponds directly to the DSM-IV PTSD criteria and was administered by trained graduate students. A review of the research using the CAPS was conducted by Weathers, Keane, & Davidson (2001) and concluded that the CAPS shows excellent reliability (test-retest, interrater, and internal) and validity (convergent and discriminant). Across several studies, interrater reliability was consistently at the .90 level and above, internal consistency was generally high, with alphas in the .80 to .90 range all the three PTSD symptom scales. Validity was also strong, and Weathers et al. summarized studies that found correlations of .70 to .90 for self-report measures of PTSD.

3: RESULTS

3.1 Prevalence of Mental Health Disorders of Youth in Mental Health and Justice Systems

The lifetime mental health profiles of youth in the sample were compared by site of recruitment in Table 1 using chi-square analyses. Approximately half of the sample (*n* = 74) was recruited from various youth corrections settings and the other half (*n* = 67) from a mental health treatment centre. Compared to population estimates (e.g. Waddell et al., 2002), rates of all disorders were substantially elevated. Comparing across sites, the prevalence of ADHD, MDE, and PTSD were not significantly different. Although the prevalence of CD was high in both samples, a significantly higher percentage of youth met criteria in the youth corrections (88%) as compared to the youth mental health sample (76%). This is not surprising as detention in correctional systems is based in part on engagement in antisocial behaviour. Although the prevalence of substance dependence disorders was exceptionally high in both samples, it was significantly higher in the youth corrections sample (97%) as compared to the youth mental health sample (74%). Again, this is not surprising as detention in correctional systems is more likely to occur when youth are engaged in substance use and associated antisocial behavior. Apart from these two differences, the sample showed similar profiles of other mental health problems (MDE, ADHD, and PTSD).

In light of the fact that the current study is focused on understanding the overall picture of mental health needs in high risk youth and implications for mental health services, rather than exploring differences between youth in correctional systems versus mental health systems, the samples were collapsed in subsequent analyses.

Table 1 Lifetime Mental Health Disorders by Site of Recruitment

	Site of recruitment			
	Total (N=141)	Youth Corrections (*n*=74)	Mental Health (*n*=67)	χ^2
CD	107 (76%)	65 (88%)	42 (63%)	12.16***
ADHD	95 (67%)	51 (69%)	44 (66%)	0.17
SDD	105 (74%)	72 (97%)	33 (49%)	42.69***
MDE	51 (36%)	27 (37%)	24 (36%)	.01
PTSD[a]	32 (37%)	16 (38%)	16 (36%)	.03

[a]PTSD data was available for 86 youth (42 youth corrections, 44 mental health site)
*** $p < .001$

3.2 Lifetime and Current Mental Health Disorders

Lifetime and current mental health profiles are compared by gender in Table 2. Information on whether or not youth met criteria currently for PTSD was not available as this question was not included in the DICA and therefore is not included in the table. As previously mentioned, c*urrent* disorders in this analysis are defined by the DSM-IV timeframe for currently meeting diagnostic criteria, whereas *lifetime* diagnosis refers to meeting criteria for the disorder at one point

in their life. In this study, the rates of CD were similar for lifetime and current diagnoses, as 76% of youth met criteria for CD at one point in their life, and 69% met criteria for the disorder in the last 6 months. The SDD prevalence rates were also quite similar, 74% of all youth met criteria for a SDD in their lifetime, whereas 70% of youth met criteria for a SDD in the past year. MDE lifetime and current prevalence rates were only slightly different as well, 36% versus 24% respectively. On the other hand, the percentage of youth who had a lifetime diagnosis of ADHD (67%) was quite a bit higher than those who currently had a diagnosis of ADHD (43%). This is not surprising given the fact that ADHD is a more common diagnosis in childhood and symptoms tend to lessen as youth age (American Psychiatric Association, 2000).

This information suggests that many youth in the sample are experiencing significant mental health needs including depression, attention difficulties, substance dependence and behaviour problems throughout their lives as well as currently.

3.3 Gender Differences in Lifetime and Current Mental Health Disorders

Further examination of the lifetime and current needs of these youth (Table 2) revealed important gender differences. Table 2 shows that gender differences for mental health needs are similar for both lifetime and current diagnostic profiles. Males and females in the sample have comparable rates of CD, ADHD, and SDD, whereas significantly more females than males experience MDE for both lifetime and current rates. In addition, females also experience

significantly higher rates of PTSD compared to males in their lifetime. This is consistent with the prediction that more females than males experience internalizing disorders (MDE and PTSD) in addition to the similar rates of externalizing behavioural problems (ADHD, CD) and substance dependence disorders (SDD).

Table 2: Lifetime and Current Mental health Disorders by Gender

	Lifetime				Current			
	Total (N=141)	Male (*n*=76)	Female (*n*=65)	χ^2	Total (N=141)	Male (*n*=76)	Female (*n*=65)	χ^2
CD	107 (76%)	61 (80%)	46 (71%)	1.72	97 (69%)	53 (70%)	44 (68%)	.07
ADHD	95 (67%)	51 (67%)	44 (68%)	.01	60 (43%)	31 (41%)	29 (45%)	.21
SDD	105 (74%)	54 (71%)	51 (79%)	1.01	99 (70%)	52 (68%)	47 (72%)	.25
MDE	51 (36%)	19 (25%)	32 (49%)	8.91**	34 (24%)	13 (17%)	21 (32%)	4.43*
PTSD[a]	32 (37%)	8 (20%)	24 (52%)	9.48**	-	-	-	-

[a] PTSD data was available for 86 youth (40 male, 46 female)
** $p < 0.01$

In light of the fact that the lifetime and current diagnostic profiles are similar for both males and females, the focus of the following analyses will be on examining lifetime diagnoses.

3.4 Lifetime Mental Health Profiles and Age of Onset

Table 3 summarizes age of first symptom for CD, SDD and MDE. Age of first symptom data was not available for PTSD diagnoses and information on

ADHD age of symptoms was reported as a dichotomous variable (either before or after age 7 years) and was included in the criteria for an ADHD diagnosis. For all three disorders (CD, SDD, and MDE), age of first symptoms occurred in pre to early adolescence for girls and boys, with girls showing a slightly but significantly earlier onset of first symptom of substance dependence.

Table 3: Lifetime Mental Health Disorders by Age of First Symptoms

	Total		Males		Females		
	M	*SD*	*M*	*SD*	*M*	*SD*	*t*
CD (*n*=107)	11.43	1.52	11.36	1.53	11.52	1.51	-.52
SDD (*n*=120)	13.20	1.41	13.44	1.44	12.93	1.33	1.99*
MDE (*n*=97)	11.84	3.07	12.28	3.08	11.42	3.04	1.38

* $p < .05$

It is important to note, however, that mean age of onset may represent diverse onset patterns and developmental trajectories. As previously discussed, early onset CD is clearly associated with a more severe and chronic prognosis compared to adolescent onset CD. Thus, distinguishing between youth with early versus late onset CD is essential to better understanding the mental health needs of this heterogeneous group of youth. In the next sections, rates of disorders and comorbidity patterns are compared across males and females with early versus late conduct disorder. At this point, analyses will include only youth who meet full DSM-IV criteria for conduct disorder (*n* = 107).

3.5 Lifetime Mental Health Profiles: Early versus Late Onset CD

Early onset CD according to the DSM-IV requires that a youth display one of the criterion before the age of 10 years old. Approximately two thirds (66%) of the youth who met full criteria for CD were “early starters” and approximately one third (34%) were “adolescent starters”. Although a greater prevalence of males (72%) compared to females (59%) showed early onset CD, this difference was not statistically significant.

Table 4 presents each lifetime disorder across CD onset subtype. There were no significant differences between each disorder across early and adolescent onset subtypes. Furthermore, there were no significant differences in CD onset for a current diagnosis of MDE, ADHD, or SDD[2].

Table 4: Lifetime Mental Health Disorders by CD Onset Subtypes

	CD Subtypes			
	Total (N=107)	Early Onset (*n*=71)	Late Onset (*n*=36)	χ^2
ADHD	80 (75%)	57 (80%)	23 (64%)	3.40
SDD	92 (86%)	60 (85%)	32 (89%)	0.38
MDE	43 (40%)	32 (45%)	11 (31%)	2.09
PTSD[a]	26 (39%)	19 (40%)	7 (37%)	0.07

[a]PTSD data was available for 66 youth (33 male, 33 female)

[2]Similar prevalence of youth with SDD had early versus late onset CD: 81% of youth with a current diagnosis of SDD had adolescent onset CD, and 82% of youth with a current diagnosis of SDD had early onset CD, χ^2 (1, N = 107) = .02, p > .05. Slightly more youth with a current diagnosis of ADHD had early onset CD (54%) rather than adolescent onset CD (44%), however, this was not a statistically significant difference, χ^2 (1, N = 107) = .79, p > .05. Again, only slightly more youth with a current episode of depression had early onset CD (27%) versus adolescent onset CD (22%), with no statistically significant difference, χ^2 (1, N = 107) = .26, p > .05.

To understand CD onset subtypes further, gender differences are displayed in Table 5 for early onset and adolescent onset CD separately. Table 5 shows that gender differences occur for youth with early onset CD but not adolescent onset CD. While rates of ADHD and SDD did not differ by gender for early or late starters, significantly more early starter females (75%) had a comorbid lifetime major depressive episode than males (27%). Furthermore, significantly more early starter CD females (57%) had experienced PTSD in their lifetime compared to males (27%). This suggests that for youth who experienced behaviour problems before age 10 years, females are more likely than males to experience co-occuring internalizing disorders (MDE and/or PTSD).

Table 5: Gender differences within CD Onset Subtypes for Individual Lifetime Mental Health Disorders

	Early Onset (n=71)				Adolescent Onset (n=36)			
	Total (*n*=71)	Male (*n*=44)	Female (*n*=27)	χ^2	Total (*n*=36)	Male (*n*=17)	Female (*n*=19)	χ^2
ADHD	57 (80%)	34 (77%)	23 (85%)	.66	23 (64%)	12 (71%)	11 (58%)	.63
SDD	60 (85%)	35 (80%)	25 (93%)	2.18	32 (89%)	14 (82%)	18 (95%)	1.39
MDE	32 (45%)	12 (27%)	20 (74%)	14.80***	11 (31%)	5 (29%)	6 (32%)	.02
PTSD[a]	19 (40%)	7 (27%)	12 (57%)	4.41*	1 (14%)	6 (50%)	7 (37%)	2.4

[a] PTSD data was available for 66 youth (33 male, 33 female)
*$p < .05$
***$p < .001$

Table 6 displays another set of chi-square analyses that examined the onset differences within the male and female categories. Early onset CD females (83%) had significantly more ADHD diagnoses than adolescent onset CD

females (58%). This is not the case for males, as both early and adolescent onset CD groups had quite similar ADHD prevalence rates (77% and 71% respectively). Females with an early onset of CD were more likely to have a lifetime major depressive episode than females with adolescent onset CD (74% and 32% respectively). Again, this is not the case for males, as a similar prevalence of a major depressive episode was seen for early (27%) and adolescent onset CD (29%) groups. There were no CD onset subtype differences for both males and females who have a substance dependence disorder or PTSD.

Table 6: CD Onset Differences within Male and Females for Individual Lifetime Mental Health Disorders

	Males (n=61)				Females (n=46)			
	Total (*n*=61)	Early Onset CD (*n*=44)	Late Onset CD (*n*=17)	χ^2	Total (*n*=46)	Early Onset CD (*n*=27)	Late Onset CD (*n*=19)	χ^2
ADHD	46 (75%)	34 (77%)	12 (71%)	.30	34 (74%)	23 (85%)	11 (58%)	4.31*
SDD	49 (80%)	35 (80%)	14 (82%)	.06	43 (94%)	25 (93%)	18 (95%)	.08
MDE	17 (30%)	12 (27%)	5 (29%)	.03	26 (57%)	20 (74%)	6 (32%)	8.20**
PTSD[a]	8 (24%)	7 (27%)	1 (14%)	.48	18 (55%)	12 (57%)	6 (37%)	.16

[a] PTSD data was available for 66 youth (33 male, 33 female)
*$p < .05$
**$p < .01$

In summary, females with early onset conduct disorder problems were more likely to have MDE or ADHD than females with adolescent conduct disorder problems. There were no differences between early onset CD and adolescent

onset CD for males with any disorder (MDE, ADHD, PTSD, or SDD), or for females with PTSD or a SDD.

3.6 Comorbidity in Youth with Conduct Disorder

The most common disorders comorbid with conduct disorder for both males and females was similar, as seen in Table 7. The order of most common additional disorders is a SDD, ADHD, MDE, and PTSD. A greater percentage of females had each additional disorder, with significantly more females having a MDE and PTSD than males.

Table 7: Conduct Disorder plus Lifetime Mental Health Disorders by Gender

	Total (*n*=107)	Males (*n*=61)	Females (*n*=46)	χ^2
CD plus ADHD	80 (75%)	46 (61%)	34 (75%)	.03
CD plus SDD	92 (86%)	49 (80%)	43 (94%)	3.76
CD plus MDE	43 (40%)	17 (28%)	26 (57%)	8.96**
CD plus PTSD[a]	26 (40%)	8 (24%)	18 (55%)	6.35*

[a]PTSD data was available for 66 youth (33 male, 33 female)
*$p < .05$
**$p < .01$

Overall, there was substantial comorbidity among both males and females in this sample as can be examined in Table 8. The majority of youth (97%) met criteria for *at least* one disorder in addition to conduct disorder, with similar rates between males and females. Furthermore, approximately three quarters (76%) of youth met criteria for *at least* two additional disorders, with similar rates between

males and females. Approximately one third (37%) of youth with conduct disorder also met criteria for *at least* three disorders, with more females (59%) having at least three additional disorders than males (21%). Furthermore, significantly more females (24%) than males (8%) met criteria for all four diagnoses (ADHD, SDD, MDE and PTSD). In regards to current comorbidity, significantly more females than males met criteria for current diagnoses of ADHD, MDE and SDD at the time of assessment[3]. This suggests females with a diagnosis of conduct disorder are more likely to have more complex mental health profiles by exhibiting more disorders than males with conduct disorder.

Table 8: Lifetime Comorbidity of youth with Conduct Disorder by Gender

CD DX and	Total (*n*=107)	Male (*n*=61)	Female (*n*= 46)	χ^2
At least 1 DX	104 (97%)	58 (95%)	46 (100%)	2.33
At least 2 DX	81 (76%)	44 (72%)	37 (80%)	.98
At least 3 DX	40 (37%)	13 (21%)	27 (59%)	15.66***
All 4 DX	16 (15%)	5 (8%)	11 (24%)	5.09*

*$p < .05$
*** $p < .001$

Table 9 examines conduct disorder onset differences by comorbidity. Significantly more youth with early onset than late onset CD had two additional mental health disorders, 82% versus 64% respectively. There were no other

[3]Nearly all youth with a lifetime diagnosis of CD had at least one current disorder (96% females, 89% males), χ^2 (1, N = 107) = 1.73, $p > .05$. Slightly more females (59%) than males (46%) had a current diagnosis of at least two disorders, however this was not a statistically significant difference, χ^2 (1, N = 107) = 1.72, $p > .05$. Significantly more females (24%) than males (7%) met criteria for all 3: MDE, ADHD and SDD, χ^2 (1, N = 107) = 6.55, $p < .05$. Note: The current comorbidity analyses do not include PTSD.

significant CD onset differences in comorbidity rates. Furthermore, there were no statistically significant differences between CD onset subtypes for current comorbidity rates in males, however, more females with CD and at least two current disorders had early onset CD rather than adolescent onset CD[4].

Table 9: Lifetime Comorbidity of youth with Conduct Disorder by CD Onset Subtypes

CD DX and	Total (*n*=107)	Early Onset (*n*=71)	Late Onset (*n*= 36)	χ^2
At least 1 DX	104 (97%)	68 (96%)	36 (100%)	1.57
At least 2 DX	81 (76%)	58 (82%)	23 (64%)	4.11*
At least 3 DX	40 (37%)	29 (41%)	11 (31%)	1.08
All 4 DX	16 (15%)	13 (18%)	3 (8%)	1.87

* $p < .05$

Tables 10 and 11 further explore CD onset and gender differences in comorbidity patterns. In Table 10, females with three additional disorders were more likely to have early onset CD than adolescent onset CD. There were no other differences between comorbidity for early versus late onset within gender categories.

[4] The same prevalence rates of current comorbidity were found for youth with at least one disorder for early onset (92%) versus adolescent onset CD (92%). Slightly more youth with early onset CD had at least two current diagnosis (56%) versus adolescent onset CD (42%); however, this was not a statistically significant difference, χ^2 (1, N = 107) = 2.06, $p > .05$. There were no CD onset differences in the prevalence rates for youth who met criteria for a current diagnosis of ADHD, MDE, and SDD; the prevalence was 14% for both CD onset subtypes.

Table 10: CD Onset Differences within Male and Females for Comorbidity

CD DX and	Males (n=61)				Females (n=46)			
	Total (*n*=61)	Early Onset CD (*n*=44)	Late Onset CD (*n*=17)	χ^2	Total (*n*=46)	Early Onset CD (*n*=27)	Late Onset CD (*n*=19)	χ^2
At least 1 DX	58 (95%)	41 (93%)	17 (100%)	1.22	46 (100%)	27 (100%)	19 (100%)	
At least 2 DX	44 (72%)	34 (77%)	10 (59%)	2.08	37 (80%)	24 (89%)	13 (68%)	3.0
At least 3DX	13 (21%)	9 (20%)	4 (24%)	.07	27 (59%)	20 (74%)	7 (37%)	6.38*
All 4DX	5 (8%)	4 (9%)	1 (6%)	.17	11 (24%)	9 (33%)	2 (11%)	3.19

*$p < .05$

Finally, an analysis of gender differences within each CD onset subtypes is displayed in Table 11. For youth with early onset CD, more females than males had at least 3 or 4 mental health disorders. There were no other gender differences found in youth with late onset CD, or with females who had at least 1 or 2 disorders.

Table 11: Gender Differences within CD Onset Subtypes for Comorbidity

CD DX and	Early Onset CD (n=71)				Late Onset CD (n=36)			
	Total (n=71)	Male (n=44)	Female (n=27)	χ^2	Total (n=36)	Male (n=17)	Female (n=19)	χ^2
At least 1 DX	68 (96%)	41 (93%)	27 (100%)	1.92	36 (100%)	17 (100%)	19 (100%)	
At least 2 DX	58 (82%)	34 (77%)	24 (89%)	1.51	23 (64%)	10 (59%)	13 (68%)	.36
At least 3 DX	29 (41%)	9 (44%)	20 (74%)	19.91***	11 (31%)	4 (24%)	7 (37%)	.75
All 4 DX	13 (18%)	4 (9%)	9 (33%)	6.57*	3 (8%)	1 (6%)	2 (11%)	.25

*$p < .05$
*** $p < .001$

4: DISCUSSION

This study examined the mental health profiles of adolescent girls and boys with serious behaviour disorders, who were recruited from either a mental health or juvenile justice facility. The purpose of the current study was to discover differences in mental health profiles by conduct disorder subtype (childhood versus adolescent onset), gender and comorbidity. This study was a part of a larger longitudinal study examining gender and aggression, with one of the largest samples of female youth with behaviour disorders. Overall, the high prevalence rates of lifetime and current disorders as well as high comorbidity rates found in this study highlight the complex mental health needs of youth with serious behaviour disorders. In addition to a diagnosis of conduct disorder, youth in the study exhibited high prevalence rates of internalizing disorders (major depressive episode and PTSD), externalizing disorders (ADHD) and substance dependence disorders.

4.1 Gender Differences in the Mental Health Profiles of Youth with Behaviour Problems

4.1.1 Major Depressive Episode

As predicted, females experienced significantly more current and lifetime internalizing disorders (major depressive episode and PTSD) than males. Females were approximately twice as likely as males to experience an episode of major depression in their lifetime (49% versus 25% respectively) as well as

currently (32% versus 17% respectively). This is consistent with the review conducted by Fazel et al. (2008) on mental disorders among adolescents in juvenile facilities. Fazel et al. found that girls were more often diagnosed with major depression than were boys (29.2% versus 11.7%). This difference is quite striking in light of the fact that a recent meta-analysis on adolescent depression suggests there are only modest gender differences in the general population (Costello, Erkanli, & Angold, 2006).

When examining youth who had a comorbid lifetime major depressive episode with conduct disorder in the current sample, gender differences also emerged; the rates of CD and MDE was nearly double for girls compared to boys (57% versus 28% respectively). This is not surprising given that comorbidity of CD and depression has been previously described as occurring at greater than chance rates in both community and clinic referred samples (Angold, & Costello, 1993; Greene et al., 2002; Wolff & Ollendick, 2006). A research review of comorbidity between conduct problems and depression conducted by Wolff and Ollendick (2006) reported that there is no clear consensus about the order that depression and conduct problems emerge in the literature. The current study would suggest that in this high-risk sample of youth, behaviour problems and depressive problems *both* started in pre-adolescence at around 11-12 years of age, with only slight age of onset differences. Overall, the mean age of onset for conduct disorder (11.43 years) was only slightly younger than the mean age of onset for depressive symptoms (11.84 years).

The high rates of depression and CD in this sample is concerning because of the associated increased rates of suicidal behaviour, poorer prognosis into adulthood and higher treatment utilization, compared to youth with either depression or CD alone.

Capaldi (1991, 1992) found that the risk for suicidality increases in depressed adolescents when youth had pre-existing conduct problems. Furthermore, Lewinsohn, Rohde, and Seeley (1995) examined comorbidity and associated clinical features in a sample of 1507 adolescents from the community, and found that the presence of depression plus disruptive behaviours substantially increased the suicide attempt rate compared to youth with a single disorder. It also appears that females with this combination of disorders have more suicidal thoughts and behaviours than males with CD and depression. A more recent study by Lehto-Salo, Närhi, Ahonen, and Marttunen (2009) conducted in Finland found that girls with CD had higher rates of comorbid internalizing disorders than boys. This was also accompanied by significantly more suicidal ideation and previous suicide attempts for girls than boys with behavioural disorders. Perhaps the high rate of suicidal behaviour in youth with CD and depression is caused by these youth to more likely to act out behaviourally (towards themselves and others) in an effort to cope with their depression.

There is also evidence that youth with depression and CD have difficulties that persist into adulthood which could include involvement with crime. Copeland, Miller-Johnson, Keeler, Angold, and Costello (2007) examined psychopathology

in childhood and adolescence and then examined their criminal record at ages 16 to 21 as part of the Great Smokey Mountains Study. They found that severe/violent offender status was predicted by comorbid profiles including various combinations of internalizing disorders (depression and anxiety), substance use disorders, and conduct problems. This is concerning as it shows a relationship between severe/violent crimes and youth with specific comorbid disorders.

In addition to having poorer prognosis into adulthood, it is not surprising that youth with CD and depression utilize more services as adults. The Maudsley long term follow-up conducted in London, England followed youth into adulthood who had either depression alone or comorbid depression and conduct disorder (Knapp, McCrone, Fombonne, Beecham, & Wostear, 2002). Knapp et al. found that youth with comorbid conduct disorder and depression have higher service utilization in adulthood compared to the general population and those with a diagnosis of only depression in childhood. Furthermore, the cost of criminal justice services for youth with comorbid conduct disorder and depression were more substantial compared with depression alone. Early prevention and intervention in childhood and adolescence would substantially decrease public service costs in adulthood as it appears the needs of youth with comorbid depression and conduct disorder continue into adulthood.

In summary, the fact that significantly more females than males have comorbid CD and MDE suggests they are at more risk for severe impairment,

which could include suicidal behaviour, continued crime into adulthood and more dependence on public services.

4.1.2 Posttraumatic Stress Disorder

The rate of lifetime PTSD in the sample was substantial; half of the females and 20% of the males in the sample experienced PTSD, which was a statistically significant difference. This is quite a bit higher than previous studies (e.g. Wasserman et al., 2005). Furthermore, previous studies found mixed results in relation to gender differences in PTSD. Wasserman et al. did not find gender differences in rates of PTSD, whereas Cauffman et al. (1998) did find gender differences, with more females than males experiencing PTSD.

The high rates of PTSD in this sample exemplifies the high risk nature of youth with behavioural disorders, as they are often exposed to violence and childhood abuse. Wood, Foy, Layne, Pynoos, and James (2002) reported that females are at particular risk for the development of PTSD because of their repeated exposure to direct, interpersonal traumas. More recently, Kerig, Ward, Vanderzee, and Moeddel (2009) found that PTSD mediates the relationship between interpersonal trauma and mental health problems for both males and females, with a stronger association found in females. This suggests that the trauma these youth experience could play a significant role in the development of subsequent behaviour and emotional difficulties if left untreated. If the causes of the behaviour are understood, treatment providers would be in a better position to meet the needs of these vulnerable youth. If treatment is not sensitive to the

childhood abuse and violence many of these youth were exposed to, they may be at higher risk for continued psychopathology (Anda et al., 2006).

4.1.3 ADHD

Approximately two thirds of youth had a lifetime ADHD diagnosis and less than half (43%) met criteria for ADHD currently. The rates of lifetime ADHD were much higher in both girls and boys in this sample compared to previous studies of incarcerated youth (Fazel et al., 2008; Wasserman et al., 2005). A review of studies examining mental health disorders in incarcerated juveniles summarized the overall prevalence rates for ADHD were approximately 20-30% (Odgers et al., 2005). These studies are based on currently meeting criteria for ADHD, whereas this study was able to examine current and lifetime diagnostic profiles; therefore, the prevalence of currently meeting ADHD (43%) is comparable to previous studies.

Contrary to predictions of this study as well as previous research (Clarizio, 1997; Moffit et al., 2001), the prevalence of ADHD was not significantly higher for boys than girls. The lack of gender difference for youth with ADHD is surprising given the fact that in the community, the prevalence of ADHD is higher in males than females (Waddell et al., 2002). Based on the gender paradox theory, previous theories have thought that females with ADHD and CD are more severely impaired than males with similar diagnoses (Clarizio, 1997). Therefore, females with both ADHD and CD should be concerning for clinicians because of the lower base rates of ADHD and CD found in the community. Regardless of the gender differences, the high prevalence of ADHD diagnoses in both males and

females is important as previous research states that the combination of ADHD and CD might cause more aggressive behaviour in offenses (Babinski et al., 1999).

4.1.4 Substance Dependence Disorders

In the current study the most common disorder above and beyond a diagnosis of CD was a substance dependence disorder. Just less than three quarters of the youth had a lifetime or current substance dependence disorder. Odgers et al. (2005) summarized the research in this area and concluded that approximately half of both males and females met criteria for a substance dependence disorder. Although this does seem to be the consensus in the literature, there are some studies that found much higher prevalence rates of SDD. For example, Karnik et al. (2009) interviewed 790 male and female adolescents while they were incarcerated for at least nine months and reported that over 80% of them met criteria for some type of current substance use disorder.

Considerable evidence points to the direct link between substance use and violence (e.g. Lennings, Copeland, & Howard, 2003). It has been suggested that there are three ways in which this relationship might exist 1) the effects of the substance directly facilitate violent crimes, 2) in order to support the substance dependency, crimes are committed, and 3) crimes are related to drug dealing and the violent acts sometimes associated with this process. Furthermore, evidence suggests that youth who are diagnosed with a substance use disorder before the age of 16 are four times more likely to be incarcerated in

connection with a substance related offense as adults (Slade et al., 2008). In the current study, the mean age of first substance dependence symptom was slightly lower for females than males (12.93 years versus 13.44 years respectively). This is concerning because the age of onset is in the pre adolescent age period right before high school which means they are disengaging from the prosocial school system and more likely to be involved in criminal behaviour. Additionally, early adolescence is a period of rapid neurological development (Blakemore, & Choudhury, 2006), and thus substance use during this period can significantly impair cognitive development during this critical period (Chambers, Taylor, & Potenza, 2003).

The consequences of early drug and alcohol use can be long lasting with documented implications for healthy physical, social, cognitive, and emotional development in young people. For example, individuals with early onset and long standing substance use problems are less likely to complete high school, hold a job or maintain meaningful relationships. Further, prolonged substance use is directly linked to a variety of physical health problems, which may result in further debilitating effects in everyday functioning. Thus, treating high-risk youth early has multiple benefits to the adult mental health system, adult justice system, not to mention the victims of their crimes. Furthermore, early prevention and intervention with regards to substance use would facilitate an easier transition into adulthood for these youth.

4.2 CD Onset and Gender Differences in the Mental Health Profiles of Youth with Behavior Problems

Approximately two thirds of youth who met full DSM-IV criteria for conduct disorder had childhood onset subtype. In other words, of the youth who met criteria for CD, two thirds of these youth had at least one of the 15 possible criteria present before 10 years of age. Although the prevalence rate of childhood onset subtype was higher for males (72%) than females (59%), this difference was not statistically significant. This is contrary to previous studies, where the consensus was that childhood onset CD was less prevalent for girls than boys (Moffitt et al., 2001; Silverthorn et al., 2001). Because of the apparent differences in the trajectory of CD in females and males researchers in the past, including Silverthorn et al. (2001), have proposed a "delayed onset" subtype for girls which starts in adolescence and has similar impairment and trajectory to childhood onset subtype in boys. However, this does not seem to be supported here and a subsequent review of the CD onset literature has caused Moffitt and colleagues (2008) to reject the proposal of a delayed onset subtype in females. The results in the current study are similar to research conducted by McCabe et al. (2004), where they studied youth in the public sector with CD and found that approximately half of the females and two thirds of the males had childhood onset CD.

The current study also found no statistically significant differences in the rates of individual mental health diagnoses for early versus late onset subtypes of CD when gender was collapsed. These results do not support the study's predictions that early onset CD youth would have higher rates of mental health

disorders than youth with adolescent onset CD. This hypothesis was based on previous research findings that indicated youth with early onset CD have more severe impairment, and thus perhaps more mental health needs overall. However, when gender is collapsed for individual disorder prevalence rates, this hypothesis does not appear to be substantiated. Perhaps there are no differences in early versus late onset CD by individual disorder, because there was substantial mental health needs found for *both* the youth with early and late onset CD.

However, when the sample was split by gender, CD onset differences did emerge for individual mental health disorders. Interestingly, CD onset differences for individual mental health disorders were present within female participants and not for male participants. For females with ADHD or MDE, significantly more of these youth had childhood onset than adolescent onset CD. This finding is consistent with the hypothesis that more severe impairment (indicated by the presence of mental health disorders) would be present for youth with early onset as opposed to late onset CD. This is consistent with previous research (Conner et al., 2007) that indicates that ADHD is more prevalent with early onset CD than adolescent onset CD. However, Connors et al. study was predominately male, and included only 6 female participants. The current research study expands on Connors et al. research by providing evidence that ADHD and MDE are associated with early onset CD in females. The fact that this association was not present for males in the current study is surprising and is not consistent with

predictions. It appears that mental health profiles were similar in males, regardless of CD age of onset.

Further analyses were conducted to determine if gender differences existed between individual rates of mental health disorders, within the childhood and adolescent onset CD subtypes. Within the childhood onset CD youth, more females than males met criteria for lifetime MDE and PTSD. This suggests that the gender difference for internalizing disorders occurs for youth with early onset CD and not for adolescent onset CD. This finding merely suggests that the gender difference occurs for youth with early behaviour problems, but not necessarily that they have internalizing disorder in childhood, just at some point in their life. Gender differences were not found in childhood onset CD for SDD or ADHD, nor were gender differences present within adolescent onset subtypes youth for any of the rates of individual mental health disorders. The lack of gender difference within the onset categories for ADHD and SDD is consistent with the previous finding that when CD onset subtypes are collapsed, no gender differences were found for youth with ADHD or SDD.

Recently, Moffitt et al. (2008) provided a comprehensive review of research needs for the upcoming DSM-V conduct disorder diagnosis. In this review paper, Moffitt et al. questions whether or not the DSM-IV subtyping should be retained for the DSM-V, or if there should be an update. Moffitt concluded that there are consistent enough findings that the subtypes are characterized by distinct problems, course and prognosis for both boys and girls. Therefore, the paper concluded that it is worthwhile to make the distinction between childhood

and adolescent onset diagnoses because youth could require different interventions depending on the onset.

However, Moffitt et al.'s review also suggest the inclusion of a *childhood-limited CD* subtype*,* which is a group of youth who exhibit disruptive behaviour as young children, but their antisocial tendencies do not persist into adulthood. However, some studies suggest that although antisocial behaviours decline, youth with childhood-limited CD, still have significant impairment in adulthood, which includes internalizing disorders, social isolation, and being financially dependent on others (Moffitt, Caspi, Harrington, & Milne, 2002; Wiesner, Kim, Capaldi, 2005). It seems that understanding the differences between childhood-limited and lifecourse persistent CD would help predict varying developmental trajectories and associated needs of the CD subtypes. Unfortunately, the current study does not take into account whether or not the youth with childhood onset CD are childhood limited or lifecourse persistent. Fortunately, this information will be possible to test in the future, as the youth in this study continue to be assessed as they transition into adulthood. If the higher risk, lifecourse persistent CD subtype youth could be identified in childhood, more intensive treatment could be provided in an effort to prevent such a negative prognosis into adulthood. To date, previous studies have not been able to identify risk factors that distinguish these two types of conduct disordered youth (Moffitt, 2003, 2006). Moffitt describes that this research is needed, and suggests that comorbid mental health diagnoses might be an example of the type of research that could help differentiate these subtypes.

4.3 Comorbidity: Gender and CD Onset Differences

There was substantial comorbidity in this sample; nearly all of the youth (97%) with conduct disorder had at least one additional disorder at one point in their life. Furthermore, approximately three quarters (76%) of the youth with conduct disorder had at least two lifetime mental health disorders. Gender differences were present for youth with conduct disorder and at least three additional disorders; more girls than boys had conduct disorder plus at least three mental health disorders. There were no gender differences for the seven youth who met criteria for all 5 disorders (CD, ADHD, MDE, PTSD and SDD). The finding that more girls had three or more additional disorders than boys, suggests that females have more complex mental health needs. The higher comorbidity in females is apparent because of the higher rates of internalizing disorders (MDE and PTSD) compared to males.

The current study further examined the onset differences within male and female participants for comorbidity rates. For females with at least 3 additional disorders, significantly more had early onset than adolescent onset conduct disorder. Again, this is consistent with the previous findings that more females with ADHD and MDE had early onset CD versus adolescent onset CD. This finding suggests that early starter conduct disorder in females is in fact accompanied by greater impairment caused by high comorbidity rates. This finding is only present for females with conduct disorder and at least three disorders.

The current study found that more youth with early starter conduct disorder versus late starter conduct disorder had at least two additional disorders when gender was collapsed. However, there were no statistically significant onset differences between comorbidity rates for youth with at least 1 disorder, at least 3 disorders or all 4 additional disorders above and beyond conduct disorder. This is only moderately in line with the prediction that more youth with early starter conduct disorder have higher comorbidity rates than youth with adolescent onset conduct disorder. Further analyses were conducted, to examine gender differences within the onset categories. Significantly more females than males had at least 3 or 4 additional disorders within the early onset CD category.

In summary, the gender and onset differences for comorbidity were not consistent overall. The findings suggest that more females than males have higher comorbidity rates (additional 3 disorders), which is a result of the higher rates of MDE and PTSD found in females. Within the female participants with at least 3 additional disorders, significantly more of them had early versus late onset CD. However, when examining onset differences with genders collapsed, more youth had early starter CD in the comorbidity category of at least 2 additional disorders. Overall, the gender and onset differences varied at the level of comorbidity. However when differences were apparent it was consistent in the following pattern; females had higher comorbidity than males and there was higher comorbidity found in early onset CD compared to adolescent onset CD.

The higher comorbidity in females and youth with early onset CD is quite concerning due to the associated poorer prognosis of youth with multiple disorders. For example, Lewinsohn et al. (1995) examined comorbidity and associated clinical features in a sample of 1507 adolescents from the community and found that academic problems increased substantially with each additional mental health disorder. More specifically, they found almost half of youth with three disorders showed evidence of serious academic difficulties. There is also some evidence that mental health disorders in addition to conduct disorder in adolescence is associated with adult offending. Copeland et al. (2007) found that adolescents with psychiatric disorders in addition to CD, were twice as likely to be involved in the criminal justice system as young adults compared to adults with no childhood disorders. This suggests that lifetime mental health disorders in youth could be an important factor involved in the pathway to adult offending. When this information is applied to the current study, is suggests that females and youth with early starter CD might be at higher risk for poorer prognosis into adulthood because of their higher rates of multiple disorders.

4.4 Policy Implications

The results of this study suggest that youth with serious behaviour problems experience high rates of mental health disorders and consequently have complicated treatment needs. Recently there have been several studies that discuss conduct disorder in childhood and adolescence as an “opportunity for prevention” (e.g. Harley, Murtagh, & Cannon, 2008). By the time adulthood is reached intervention becomes increasingly more difficult as there often is already

a long history of conduct disorder, a criminal record, and perhaps even the development or persistence of a severe mental illness. Thus, there is a consensus among researchers that treating these youth in childhood and adolescence is more cost-effective and important to redirect a potentially chronic course of impairment (Foster & Jones, 2005; Waddell, Lomas, Offord, & Giacomini, 2001). In Canada, there is much evidence that shows that these youth require prevention and intervention when younger, however, this evidence does not seem to be used in decision making at the policy level, because of competing influences on the policy process (Waddell et al., 2005).

With the knowledge that behaviourally disordered youth have complex mental health needs, treatment and service utilization is imperative to decrease later aggression and delinquency. Unfortunately, there exists a significant disparity between children who *need* mental health care services and those who actually *utilize* services (Leaf et al., 1996; Offord et al., 1987). The next phase of this program of research will be to understand how these youth utilized services and to understand their barriers to care.

4.5 Limitations

The limitations of the current study's methodology should be taken into account when interpreting the results. First of all, it is important to note that the comorbidity data in this research does not specify if these youth experienced the mental health disorders at the same time. Lifetime mental health disorders were chosen as the focus for onset and comorbidity analyses because of the interest in overall needs and age of emerging difficulties. Although this is seen as a

strength of the study, as it provides valuable information about a high risk sample's lifetime needs relevant for intervention, it makes it difficult to compare previous studies prevalence rates which were predominately current rates. Therefore, the current study's prevalence rates for each disorder tended to be quite high in comparison to other studies data, in particular ADHD prevalence rates, as ADHD tends to decrease over time as youth age.

Secondly, there were fewer youth with data on PTSD because of study methodology inconsistency around measuring PTSD with two different measures (DICA-R or CAPS). However, both tools are valid measures of the presence of PTSD and both mapped onto the DSM-IV criteria and therefore still report valid and reliable rates.

In this study, the measure of depression was experiencing a major depressive episode as opposed to major depressive disorder. This decision was made in order to stay consistent with previous studies reports of depression (Abram et al., 2003). Furthermore, it was deemed relevant to understand the needs these youth have experienced throughout their lives, and because a major depressive episode is thought of as impairing, MDE was reported as opposed to full MDD criteria. However, some of the research on depression and the poorer prognosis for youth with CD and depression used MDD as a measure of depression and therefore some of the information might not be comparable to the youth who experienced a major depressive episode and not necessarily multiple episodes.

Although this study described gender differences in the rates of mental health disorders, a more detailed theoretical discussion of why these gender differences existed was not discussed. Future research should examine the reasons for the gender differences with a more theoretical discussion of potential biological and social causes. Also, a more thorough discussion of early prevention for at risk children was not discussed in this study, and therefore strategies for targeting at risk families is an important area for future research studies to continue to explore.

Finally, the chi-square analyses in Tables 5, 6, 10 and 11 involved subgroups of the original sample size. For example, there were only 36 youth who met criteria for adolescent onset CD; therefore, in order to examine gender differences there is not sufficient power to detect medium or small effect sizes at an alpha of .05. According to Cohen (1992), in order to detect small or medium effect sizes, either 87 or 785 participants would be required. This means that the chi-square analyses that examined gender differences within CD onset subtypes and onset differences within gender subtypes, only had sufficient sample sizes to detect large effect sizes, which is 26 (Cohen, 1992).

5: CONCLUSION

In this study, youth with serious behaviour problems had substantial additional mental health disorders. Approximately three quarters of youth had two additional disorders above and beyond their diagnosis of conduct disorder. Although the results were not consistent, overall there was a pattern that youth with early onset CD and females were more likely to have higher comorbidity rates than boys and adolescent onset CD. Girls and boys had similar rates of lifetime conduct disorder, substance dependence disorders, and ADHD. However, significantly more girls than boys experienced a lifetime internalizing disorder (major depressive episode or PTSD).

The high rates of disorder in this sample highlights the complex needs youth with serious behaviour problems have. These problems started on average in pre-adolescence and thus treatments should be geared towards treating youth in this vulnerable stage of development. Two thirds of the youth who met criteria for conduct disorder were “early starters”. Future research is needed in this area to understand if mental health profiles can predict childhood limited versus lifecourse persistent conduct disorder subtypes. Treating the mental health needs early has the potential to derail a very destructive pathway that youth with behaviour problems can follow. This study outlined the needs of a very high risk population of youth, however more research is needed on how the public health sector attempted to meet these needs. Therefore in order to build on this

research, future research should examine the service utilization patterns of this sample.

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