SEPARATION ANXIETY DISORDER AND OPPOSITIONAL DEFIANT DISORDER: PERCEIVED COMORBIDITY BETWEEN DISORDERS RESULTING FROM AMBIGUOUS ITEMS AND HALO EFFECTS

by

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Abstract

Although theoretical arguments would suggest little comorbidity between Separation Anxiety Disorder (SAD) and Oppositional Defiant Disorder (ODD), epidemiological studies find otherwise. I examined whether ambiguous symptoms and negative halo effects contribute to this comorbidity. In Study 1, 72 mothers read scenarios of children displaying either SAD or ODD behaviors. The SAD scenarios included behaviors considered by judges to be pure exemplars of SAD, as well as behaviors considered to be ambiguous representations of the disorder. ODD scenarios also included both pure and ambiguous behaviors. After each scenario, mothers rated the child on the behaviors presented in the scenario, as well as behaviors of the alternate disorder, and somatic symptoms. Mothers endorsed the ambiguous behaviors presented in the scenarios significantly less than the pure behaviors; and rated the ambiguous behaviors of the non-presented disorder significantly more often than the pure behaviors of the non-presented disorder. This suggests that some comorbidity between SAD and ODD may be explained by the presence of ambiguous items representing the two disorders. For the SAD scenarios, mothers also endorsed non-presented somatic symptoms, suggesting a general negative halo bias in maternal ratings of anxious children. Study 2 used a clinical sample of parents ($N = 201$) and youth ($N = 177$) and examined whether using only nonambiguous, or pure, items from commonly used rating scales would decrease the degree of relatedness between SAD and ODD symptoms. Pure anxiety and oppositional scales were created from the Child Behavior Checklist (CBCL) and Youth Self-Report (YSR). In general, the relationship between these pure scales was compared to the relationship between the commonly used, empirically-derived and DSM-oriented scales.
assessing anxiety and oppositionality on the CBCL and YSR. The pure scales were significantly less related than the empirical or DSM-oriented scales. Thus, the relatedness of the disorders was decreased by assessing only pure exemplars. In sum, the results of these studies suggest that the comorbidity of SAD and ODD observed in epidemiological studies may be partially due to the inclusion of ambiguous items on commonly used rating scales. Implications for clinical assessment and theory are discussed.
Table of Contents

Abstract .......................................................................................................................... ii
Table of Contents ........................................................................................................ iv
List of Tables ................................................................................................................ vi
Acknowledgement ........................................................................................................ viii

CHAPTER I – Introduction .......................................................................................... 1
1.1 Separation Anxiety Disorder ............................................................................. 8
1.2 Oppositional Defiant Disorder ......................................................................... 9
1.3 Genetic Contribution to Anxiety and Oppositional Behaviors .................. 11
1.4 Biological Theories of Anxiety and Oppositional Behaviors .................... 14
  1.4.1 Behavioral inhibition and activation systems ........................................ 14
  1.4.2 The HPA axis and the fearlessness theory ........................................... 18
1.5 Parenting Practices as an Environmental Risk Factor for Anxiety and Oppositional Defiant Disorders ............................................................................. 20
1.6 Comorbidity ....................................................................................................... 23
1.7 Substantive Explanations for Comorbidity ..................................................... 26
1.8 Methodological Explanations for Comorbidity ............................................. 28
1.9 The Present Study ............................................................................................... 31

CHAPTER II – Experiment 1 ..................................................................................... 35
2.1 Method .................................................................................................................. 35
  2.1.1 Participants ............................................................................................... 35
  2.1.2 Procedure .................................................................................................. 36
  2.1.3 Scenarios and Ratings ............................................................................. 37
  2.1.4 Brief Symptom Inventory ....................................................................... 41
  2.1.5 Child Behavior Checklist ....................................................................... 42
2.2 Results .................................................................................................................. 43
  2.2.1 Data Inspection ......................................................................................... 43
  2.2.2 Order Effects ........................................................................................... 44
  2.2.3 Child Gender Effects .............................................................................. 45
  2.2.4 Correlations Between Ratings of Behaviors in the Scenarios, Child Age, Maternal Age, and Socioeconomic Status ...................................................... 46
  2.2.5 Correlations Between Ratings of Behavior Categories in the Scenarios and the BSI ................................................................. 46
  2.2.6 Correlation Between Ratings of Behavior Categories in the Scenarios and the CBCL ................................................................. 47
  2.2.7 Differences Among Ratings of the Behavior Categories for the SAD Scenarios ................................................................. 47
2.2.8 Differences Among Ratings of the Behavior Categories for the ODD Scenarios
2.2.9 Exploratory Analyses of Differences in Ratings Between SAD and ODD Scenarios

2.3 Discussion

CHAPTER III - Experiment 2

3.1 Method
3.1.1 Participants
3.1.2 Procedure
3.1.3 Child Behavior Checklist
3.1.4 Youth Self Report
3.1.5 Child Behavior Measures

3.2 Results
3.2.1 Data Inspection
3.2.2 Child Gender Effects
3.2.3 Correlations Between Ratings on the CBCL and YSR and Child Age and Socioeconomic Status
3.2.4 Correlations Between Parent Ratings of Anxious and Aggressive Behaviors
3.2.5 Correlations Between Youth Ratings of the Anxious and Aggressive Behaviors
3.2.6 Correlations Between Youth Ratings of the Anxious and Aggressive Behaviors by Gender
3.2.7 Accounting for the Lower Reliability of the Pure Anxiety Item Scales
3.2.8 Parent and Youth Cross-Informant Agreement on Scale Scores

3.3 Discussion

CHAPTER IV - General Discussion and Conclusions

4.1 Influence of Ambiguous Items and Negative Halo Effects
4.2 Parent and Youth Ratings
4.3 Gender Issues
4.4 Implications
4.5 Limitations
4.6 Conclusion

Bibliography

Appendix I - Scenario Examples
Appendix II - UBC Research Ethics Board Certificates of Approval
List of Tables

Table 1. Calculating a Sample Joint Odds Ratio .................................................. 92
Table 2. Item Make Up of the Four Behavioral Categories .................................. 93
Table 3. Internal Consistencies for Mothers’ Ratings of Items in the Behavior ...... 95
   Categories in each Scenario Type
Table 4. Descriptive Statistics for Study 1 Separation Anxiety Disorder Scenarios.... 96
   Behavior Category Ratings
Table 5. Descriptive Statistics for Study 1 Oppositional Defiant Disorder Scenarios... 97
   Behavior Category Ratings
Table 6. Descriptive Statistics for Study 1 Control Measures ................................ 98
Table 7. Correlations between the Behavioral Category Ratings for each Scenario.... 99
   Type and Socioeconomic Status and Child Age
Table 8. Correlations between the Ratings of the Behavioral Categories in each..... 100
   Scenario Type and the BSI
Table 9. Correlations between the Ratings of the Behavioral Categories in each..... 101
   Scenario Type and the Child Behavior Checklist
Table 10. Internal Consistencies for the Pure Item Scales .................................... 102
Table 11. Descriptive Statistics for Study 2 .......................................................... 103
Table 12. Correlations for the CBCL Scales and for the Scores Created by the...... 104
   Pure Items
Table 13. Correlations for the YSR Scales and for the Scores Created by the....... 105
   Pure Items
Table 14. Correlations for the YSR Scales and for the Scores Created by the....... 106
   Pure Items Separated by Gender
Table 15. Internal Consistencies and Correlations with the CBCL Aggression....... 107
   and ODD Scales for Scales Constructed with Random Samples of
   Four Items from the CBCL Anxiety/Depression Scale
Table 16. Internal Consistencies and Correlations with the YSR Aggression....... 108
   and ODD Scales for Scales Constructed with Random Samples of
   Four Items from the YSR Anxiety/Depression Scale
Table 17. Parent and Youth Cross-Informant Agreement on Scale Scores
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Chapter I - Introduction

Within the next half decade it is likely that the current Diagnostic and Statistical Manual of Mental Disorders (DSM 4th ed. Text Revision; American Psychiatric Association; APA, 2000) will be revised. The nature of this revision, however, is far from certain. There is currently some disagreement in terms of whether to tighten diagnostic criteria in the face of public skepticism or to broaden categories to allow the diagnosis of mild disorders and prodromes (Link, 2002). A third possibility that has been recommended comes from emerging research and suggests that a focus be placed on more developmentally – and theoretically – based assessment for some disorders, as this may provide a more sensitive assessment than the DSM-IV TR criteria itself, particularly among childhood disorders (Weems & Stickle, 2005). But why is diagnosis so important?

Psychiatric disorders often prevent children and adolescents from reaching their full potential by disrupting their development, impacting on their immediate environments, such as the family or school, and influencing their ability to form stable social relationships (Ford, Goodman, & Meltzer, 2003). Because of this, the ability to accurately detect and treat these problems is important if we are to relieve current distress, improve potential functioning in adulthood, and reduce the likelihood of the perpetuation of some of these problems into the next generation (e.g., children learning anxious behaviors through modeling by their anxious parents [Bandura & Walters, 1963]).

The DSM-IV TR diagnoses of the various mental health disorders are primarily descriptive; emphasizing observed or reported symptoms rather than underlying causal mechanisms. However, unlike adults, many of whom are able to present themselves to
mental health professionals and to describe their experiences and distress, young children are typically not able to either self-refer or to communicate effectively about their problems because they lack the necessary cognitive or language skills. For these reasons, clinicians often rely on reports by parents and teachers when diagnosing childhood disorders, whether these reports are based on observed behaviors (e.g., fighting, crying, etc.) or on parental inferences of more internalized symptoms the child might be experiencing (e.g., feelings of guilt, nervousness, etc.; Weems & Stickle, 2005). However, this reliance on adult reports can complicate the diagnostic process due to poor agreement between parents, teachers, and clinicians, the possibility of some child behaviors influencing the ability of parents and teachers to recall or rate other behaviors, referred to as halo effects; or the possibility that some symptom criteria may occur as characteristics of more than one disorder depending on the context under which the behaviors occur.

Co-occurring or comorbid psychiatric disorders (I will use these two terms interchangeably to refer to two or more diagnoses within individuals) further complicate the study of childhood psychiatric disorders. Two or more co-occurring disorders have been associated with greater overall impairment, as well as signaling poorer response to treatment and worse longitudinal trajectories (Beyers & Loeber, 2003). However, as Jensen (2003) noted, much of the child psychopathology research over the last decade has not addressed the issue of comorbidity satisfactorily, and has fallen short on three broad fronts. First, in many studies children with co-occurring disorders have been excluded, the exception being epidemiological surveys. This has likely reduced the applicability of these studies’ results to children seen in mental health settings who often present with
two or more co-occurring disorders. Second, even when children with co-occurring disorders have been included in studies, the methodological issues (such as the influence of using parent and teacher ratings versus clinical interviews) pertaining to definitions of comorbidity have remained unexplored, leading to inexplicable and/or discrepant findings across studies. Third, characteristics, correlates, and outcomes of co-occurring disorders have only rarely been described in previous studies, leaving readers uncertain as to whether a disorder, when accompanied by one or more others, is still essentially the same thing as the pure form of the disorder. In the absence of studies that address these issues, the questions regarding whether comorbid versus pure forms of disorders have different etiologies, clinical characteristics, or outcomes, and/or whether they will require different prevention and treatment strategies will likely remain. This dissertation will examine two of the most common childhood disorders: separation anxiety disorder (SAD) and oppositional defiant disorder (ODD), and the issues surrounding the comorbidity between these two disorders.

The scientific understanding of childhood disorders is largely a function of the ability to identify, classify, and measure these phenomena with reliability and validity. Major advances in understanding and treating childhood anxiety disorders, such as SAD, have resulted from utilizing the taxonomy provided by the DSM-IV TR (Weems & Stickle, 2005). However, several issues remain regarding the utility of the current DSM criteria for childhood anxiety disorders, such as: questions concerning where temperament and personality characteristics end and disorders begin (Hudson & Rapee, 2004; Rapee & Spence, 2004), poor discriminant and predictive ability (Ford et al., 2003), poor agreement among reporters of the symptoms (Weems & Stickle, 2005), and
high rates of comorbidity with other disorders, especially when parents and teachers are asked to rate the child’s behavior (Weems & Stickle, 2005).

In terms of ODD, similar issues arise. Several studies have looked at the developmental patterns of antisocial behavior and have suggested that adult psychopathy may be present starting in childhood, expressed as ODD and conduct disorder (CD) (Holmes, Slaughter, & Kashani, 2001; Lahey, McBurnett, & Loeber, 2000; Olvera, Semrud-Clikeman, Pliszka, & O’Donnell, 2005). In these cases, early identification before such behaviors become more entrenched may prove important for treatment attempts, as temperamental styles often associated with ODD and CD can impair the development of the affective components of conscience (Blair, 1999; Bricker, Davis, & Squires, 2004; Frick, Cornell, Bodin et al., 2003; Frick, Barry, & Bodin, 2000). However, these temperament styles raise concerns similar to those raised for anxiety disorders, namely that there are difficulties in distinguishing the differences among temperament, personality characteristics, and mental disorder (Keenan, Loeber, & Green, 1999). Additionally, other problems exist with parent and teacher reports of child behaviors, such as when a focus on disruptive behaviors influences the ability of parents and teachers to recall or rate other behaviors, often referred to as negative halo effects (Jackson & King, 2004). For example, parent or teacher experiences with children who exhibit disruptive behaviors, and the expectancies derived from these experiences, have been shown to artificially inflate ratings of hyperactivity and inattentiveness for children diagnosed exclusively with ODD (Jackson & King, 2004). The results of this negative halo effect, then, are that parents’ and teachers’ ratings of child behavior can be colored by the expectation of what other behaviors may accompany those that are observed. This
effect may have influenced epidemiological studies that found children with an anxiety disorder to be at increased risk of having a co-occurring disruptive behavior disorder, and vice versa (Ford et al., 2003), by increasing the likelihood of parents and teachers inflating ratings of behaviors of one disorder based on their past experience with another disorder.

As already noted, parents’ and teachers’ reports of child behavior are an integral part of the diagnosis of childhood disorders, but have numerous problems including an average agreement among youth, parents, teachers, and clinicians about the presence of a given behavior of only approximately \( r = .25 \) (Achenbach, McConaughy, & Howell, 1987), and the potential influence of negative halo effects on raters’ perceptions of other behaviors. In addition to these problems, some symptom criteria that parents are asked to rate may occur as characteristics of more than one disorder, albeit the context of the symptoms would be different in the different disorders. As an example, consider a child who frequently has temper tantrums. When related to SAD, the tantrum’s purpose is to prevent parents from leaving, which fits the SAD symptom criteria of being “persistently and excessively fearful or reluctant to be alone or without major attachment figures at home or other settings” (APA, 2000, p. 113). However, the tantrum also may be viewed as a symptom of ODD (often loses temper); especially if it occurs in the context of the child refusing to comply in a coercive parent-child interaction (Patterson, 1982). Through this example, a dilemma becomes clear. When the parents of this child are filling out a rating scale (such as the Child Behavior Checklist; CBCL; Achenbach & Rescorla, 2001), they would be correct in indicating that temper tantrums are a frequent problem. However, if the child’s tantrums were related to SAD, this behavior would be
erroneously counted as an ODD symptom on the CBCL rather than reflecting the anxiety related to SAD. We should also consider the opposite of this, children who are oppositional may be perceived as being anxious, such as when a girl cries or whines to get out of a task (Ohan & Johnston, 2005). Similar to the temper tantrum of the above example, this behavior would now be rated on many rating scales as an anxious behavior, crying, rather than as manipulation to achieve a goal of non-compliance. It should be noted that the DSM-IV TR (APA, 2000) does specify under the criteria for SAD that ODD should not be considered comorbid unless the defiant behaviors occur in the absence of anxiety. However, few parents know this caveat, and parent and teacher rating scales or clinical interviews conducted by laypersons do not necessarily make this distinction clear. As we can see then from these examples, the reliance on parent-rated scales for diagnostic purposes may create difficulties for the accurate diagnosis of childhood disorders due to behavioral items that are ambiguous in the absence of any context.

An additional complication in studying the comorbidity of disorders is the question of whether psychological disorders are best represented as discrete conditions or whether they represent dimensions that vary to some quantitative extent from non-pathological conditions (Marcus, Lilienfeld, Edens, & Poythress, 2006). While the DSM-IV TR is organized into separate categories with cutoff points for what entails a disorder (Marcus et al., 2006), reflecting an idea that the disorders represent discrete entities, it is actually described in the DSM-IV TR that “there is no assumption that each category of mental disorder is a completely discrete entity with absolute boundaries dividing it from other mental disorders or from no mental disorder” (APA, 2000, p. xxxi). Much debate
has occurred around this subject, and recent research has suggested that some disorders may be categorical in nature (e.g., schizotypy; Lenzenweger & Korfine, 1992), whereas others may be dimensional (e.g., depression; Slade & Andrews, 2004). For the purposes of this study, both SAD and ODD will be considered to be dimensional constructs. This approach best permits exploration of the behaviors or symptoms that make up these disorders and the determination of the extent to which the behaviors within the two dimensions overlap (Burns, Walsh, Owens, & Snell, 1997). Additionally, much of the recent literature also suggests that SAD and ODD are indeed dimensional in nature (Norton, 2006), and several researchers have emphasized the importance of looking at comorbidity in a dimensional manner (e.g., Nigg, 2001; Sergeant, Geurts, & Oosterlaan, 2002).

This dissertation will address some of these issues regarding assessing the comorbidity between SAD and ODD. First, I will outline the diagnostic criteria for both SAD and ODD. I will then summarize the genetic, biological, and environmental theories and supporting evidence of the etiology of these disorders and their co-occurrence. Next, I will discuss the substantive explanations for the rates of co-occurrence among these disorders often found in epidemiological studies and how these fit with the current etiological theories and evidence. Finally, I will examine three common methodological explanations for the covariance between disorders: referral bias, overlapping or ambiguous behaviors, and negative halo effects. However, prior to tackling the issues associated with co-occurring disorders, it is prudent to first outline the disorders separately.
### 1.1 – Separation Anxiety Disorder

Anxiety disorders are some of the most common psychiatric disorders among child or adolescent populations (Cartwright-Hatton, Roberts, Chitsabesan, Fothergill, & Harrington, 2004), having an estimated prevalence rate in children and adolescents between 3 to 13% in community samples and between 6 and 16% in clinic samples (Silverman & Saavedra, 2003), and typically affecting a higher proportion of females than males (Breton et al., 1999). According to the DSM-IV TR (APA, 2000), SAD is the only anxiety disorder for which the diagnostic criteria were created specifically for children rather than assuming that children and adolescents would experience the symptoms in the same manner as adults.

SAD is characterized by excessive anxiety concerning separation from the home or from those to whom the child is attached (APA, 2000). The onset of SAD can range from as early as preschool to as late as 18 years of age, although childhood onset is the most common, and the symptoms must be present for at least 4 weeks (unlike other anxiety disorders which require symptoms to be present for at least 6 months). These symptoms must also be age-inappropriate, and interfere with personal, social, or occupational or academic functioning. The prevalence of SAD is estimated at approximately 5% of children and young adolescents, although there is significant variation across studies with rates ranging from 2% to 13% (Foley et al., 2004). It is also recognized that SAD, as with most anxiety disorders, is more common among females in community samples (Breton et al., 1999), and this gender difference is most pronounced when diagnosis is based on parental report (Foley et al., 2004). Children of parents with panic disorder and/or major depression have been found to be at an increased risk for
SAD (Biederman et al., 2001; Bernstein, Layne, Egan, & Nelson, 2005). Due to the avoidance behaviors associated with SAD, children often resist when asked to comply with developmentally appropriate expectations, and often become demanding, intrusive, and require constant attention (Garland & Garland, 2001). Occasionally the child’s resistance may become extreme, such as becoming physically aggressive towards the individual attempting to force him/her into situations where separation becomes increasingly likely (APA, 2000). This may increase family conflict as parents become increasingly frustrated with the anxious child’s reluctance to comply with parental expectations (Garland & Garland, 2001).

Despite being less likely to present for services than other conditions, such as behavior problems (Coles, Turk, Jindra, & Heimberg, 2004; Schneier, Johnson, Hornig, Liebowitz, & Weissman, 1992), anxiety is a serious condition that can have negative consequences in a number of domains, including academic and interpersonal functioning (Cartwright-Hatton et al., 2004). Children with SAD may be at risk for school avoidance or failure and for impaired social interactions. Moreover, anxiety during childhood and adolescence has been found to be fairly stable and frequently children who have one anxiety disorder have another co-occurring anxiety disorder (Ford et al., 2003). Childhood anxiety also tends to be associated with other serious conditions, such as depression, disruptive behavior disorders, and substance abuse (Angold, Costello, & Erkanli, 1999).

1.2 – Oppositional Defiant Disorder

Oppositional defiant disorder (ODD) is one of the most prevalent childhood externalizing disorders, estimated to affect between 2 to 16% of youth, and is more likely
to be diagnosed in boys than girls prior to the onset of puberty (APA, 2000). The DSM-IV TR (APA, 2000) suggests that ODD is more common in families in which at least one parent has a history of a mood disorder, ODD, CD, attention deficit/hyperactivity disorder (ADHD), antisocial personality disorder, or a substance-related disorder. It is also more common to find children with ODD among families with serious marital discord (Reid et al., 2003).

Individuals with ODD display a recurrent pattern of behavior that is disobedient, negativistic, defiant, and/or hostile towards authority figures, and that impairs the individual’s ability to function personally, socially, or academically over a period of at least 6 months. The onset is usually before the age of 8 and typically does not emerge later than early adolescence (APA, 2000). It has been found that ODD behaviors have relatively high stability from preschool through school age and early adolescence (Lavigne et al., 2001), and when occurring in young children they are related to both internalizing and externalizing disorders, and are predictive of longer-term difficulties, such as depression, ADHD, and CD (Gadow & Nolan, 2002; Kadesjö, Hägglöf, Kadesjö, & Gillberg, 2003; Mason et al., 2004; Rowe, Maughan, Pickles, Costello, & Angold, 2002).

Several longitudinal studies (Holmes et al., 2001; Lahey & Loeber, 1994; Lahey, McBurnett, et al., 2000; Loeber, Green, Keenan, & Lahey, 1995) have suggested that ODD is a precursor to CD. For example, Lahey, McBurnett, et al. (2000) supported their model of ODD behaviors as developmental precursors to CD using the data from the Developmental Trends Study. They found that ODD in Year 1 predicted CD in Years 2–8, after controlling for ADHD. This link between ODD and CD has meant that many
studies combine children diagnosed with either ODD or CD into one group (Ford et al., 2003; Frick, Cornell, Barry, Bodin, & Dane, 2003; Maughan, Rowe, Messer, Goodman, & Meltzer, 2004).

Now that I have outlined the characteristics of SAD and ODD, it is important to understand the etiological theories underlying these disorders, and so I will now summarize the most common theories that are inclusive of both anxious and oppositional behaviors, and will also highlight the theories and evidence that would be applicable to the comorbidity between SAD and ODD. These theories encompass genetic, biological, and environmental factors leading to both the development and the maintenance of these disorders. It is important to note here, however, that these etiological theories are not intended to represent monolithic mechanisms for the development of either SAD or ODD. Rather, they are put forward as a set of heterogeneous pathways through which different children may travel to different extents, and yet arrive at similar end points.

1.3 – Genetic Contribution to Anxiety and Oppositional Behaviors

Over the past decade, there have been several studies using classical twin designs to disentangle the genetic and environmental influences on continuity and change in the development of internalizing and externalizing behaviors (Bartels, van den Oord, Hudziak, Rietveld, & van Beijsterveldt, 2004; Gregory, Eley, & Plomin, 2004; O'Connor, Neiderhiser, Reiss, Hetherington, & Plomin, 1998; Van der Valk, van den Oord, Verhulst, & Boomsma, 2003). Van der Valk and colleagues (2003) studied a sample of Dutch children ages between 3 to 7 years, and used the Child Behavior Checklist (Achenbach, 1991, 1992) to measure their problem behaviors. For externalizing problems, genetic factors explained 55% of the phenotypic stability, and this influence
remained relatively constant over the years. For internalizing problems, genetic factors explained 66% of the phenotypic stability, although this influence seemed to decrease with age as environmental factors became more important. O'Connor and colleagues (1998) followed 405 families over a 3-year interval to assess the genetic and environmental influences on antisocial behaviors and depression. Participants ranged in age between 10 and 18 years of age at the first assessment, and consisted of monozygotic and dizygotic twins and full, half, and step siblings (all of the same sex). Results were similar to those of Van der Valk and colleagues (2003), showing that genetic factors explained 54% of the phenotypic stability for antisocial behaviors (O'Connor et al., 1998). For depressive symptoms, genetic factors explained 64% of the phenotypic stability. However, neither of these studies looked specifically at the genetic associations between anxiety and oppositional behaviors.

As noted in the sections describing each disorder, SAD tends to be more common among children whose first-degree relatives have anxiety disorders than in the general population, whereas ODD is more common in families in which at least one parent has a history of a mood disorder (i.e., depression or bipolar disorders), ODD, CD, ADHD, antisocial personality disorder, a substance-related disorder, or serious marital discord. This suggests that the familial patterns of SAD and ODD do not overlap, and therefore that the disorders may not share common genetic factors. To look more closely at this, Gregory and colleagues (2004) used the Twins Early Development Study to provide a behavioral genetic analysis of the association between anxiety and conduct problems among preschoolers, assessing them at 18 months, and again at 2, 3, and 4 years of age. They used parental report to assign zygosity. Parents of the twin pairs completed the
Revised Rutter Parent Scale for Preschool Children (Hogg, Rutter, & Richman, 1997), a behavioral rating scale having both anxiety and conduct components, with the conduct problem items reflecting symptoms of both ODD and CD. They found the correlation between genetic influences on anxiety and genetic influences on conduct problems to be $r = .31$ for boys and $r = .16$ for girls. This suggests that some genetic factors are common between the two behavioral problems, although most of the genetic influence on both anxiety and conduct problems appears to be unique to each problem (Gregory et al., 2004). They suggested that the possibility for the overlap stems from both anxiety and disruptive behavior problems having high levels of reactivity to threat or challenge. For example, reactive aggression and explosiveness may occur in children with conduct problems, and anxious children may react strongly (e.g., crying) to mild stressors. Gregory and colleagues (2004) present the possibility that a modulatory neurotransmitter, such as serotonin, plays a role in regulating the reactivity of complex emotional substrates in the brain that are dysregulated in children with both anxiety and conduct problems. This is due to the finding that whole blood serotonin (5-HT) correlates positively with conduct symptoms, but negatively with symptoms of anxiety (Gregory et al., 2004). Their hypothesis, that serotonin plays a role in regulating the reactivity of complex emotional substrates in the brain, however, remains to be tested.

In short, although studies have been conducted with differing aged samples and with different methods for measuring child behaviors, most studies indicate reasonably large influences of genetic factors on the stability of both internalizing (including SAD) and externalizing (including ODD) problems. In addition, some researchers are beginning to look for genetically mediated systems, such as serotonin, that may play a role in both
anxious and oppositional behaviors, although much more research is needed in this area. I now turn to other biological theories through which both anxious and oppositional behaviors have been linked.

1.4 – Biological Theories of Anxiety and Oppositional Behaviors

1.4.1 – Behavioral inhibition and activation systems. The first of the biological theories that I will discuss is that of the Behavioral Inhibition and Activation Systems, which may be related to executive-cognitive functioning (Sergeant et al., 2002). Gray (1985, 1987, 1991, 1994) proposed three independent, but interrelated, systems in the brain related to responses to reward and punishment. The first is the fight/flight system, which responds to unconditioned pain and punishment to produce fight or flight. The second, called the reward or behavioral activation system (BAS), responds to conditioned reinforcement, being either reward or relief from punishment, and underlies reward responding, active avoidance and escape. The third system, the behavioral inhibition system (BIS), responds to conditioned stimuli for punishment, whether the application of an aversive stimulus or the removal of a pleasurable one, as well as to novelty and innate fear stimuli, to bring about passive avoidance and extinction. Since the fight/flight system responds to unconditioned pain or punishment, an under-responsive BIS or over-reactive BAS would not serve to impair responses to unconditioned punishment. The BIS and the BAS are antagonistic to each other (Quay, 1997), and therefore behavior that is not dependent on unconditioned stimuli results from the relative balance of the two systems. The operation of the BIS and BAS, then, seems especially crucial in understanding those individuals who seem unable to inhibit responding in the face of probable punishment when seeking some sort of reward, which has been linked to aggression and oppositional
behavior, or those who inhibit too much, which has been associated with anxiety (Quay, 1997).

It is not that children with ODD are unresponsive to punishment per se, but rather they are less responsive than others to the conditioned cues and signals that punishment is likely to be contingent upon their responses, especially in the face of potential reward (Quay, 1997). This equates to the BAS being more active than the BIS. In contrast, under this model, anxiety is characterized by a more active BIS relative to the BAS, resulting in over-sensitivity to cues and signals of punishment (Matthys, van Goozen, de Vries, Cohen-Kettenis, & van Engeland, 1998; Pliszka, Hatch, Borcherding, & Graham, 1993). Therefore, the relative strength of one system in relation to its opposing system is responsible for whether the responses are likely to be anxious and inhibited or disinhibited and antisocial. Under this theory then, it would be impossible to have both an anxious and oppositional response at the same time, as the over-activity in both systems would effectively cancel out and result in normal functioning and behavior.

Research over the past decade has been used to test the influence of the BIS/BAS in children with oppositional or conduct problems. Matthys, van Goozen, Snoek, and van Engeland (2004) tested the hypothesis that the dominance of the BAS over the BIS should be more pronounced in children with oppositional or conduct problems than among a control group. Children with oppositional or conduct problems were solicited from a day treatment program. They used the CBCL (Achenbach, 1991) to ensure that the levels of aggressive and delinquent behaviors displayed by the oppositional/conduct problem group were significantly different from the comparison group. Boys ranged in age from 7 to 12 years. This study used the door-opening perseveration task designed by
Daugherty and Quay (1991), in which a series of 110 preprogrammed winning or losing doors were presented sequentially on a computer. Within a set of 10 doors, winning and losing doors were randomly sequenced. If the door the participant selected was a winning door, they earned a small monetary reward. However, when it was a losing door, participants received a fine equal to the amount given as reward. The probability of a winning door appearing within the set decreased by 10% with each succeeding set, thus decreasing over all doors from 100% to 0%. The dependent measure was the total number of doors opened before the child quit, ranging between 0 and 110 doors. To obtain the maximum reward possible, the child was required to continue opening doors until the odds of winning turn unfavorable (below 50%) at which point the participant should quit. Matthys and colleagues (2004) confirmed the prediction that the oppositional/conduct problem group opened significantly more doors than the control groups, and although on winning trials there was no difference between groups in the time to open the next door, the oppositional/conduct problem group took significantly less time to open the next door after a loss than did the control group. These findings support that for the oppositional/conduct problem group, the potential for reward overrode the increasing likelihood of punishment, or stated another way, the BAS dominated the BIS. However, this study did not have an anxious group for comparison, although previous studies using a similar method have shown that children with severe conduct problems exhibited a reward-dominant response style only in the absence of a comorbid anxiety disorder (O'Brien & Frick, 1996).

One of the most common methods of testing the influence of the BIS/BAS in both anxious and oppositional children has been to examine the ability of these children to
inhibit responding using the Stop-Signal task. The Stop-Signal task is an inhibition task that requires an individual to attend and respond to visual stimuli unless they are given a preceding auditory cue that they should not respond to that particular trial. According to Gray (1985, 1987, 1991, 1994), the presence of anxiety, which indicates activity in the BIS, should improve inhibition and thus performance on the Stop-Signal task, and that ODD, indicating an over-active BAS, would be linked to a poorer performance on the Stop-Signal task. Oosterlaan and Sergeant (1996) studied four groups of children with ages ranging from 6 to 12 years - ADHD, aggressive/oppositional, anxious, and normal controls. Although both the ADHD and aggressive/oppositional groups demonstrated slower and more variable reaction times on all trials, only the aggressive/oppositional group showed a significantly slower Stop-Signal reaction time (slower Stop-Signal reaction times indicate increased difficulty in inhibiting a response). In addition, the aggressive/oppositional group was less likely to inhibit over all Stop-Signal delay intervals than the anxious and normal groups, particularly when the Stop-Signal occurred early so that for the anxious and normal groups there was a high probability of inhibition. There were no significant differences between the anxious and normal groups, although this may have been due to a floor effect, where the fastest response times possible are limited by human physiology. Another explanation that has been suggested for the lack of any difference between the anxious and normal groups was that this task failed to actually trigger the over-active BIS in anxious children, as there was no impending punishment or frustrating non-reward (Oosterlaan & Sergeant, 1996). Oosterlaan and Sergeant (1996) argued that these findings suggest that the aggressive/oppositional group had a decreased ability to inhibit responding due to an overactive BAS.
1.4.2 – The HPA axis and the fearlessness theory. Another system that has been used by researchers of both anxiety and oppositional behaviors as a potential underlying biological mechanism is dysfunction of the hypothalamus–pituitary–adrenal (HPA) axis. The HPA axis is a central control and regulatory system of an organism that connects the central nervous system (CNS) with the hormonal system, and in mammals serves as the primary stress response system (Feder et al., 2004; Kudielka & Kirschbaum, 2005). This system helps the organism adapt to increased demands and maintain homeostasis after experiencing a stressor, and can be estimated using measures of its end products, the glucocorticoids, such as salivary cortisol.

The HPA axis is thought to play a central role in the pathophysiology of anxiety disorders, as acute stress is often associated with increased cortisol secretion (Arborelius, Owens, Plotsky, & Nemeroff, 1999; Feder et al., 2004). Kagan, Reznick, and Snidman (1988) found elevated salivary cortisol levels in children who exhibited behavioral inhibition when they were exposed to a novel social environment, a characteristic that has been associated with childhood-onset and later anxiety disorders (Biederman et al., 1993). Coplan and colleagues (2002) found similar results among children with anxiety disorders immediately before an anxiety eliciting procedure.

Like with anxiety, the HPA axis has been recently studied in terms of its application to oppositional behaviors because of its stress regulating function. Some children with early-onset oppositional and conduct problems, especially those who are viewed as being callous and unemotional, and who are often described as thrill- and adventure-seeking, have been found to be less sensitive to cues of punishment when a reward-oriented response set is primed (Fisher & Blair, 1998; Frick, Cornell, Bodin, et
al., 2003; Frick, Lilienfeld, Ellis, Loney, & Silverthorn, 1999; O'Brien & Frick, 1996), as well as less reactive to threatening and emotionally distressing stimuli (Blair, 1999; Frick, Cornell, Bodin, et al., 2003; Loney, Frick, Clements, Ellis, & Kerlin, 2003). These characteristics are consistent with a temperamental style that is often associated with low emotional reactivity to aversive stimuli and characterized behaviorally by low fearfulness to novel or threatening situations and poor responsiveness to cues of punishment (Kagan & Snidman, 1991), especially under reward conditions. It has been theorized that low levels of autonomic nervous system activity reflect low levels of fear (Raine, 1993, 2000a, b; van Bokhoven, Matthys, van Goozen, & Engeland, 2005). According to this theory, also known as the Fearlessness theory, one can hypothesize that fearless individuals are more likely to engage in oppositional behavior to obtain rewards because they lack fear of the negative consequences of aggressive actions. Consistent with such a theory, most psychobiological investigations of children and adolescents with early onset oppositional and conduct behaviors have observed an inverse relationship between the magnitude of behavioral deviance and salivary cortisol levels (Kariyawasam, Zaw, & Handley, 2002; McBurnett, Lahey, Rathouz, & Loeber, 2000; Pajer, Gardner, Rubin, Perel, & Neal, 2001; van Goozen, Matthys, Cohen-Kettenis, Buitelaar, & van Engeland, 2000; van Goozen et al., 1998). As in adults, low levels of HPA-axis activity in these younger age groups have been interpreted as indicators of stress hypo-activity or fearlessness (Van Goozen et al., 2000).

Both of these proposed biological theories, the BIS/BAS and HPA/Fearlessness theories, strongly suggest that anxious and oppositional behaviors are related to one another, but through opposing processes so that SAD and ODD disorders should not co-
occur. However, not all theories explaining these disorders are tied to either genetics or biological systems. In their twins' studies, both O'Connor and colleagues (1998) and Van der Valk and colleagues (2003) found that in addition to the genetic influences, both shared and non-shared environmental influences also contributed to anxious and oppositional behaviors. I now turn the discussion to parenting practices, which is one of the foremost environmental factors that is proposed to contribute to both anxious and oppositional behaviors (Morris et al., 2002).

1.5 – Parenting Practices as an Environmental Risk Factor for Anxiety and Oppositional Defiant Disorders

For more than 3 decades, there has been a strong focus on parenting as a crucial factor in understanding the development of behavioral and emotional problems among children (Collins, Maccoby, Steinberg, Hetherington, & Bornstein, 2000). In early observational research, parenting style, particularly the parenting style of mothers, reliably predicted the patterns of social interaction of preschoolers within a school context (Baumrind, 1967). Specifically, Baumrind (1967) pointed out that mothers who were characterized by warmth and nurturance, tended to have socially competent children. Research has demonstrated that these mothers are able to encourage their children's autonomy and independence while still placing limits, demands, and controls upon them (Dumas, LaFreniere, Beaudin, & Verlaan, 1992; LaFreniere & Dumas 1992).

By contrast, both the development of anxious and oppositional behaviors have been linked to more negative parenting behaviors (Messer & Beidel, 1994; Patterson, Reid, & Dishion, 1992). Baumrind (1967) suggested that mothers who could be characterized as inconsistent in their parenting behaviors, who tended to be either lax or
overly harsh in their discipline (or who oscillated between these two extremes unpredictably), and who tended to be emotionally distant, tended to have aggressive children. Research has shown these mothers respond to child misbehavior in an inconsistent manner and often fail to impose clear limits, especially when their children exhibit extreme negative behaviors (Dumas, LaFreniere, & Serketich, 1995; McMahon & Estes, 1997; Patterson et al., 1992). A study conducted by Wakschlag and Hans (1999) found that early parenting behaviors which included poor supervision, harsh or inconsistent discipline, and/or low involvement in the child's activity predicted subsequent ODD and CD behaviors.

Another class of mothers are those who can be characterized by behaviors that are consistently negative, over-controlling, rigid, punitive, and showing little warmth and responsiveness (Baumrind, 1967). Studies have shown that these mothers maintain a level of control over the child that leaves the child with insufficient opportunities to assert a developmentally appropriate degree of autonomy (Hudson & Rapee, 2001; Hudson & Rapee, 2002), which has been linked to child anxiety problems (Dumas et al., 1995).

In summary, research over the last few of decades has demonstrated that negative parenting behaviors such as hostility, control, and a lack of responsiveness have a greater impact on child outcomes than previously believed (Collins et al., 2000). Both the development of anxious and oppositional behaviors have been linked to these negative parenting behaviors (Messer & Beidel, 1994; Patterson et al., 1992). In addition, recent studies have shown that parent-child interactions associated with varying levels of power and control have separated children who are anxious from those who are aggressive, with aggressive children having more power in the parent-child relationship and their
permissive mothers being unable to exercise appropriate control (McMahon & Estes, 1997), and anxious children having insufficient opportunities to assert autonomy over their overly rigid and controlling mothers (Hudson & Rapee, 2002). Thus, there appear to be distinct parenting behaviors associated with both SAD and ODD. However, it should be noted that these parenting behaviors are not necessarily mutually exclusive, so it is possible that negative parenting behaviors in general are contributing to the comorbidity between SAD and ODD, although research addressing this particular issue is scarce.

Overall, the theories I have discussed offer differing views on the etiology of both SAD and ODD. The studies discussing the genetic contributions towards these disorders have shown large influences on the stability of the problem behaviors, and have begun to examine genetically mediated systems, such as serotonin, that play an opposing role in anxiety and oppositional behaviors (Gregory et al., 2004). Both the BIS/BAS and HPA/Fearlessness theories also strongly suggest that the etiological processes for SAD and ODD oppose each other (Gray 1985, 1987, 1991, 1994; Raine, 1993). Finally, parenting factors have been used in describing the etiologies of both anxiety and aggression/oppositionality, with oppositional children having mothers who are overly permissive, inconsistent, and/or overly harsh, and authoritarian mothers who are overprotective, over-controlling, and who fail to grant autonomy to their children having children who are anxious (Hudson & Rapee, 2002; McMahon & Estes, 1997). However, it is important to reiterate that these various theories are not intended to represent monolithic mechanisms for the development of either SAD or ODD, but rather that various children may arrive at a diagnosis of SAD or ODD by a combination of the above mentioned pathways. Additionally, it also is important to note the importance of
considering these theories together due to possible gene–environment interactions. The gene-environment covariation of genetic and environmental factors (e.g., parents with overcontrolling parenting may also pass on a genetic risk for anxious psychopathology), means that it is difficult to determine the extent to which the child’s psychopathology is determined by either environment or genetics (Rutter, 2005), and indeed it is fallacious to imply that one operates freely from the other. Instead, it is important to recognize that genetics and biology are the basis of every human action, while equally considering the role of social context in eliciting the expression of specific social behaviors (Rutter, 1997).

Therefore, when we consider all of these etiological theories of SAD and ODD in tandem, they are all suggesting that these disorders should not be comorbid, and may in some cases lead us to predict a negative association (Dumas et al., 1995; Gregory et al., 2004; Matthys et al., 2004). However, recent epidemiological studies have shown a degree of comorbidity between anxiety and disruptive behaviors, including SAD and ODD, that is not commensurate with either these theories or the research evidence supporting them.

1.6 – Comorbidity

The rates of comorbidity for psychological disorders in general far exceed what would be predicted due to each disorder’s population base rate alone under the assumption that the disorders are independent of one another. To illustrate this, let us examine a commonly used example given by Caron and Rutter (1991), and assume that the incidence of depression is 20% in a given sample, and that 10% of the population is currently experiencing a bad cold. Under the assumption that depression and the common
cold have differing and independent etiologies, on the basis of the product of the two base rates it can be expected that around 2% of the patients seen at the practice will be experiencing both depression and a cold at a given time. If there are significantly more than 2% of the populations with both depression and a cold it would lead us to believe that depression and the common cold are not in fact independent of each other, and that having one actually increases the chances of having the other.

Another way that comorbidity has been expressed is as an odds ratio. Using the Caron and Rutter (1991) example, we can create a matrix with depression and common colds being either present or absent (see Table 1), and separate the percentage of people into each of the four categories. The odds ratio can be calculated by taking the product of the cell having neither of the disorders and the cell that has the comorbid disorders, then dividing that number by the product of the other two cells (depression only and cold only) (in this example 72x2/18x8). In this example, we obtain an odds ratio of 1, indicating that the odds of having either of these two conditions are indeed independent of the odds of having the other. An odds ratio greater than one would mean a greater overlap between the two disorders than would be expected by statistical chance alone, and an odds ratio less than one would mean a smaller overlap between the two disorders than would be expected by statistical chance alone. In both of these cases, the two disorders would not be independent. The first case, an odds ratio greater than 1, indicates that having one of the disorders increases the odds of having the other, and vice versa. The second case, an odds ratio less than 1, indicates that having 1 of the disorders decreases the risk of having the other, and vice versa.
Angold and colleagues (1999) conducted a meta-analysis using 21 community studies of children conducted between 1987 and 1997 that used standardized psychiatric interviews with parents and children to generate diagnoses according to the DSM-III, DSM-III-R, or DSM-IV. They chose to use reports of CD to represent both CD and ODD diagnoses as CD was the most commonly reported disorder in the majority of the studies they analyzed (although many included both ODD and CD), as well as using the most commonly reported anxiety disorder in their sample, which was over-anxious disorder, to represent all anxiety disorders. They found the odds ratio between ODD/CD and anxiety disorders to be 3.1, which is higher than the ratio predicted solely by statistical co-occurrence and higher than we would expect considering the available etiological theories for both anxiety and ODD, which would lead us to believe that the disorders should co-occur at a rate closer to or below 1.

Ford and colleagues (2003) conducted a study using the British Child and Adolescent Mental Health Survey, which consisted of parent and adolescent interviews and teachers’ reports. Half of the sample was male and the age range of the study was from 5 to 15 years. They reported an odds ratio of 5.4 for ODD and all anxiety disorders. This implies that anxiety disorders and ODD are not independent of each other, due to the increased probability of having both disorders, which would imply that these disorders should share common factors that are contributing to this increased risk of co-occurrence. Again, this is not commensurate with the current etiological theories of either disorder, or with the empirical support available for these theories.

More recently, Marmorstein (2007) examined the overlap of anxiety and ODD using the participants from the Methods for the Epidemiology of Child and Adolescent
Mental Disorders (MECA) study. The participants, who consisted of a community sample of youth-caretaker pairs, had completed a diagnostic interview conducted by laypersons (Lahey et al., 1996). Approximately half the sample was male, and the age of the youth ranged between 9 and 17 years with an equal sampling across all ages. Marmorstein reported odds ratios between ODD and various anxiety disorders ranging from 2.27 to 7.02 depending on the anxiety disorder in question, and more specifically, an odds ratio of 3.36 between SAD and ODD. Her findings were consistent with the findings of other epidemiological studies, but are once again not consistent with the etiological theories or findings. While outlining her conclusions and cautioning clinicians regarding avoiding assuming that youth with externalizing disorders are not anxious, or vice versa, she also suggested the possibility of symptom similarities partially explaining the overlap.

As discussed above, the proposed genetic, biological, and environmental mechanisms underpinning SAD and ODD suggest either that these disorders are independent of one another or that they are characterized by opposing mechanisms. Therefore, when considering the comorbidity between SAD and ODD, we should expect an odds ratio of 1 or less than 1, rather than the finding of odds ratios significantly greater than 1 that these epidemiological studies have noted. To explain this discrepancy between the etiological theories of the disorders and the empirical findings of these epidemiological studies, we need to address a variety of possible explanations for the elevated comorbidity, both substantive and methodological.
1.7 – Substantive Explanations for Comorbidity

Substantive explanations include pathogenic comorbidity, or one disorder predisposing or causing another (Kaplan & Feinstein, 1974). An example of this would be the possibility of an internalizing disorder playing a causal role in the genesis of an externalizing disorder, such as the data that Beyers and Loeber (2003) present indicating that depression serves as an independent risk factor for later conduct problems. However, when we consider this explanation in the context of anxiety and oppositional behaviors, a dilemma arises. Mason and colleagues (2004) found that the strongest predictors of adult violence were self- and parent-reported childhood conduct problems, both ODD and CD, and that self-reported childhood shyness, which was related to SAD and childhood social phobia, actually inhibited violence in adulthood. This finding is commensurate with the available theories previously discussed, which suggest SAD and ODD should not be comorbid, and that SAD could actually serve as a protective factor in the development of ODD (Gray, 1987, 1991, 1994; Daugherty & Quay, 1991; Quay, 1988; Raine, 1993, 2002a, b; van Goozen, Matthys, Cohen-Kettenis, Buitelaar, et al., 2000; van Goozen, Matthys, Cohen-Kettenis, Gispen-de Wied, et al., 1998; van Goozen, Snoek, Matthys, van Rossum, & van Engeland, 2004; Walker et al., 1991).

A second substantive possibility is that oppositional behaviors may contribute to the development of anxiety. For example, Frick and colleagues (1999) hypothesized that repetitive oppositional and antisocial behaviors may give rise to recurrent state anxiety, as these children may be confronted with increasing family conflict and academic problems. Frick and colleagues (1999) reasoned that situations involving family conflict and academic problems may produce repeated episodes of state anxiety, which then
might be difficult to distinguish from the trait anxiety observed in most anxiety disorders. While this certainly seems a plausible explanation as to why epidemiological research finds overlapping reports of the two disorders, the question remains as to whether a recurring state anxiety is truly the same as the trait anxiety that underlies current DSM diagnoses for anxiety disorders. This possibility also suggests a temporal ordering of oppositional and anxious behaviors which does not necessarily fit with the callous and fearlessness temperamental traits that have been found to characterize those with early onset, more severe, and longer-term oppositional/conduct problems (Frick et al., 2003). Additionally, in their study Mason and colleagues (2004) found that childhood ODD did not predict anxiety disorders in adulthood, and that adult social phobia was only related to parents’ and self-reported childhood shyness and parent-reported childhood attention problems.

As Lilienfeld (2003) pointed out, there are two broad classes of explanations, methodological and substantive, which can be used to explain when disorder A is significantly comorbid with disorder B. It is now clear that while substantive explanations have been offered to explain the comorbidity between some internalizing and externalizing disorders, they are not necessarily commensurate with either the etiological theories of childhood anxiety and oppositional behaviors, nor with the empirical support for these theories. Therefore, the methodological explanations should also be considered.

1.8 – Methodological Explanations for Comorbidity

Methodological explanations include referral bias, whether Berksonian bias or clinical selection bias, negative halo effects, or the presence of behavioral overlap
(Lilienfeld, 2003). Berksonian bias is a mathematical consequence of the fact that an individual with two disorders can present for treatment for either disorder, and is thus at greater chance of being detected than an individual who has a single diagnosis. Clinical selection bias results from individuals with two disorders experiencing a greater level of impairment, and thus they are more likely to seek or be referred for treatment than are individuals with only one disorder. However, while referral biases may contribute to comorbidity in certain samples, such as those that may be seen in clinical samples, such biases do not provide an adequate explanation for the general findings of covariation between externalizing and internalizing disorders in community samples and epidemiological studies (Angold et al., 1999).

It has been argued that behavioral overlap, which means that symptoms for two different disorders appear to be the same or are highly similar (e.g., for ADHD, often fidgets, and for Generalized Anxiety Disorder, restlessness), is unlikely to account for most cases of comorbidity between internalizing and externalizing disorders because the amount of criterion overlap between most disorders in the two general categories is minimal (Lilienfeld, 2003). This may be true for some symptoms of aggression/oppositionality and anxiety, such as being mean, fighting, teasing, threatening, not feeling guilty, which are aggressive/oppositional type behaviors, and being fearful and anxious, and fearing animals, situations, or places, which are anxiety behaviors. These can be viewed as “pure” or specific behavioral criteria for each of the classes of disorders. However, there are several behavioral symptoms that appear to be more context specific, and might be categorized as behaviors related to either SAD or ODD depending on the situation in which they occur (Garland & Garland, 2001; Marmorstein,
These include internal experiences such as feeling worthless or feeling unloved, as well as more overt behaviors, such as crying, arguing, screaming, demanding attention, school refusal, and temper tantrums. This overlap of potentially ambiguous behavioral criteria between SAD and ODD may be especially problematic given the reliance on parents' and teachers' ratings of child behavior in the assessment of childhood disorders. Parent rating scales do not include the context under which the behaviors they are querying occur. This increases the chance for confusion, with parents thinking of one context when endorsing the behavioral item, but the rating scale assuming a different context, such as was described earlier in the example of the child having a temper tantrum. Such confusion would lead to an artificial overlap of diagnoses and a higher incidence of SAD and ODD comorbidity than would be expected solely on the basis of chance or when the current theories of etiology for the two disorders are taken into consideration.

The third methodological explanation for comorbidity between SAD and ODD is what has been termed a negative halo effect. This term has been used in the literature to refer to the impact of one class of behaviors on the perception of another class. An example of this is an experiment by Abikoff, Courtney, Pelham, and Koplewicz (1993) in which they manipulated the oppositional behaviors of child actors who were being rated by teachers using scales that measured hyperactivity and inattentiveness. They found that teachers' ratings of hyperactivity and inattentiveness were significantly higher for the boys who exhibited oppositional rather than normal behavior. This is similar to what Foley and colleagues (2004) found when looking at parent and child interviews and behavior ratings of SAD and ODD behaviors. Using the Virginia Twins study, which
consists of data for both males and females from ages 8 to 17, they found that when SAD was diagnosed by child interview only, it was strongly associated with other parent-rated anxiety disorders as well as parent-rated ODD. In particular, they found five of the DSM-IV TR symptoms for ODD to be frequently endorsed by parents of children who had been diagnosed with SAD. These symptoms included: often argues with adults, often deliberately annoys people, often blames others for his or her mistakes or misbehavior, often angry and resentful, and often spiteful and vindictive. However, they also found that SAD did not co-occur with ODD when both diagnoses were based solely on child interview. They suggested that parents might interpret conflict associated with SAD as defiance. Similarly, if parents believe that children who misbehave are more likely to be anxious, such as feeling guilty or anticipating punishment, they may be more likely to describe children with ODD as having a higher incidence of both anxiety and ODD behaviors, resulting in a higher than expected incidence of anxiety and ODD co-occurrence.

1.9 – The Present Study

Biological and environmental explanations of SAD and ODD suggest that these disorders should not co-occur, and that perhaps one should even play a protective role against the development of the other. However, the findings from epidemiological studies have indicated that having one of the disorders places the child at increased risk of having the other. The substantive explanations that have been offered for the existence of comorbidity between internalizing and externalizing disorders are not commensurate with the etiological theories for SAD and ODD or the research evidence that has been found in support these theories. Alternatively, it has been suggested that the perceived comorbidity
between SAD and ODD may be the result of either ambiguous/context-lacking symptom descriptions or of negative halo effects on parent-completed rating scales. It is the purpose of this dissertation to assess the role of ambiguous/context-lacking symptoms and negative halo effects in mothers' perceptions of children's expression of SAD and ODD behaviors.

This dissertation is comprised of two studies. The first study uses written scenarios to describe children between the ages of 7 to 10 years who are displaying behaviors consistent with either a diagnosis of SAD or ODD. Since clinicians seek and obtain information significantly more often from mothers and children than from other informants regarding child internalizing and/or externalizing problems (Treutler & Epkins, 2003), only mothers were recruited for this study. After reading each scenario, mothers rated the child in the scenario on the presence of SAD and ODD behaviors using items taken from commonly used parent-rated measures of childhood psychopathology (CBCL; Achenbach & Rescorla, 2001; ODD Rating Scale; Hommersen, Murray, Ohan, & Johnston, 2006; Spence Children's Anxiety Scale [SCAS]; Spence, 1998). The behaviors from these measures were divided into four categories: Pure Anxiety, Ambiguous Anxiety, Ambiguous Oppositional, and Pure Oppositional, based on judgments by clinical psychologists and trainees. The Pure Anxiety category is representative of items that are considered to be pure exemplars of SAD, such as “clings to adults or too dependent,” whereas the Ambiguous Anxiety category represents items that are considered to be representative of behaviors expected in children experiencing SAD but may also be observed in children experiencing ODD behaviors, such as “cries a lot.” Without knowing the context of these ambiguous behaviors, it would not always be
clear that they represent anxiety problems. Conversely, the Pure Oppositional category is representative of items that are considered to be pure exemplars of ODD, such as “often blames others for his/her misbehavior,” whereas the Ambiguous Oppositional category is representative of items considered to be characteristic of ODD but may also be observed in children with SAD, such as “demands a lot of attention.” Again, without context these behaviors would not be clearly seen as oppositional.

In this first study, several hypotheses are tested. The first hypothesis – that mothers are able to accurately separate and rate the SAD items and the ODD items. Therefore, mothers should be able to rate the pure exemplars and the ambiguous behaviors that are consistent with the scenario presented as more likely than the ambiguous behaviors and pure exemplars that are inconsistent with the scenarios (i.e., ODD behaviors for SAD scenarios and SAD behaviors for ODD scenarios). The second hypothesis is the context-specific hypothesis – that there exist ambiguous/context-lacking (hereafter referred to as ambiguous) behaviors for SAD and/or ODD that are rated by parents as likely to occur among children described with the opposite disorder. Under this hypothesis, the pure exemplar behaviors that are consistent with the behaviors presented in the scenario should be endorsed as being more likely than the ambiguous behaviors consistent with the scenario. However, the ambiguous behaviors that are not consistent with the scenario should be endorsed as more likely than the pure exemplars of the inconsistent behaviors. Finally, a negative halo hypothesis can be considered – that mothers are more likely to endorse any type of non-specific symptom among children portrayed with either SAD or ODD symptoms. Under this hypothesis, mothers should
rate the non-specific, somatic items as being equally likely as the ambiguous items of the non-represented disorder in the scenarios.

However, due to the analogue nature of the first study, a second study was used to determine whether, in a clinical sample, the removal of ambiguous behaviors from a commonly used child behavioral measure would result in a decrease in the degree of relatedness between SAD and ODD. The second study uses data from the parent and youth versions of commonly used childhood psychopathology measures, the CBCL and the Youth Self-Report (YSR; Achenbach & Rescorla, 2001). The data were collected from clinical cases of both males and females between the ages of 12 and 17 at a provincially-funded child and adolescent assessment facility. In this study, the correlations between the Pure Anxiety and Pure Oppositional items from the CBCL and the YSR are calculated and compared to the correlations between the two commonly-used empirical scales and between the two DSM-oriented scales on these measures that are used to assess either SAD or ODD. The ambiguous behavior hypothesis suggests that the correlation between the scales created from only the pure items should be significantly smaller than the correlations between the empirical and DSM-oriented scales, which contain both pure and ambiguous items.

There are several advantages to conducting both of these studies and considering their results in tandem. The strength of the analogue study is the high degree of control over the stimuli that the mothers will receive. This ensures that the children described in the scenarios display only one type of behavior, whether SAD or ODD, and this study can therefore address the issues regarding the potential for overlapping behaviors due to ambiguous items or negative halo effects. However, analogue studies are limited in that
the high degree of control likely oversimplifies the situation and may not accurately reflect parents’ real-life experiences or children’s actual presentations of behaviors. Therefore, the second study, which uses a clinical sample and is therefore less controlled in terms of the behaviors the children being rated are actually experiencing, allows the investigation of the degree of diagnostic overlap using only the so-called pure items when compared to scales from common child behavioral measures on a clinical sample of children and adolescents.
Chapter II – Experiment 1

2.1 – Method

2.1.1 – Participants. Seventy-two mothers (40 of boys and 32 of girls) were recruited for an Internet-based study from various community sources (e.g., newspaper advertisements, school newsletters, lab newsletters) across British Columbia or were notified of the study through the Parenting Lab volunteer registry (a registry of past participants who have agreed to participate in future studies). The brief statement used in advertising the study simply stated, “Mothers of 7-10 year olds are needed to participate in UBC psychology research. Internet questionnaire can be done from home. Honorarium provided.” A toll-free number was provided and interested mothers then called the Parenting Lab at the University of British Columbia where they were given further information regarding the study and invited to participate. As an adequate grasp of the English language was required for this study, mothers were asked if English was their primary language. If English was not their primary language, mothers were asked how long they had been speaking English, and were excluded from the study if this length of time was less than 3 years. Although 133 interested and eligible mothers responded to the advertisement, only 72 mothers (54.14%) completed all measures in the survey and were subsequently used in the following analyses. The other 61 mothers failed to complete at least one measure and were therefore excluded. This response rate is consistent with previous response rates for web-based surveys (Kittleson & Brown, 2005).

Mothers’ ages ranged from 27 to 54 years ($M = 38.32$, $SD = 5.55$), and the children’s ages ranged from 7 to 10 years ($M = 8.35$, $SD = 1.02$). The families represented all socioeconomic status (SES) classes (range, 1 to 5), as measured by the
Hollingshead Four Factor Index of Social Status (Hollingshead, 1975) with a mean of 2.67 ($SD = 0.82$), which corresponds to middle class. Mothers were asked to report their marital status, and 73.6% of participants indicated they were currently married or were living with long-term partners, 16.7% were divorced, separated, or widowed, and 9.7% were single and had never been married. Of the 95.2% of the sample who self-reported their ethnicity, 73.9% identified themselves as Euro-Canadian, 13.0% as Asian, 2.9% as East Indian, and 10.0% as other, less frequent categories (e.g., 1.4% as First Nations and 1.4% as Hispanic).

2.1.2 - Procedure. Mothers contacted the Parenting Lab beginning in February 2006 and recruiting continued until June 2006. In the initial phone contact, participants were told that the purpose of the study was to investigate influences on how child behavior symptoms are reported on several commonly completed parent report measures of child behavior. Mothers also were told that the purpose of the research was to determine which behaviors are most likely to co-occur in children who are displaying either anxious or oppositional behaviors. After the mothers’ gave verbal consent to participate, research assistants took the required contact information (telephone number and address), and each mother was given a personal login ID and code to access the study via the Internet. No identifying information (such as names or contact information) was collected via the Internet, and only the participant login ID was attached to the computer file. Mothers were given instructions as to how to access the website, and were told that the study would take approximately an hour to complete. Participants then accessed and completed the website at their leisure. The website included a consent page that mothers were asked to print out for their information, a general family information section to
collect SES and ethnicity information, and eight scenarios describing children acting in either an anxious (four scenarios) or oppositional (four scenarios) manner, each followed by a rating form. Following the scenarios and ratings, mothers were asked to complete two scales from the Brief Symptom Inventory, a commonly used self-administered measure reflecting the mother’s level of psychopathology, as well as the CBCL regarding their own child’s behaviors. Both measures were collected to determine and potentially control for the effects either parental psychopathology or experience with childhood psychopathology may have on the mothers’ ratings of the child behaviors in the scenarios. Participants were mailed $10 for their time after completing the measures online. All mothers were treated in accordance with the Tri-Councils’ standards concerning the ethical treatment of human participants and the standards outlined by our university’s ethics committee, and was approved by this committee prior to the commencement of data collection.

2.1.3 – Scenarios and Ratings. (See Appendix I for samples of scenarios). Eight written scenarios were created, describing children between the ages of 7 to 10 years displaying behaviors consistent with either a diagnosis of SAD or ODD. The behaviors used in these scenarios were taken from three commonly used child behavior measures that tap ODD and/or SAD; the ODD Rating Scale (Hommersen et al., 2006), the SCAS (Spence, 1998), and the CBCL Anxiety/Depression and Aggression scales (Achenbach & Rescorla, 2001). Items from these measures were first separated into those that were considered to reflect Pure Anxiety, Ambiguous Anxiety, Ambiguous Oppositional, and Pure Oppositional behaviors. In order to separate items into these four behavior categories, 17 clinical psychologists, professors of clinical psychology, and clinical
psychology graduate students were asked to rate how representative the 45 items from these measures were of either SAD or ODD. Each behavioral item was rated on an 8-point scale, with 1 being the anchor for the behavior being characteristic only of children with SAD and 8 being the anchor for the behavior being characteristic only of children with ODD. Ratings for each item were averaged, and the item’s overall average and modal response were used to separate the items into the four categories. Items with averages ranging between 1 and 2.5 were considered to be Pure Anxiety items if their modal response was a 1 or 2, those with averages ranging between 2.5 and 4.5 were considered Ambiguous Anxiety items if their modal response was 3 or 4, those with averages ranging between 4.5 and 6.5 were considered Ambiguous Oppositional items if their modal response was 5 or 6, and those with averages between 6.5 and 8 were considered Pure Oppositional items if their modal response was a 7 or 8 (see Table 2 for a listing of the items in each category). Two items were omitted. The first was from the ODD Rating Scale, “often argues with adults,” as this item had a mean rating of 6.59, but had multiple modes, 6 and 7. The second omitted item, “sudden changes in mood or feelings,” had a mean of 4.6 and a modal response of 5, but was negatively correlated with the other items forming the Ambiguous Oppositional category and reduced the internal consistency of the category. As these items did not seem to clearly fit within a specific category they were dropped from the study.

Of the remaining 43 items, the 10 items in the Pure Anxiety category had an overall mean rating of 1.93 ($SD = 0.66$), the 8 items in the Ambiguous Anxiety category had an overall mean rating of 3.14 ($SD = 0.67$), the 12 items in the Ambiguous Oppositional category had an overall mean rating of 5.41 ($SD = 0.64$), and the 13 items in
the Pure Oppositional category had an overall rating of 6.91 ($SD = 0.71$). By separating the items into these categories, the Pure Anxiety category included items that are considered to be pure exemplars of separation anxiety, such as "clings to adults or too dependent," whereas the Ambiguous Anxiety category included items that are considered to be representative of behaviors expected in children experiencing separation anxiety but which clinicians felt were less specific to that disorder, such as "cries a lot." Conversely, the Pure Oppositional category included items that are considered to be pure exemplars of oppositional defiant disorder, such as "often blames others for his/her misbehavior," whereas the Ambiguous Oppositional category included items considered to be characteristic of oppositional behaviors but which clinicians felt were less specific to that disorder, such as "demands a lot of attention." Internal consistencies for the ratings of items in the four categories made by the 17 judges were found to be high, .93 (Pure Anxiety), .79 (Ambiguous Anxiety), .85 (Ambiguous Oppositional), and .93 (Pure Oppositional).

To test for halo effects in ratings, a somatic problems scale was constructed using seven symptoms from the Somatic scale of the CBCL. The Somatic scale has the lowest correlation to the Anxiety/Depression and Aggression scales of the CBCL from which several of the anxiety and oppositional items were taken (Achenbach & Rescorla, 2001). Several of the Somatic scale items, such as "stomach aches," were not used, as these symptoms are part of the Separation Anxiety criteria (APA, 2000). Instead, items that have no apparent relationship with either anxiety or oppositional behaviors, such as "eye problems that are not corrected with glasses" and "aches or pains (not stomach or
headaches)," were used. These symptoms were presented in the item listings that mothers rated after each scenario, but they were never described in any of the scenarios.

The anxiety and oppositional items were used to compose the scenarios describing children showing several symptoms of either SAD or ODD. The children in the scenarios were all between the ages of 7 and 10, and identical scenarios were created using male or female children. Mothers were asked to read and rate scenarios of children whose gender matched that of their own child. Within the SAD scenarios, the children displayed four of the Pure Anxiety behaviors and four of the Ambiguous Anxiety behaviors; while similarly, the ODD scenarios described children displaying four Pure Oppositional behaviors and four Ambiguous Oppositional behaviors. Two random orders of the scenarios were created (Order A and B) to reduce the likelihood that the order in which each mother read the scenarios would have an effect on her ratings. Mothers of boys were randomly assigned to one of the orders for the boys' scenarios, and mothers of girls were randomly assigned to one of the orders of the girls' scenarios.

After reading each scenario, but without being able to refer back to the scenario, mothers were asked to rate the likelihood that the child in the scenario generally displays the behaviors in the four categories: Pure Anxiety, Ambiguous Anxiety, Ambiguous Oppositional, and Pure Oppositional. For example, a question they might be asked about the scenario would be: "How often do you believe the child in this scenario is angry and resentful?" In addition, mothers were asked to rate the likelihood of the seven non-related somatic problems. Mothers rated the presence of each behavior on a 6-point scale, from 0 to 5, with 0 (the behavior is not or very rarely present), 1 (the behavior is rarely present), 2 (the behavior is occasionally present), 3 (the behavior is present more often than not), 4
(the behavior is frequently present), and 5 (the behavior is very frequently present).
Within each scenario type (i.e., SAD and ODD), internal consistencies of the mothers’
ratings across the items in each behavior category (Pure Anxiety, Ambiguous Anxiety,
Ambiguous Oppositional, Pure Oppositional, and Somatic) were high, with Cronbach
alphas ranging between .91 and .98 (see Table 3). The ratings were averaged across the
items of each behavior category creating five scores for each scenario (Pure Anxiety,
Ambiguous Anxiety, Ambiguous Oppositional, Pure Oppositional, and Somatic), and
these were averaged across the four scenarios within each scenario type creating five
scores for the SAD scenarios and five scores for the ODD scenarios.

**2.1.4 – Brief Symptom Inventory.** The Brief Symptom Inventory (BSI;
Derogatis, 1993) is a brief form of the Symptom Checklist (SCL-90-R), which is a self-
report inventory used in a variety of settings to assess psychological symptoms in
psychiatric, medical and community non-patients. The BSI consists of 53 items that are
rated on a 5-point scale of distress, ranging from 0 (not at all) to 4 (extremely). Mothers
were asked to rate how much the specific problem has caused them distress over the past
month, and the scores are converted into T-scores. This study used two of the BSI
subscales: Anxiety and Hostility.

Reliability and validity tests of the BSI have shown satisfactory results, and the
measure has been used among adult psychiatric outpatients, adult psychiatric inpatient,
and adult non-patients (Derogatis, 1993). The internal consistency coefficients in a
sample of 719 psychiatric outpatients were .81 for the Anxiety scale and .78 for the
Hostility scale (Derogatis, 1993). The internal consistencies in the sample of mothers in
this study were .84 for the Anxiety scale and .79 for the Hostility scale. Test-retest
reliability over a 2-week period for 60 non-patients was assessed and found to be .79 for
the Anxiety scale and .81 for the Hostility scale (Derogatis, 1993). The BSI has had
extensive validation over the last several decades and is a well-accepted instrument
(Francis, Rajan, & Turner, 1990; Morlan & Tan, 1998). The Anxiety and Hostility scales
from the BSI were used to collect information to determine if maternal anxiety and
hostility are correlated with ratings of the scenarios, and to allow for control of these
effects if necessary.

2.1.5—Child Behavior Checklist. The CBCL (Achenbach & Rescorla, 2001) is a
standardized parent-rated measure commonly used in both childhood behavioral disorder
research and clinical practice. The measure consists of 113 items that describe behaviors
of children and adolescents, and the items are factored into syndrome scales. Parents are
asked to describe their child's behavior over the past 6 months by rating the items 2 (very
true or often true), 1 (somewhat true), or 0 (not true). For this study, the
Anxiety/Depressed and Aggression syndrome scales were used. Raw scores on these
scales were used in the analyses to allow for greater variability as the T-scores generated
for the measure truncate all low scores as a T-score of 50 (Achenbach & Rescorla, 2001).

The CBCL syndrome scales were created based on a factor analysis of parent-
rated items for a large group of children. In validating the measure, a single interviewer
interviewed 72 mothers of non-referred children twice over a 1-week period in order to
measure the test-retest reliability and internal consistencies for the CBCL. The test-retest
reliabilities for the syndrome scales are considered to be high, .82 for the
Anxiety/Depression scale and .90 for the Aggression scale. The internal consistency
scores for the syndrome scales also are considered to be high, .84 for the
Anxiety/Depression scale and .94 for the Aggression scale. The content and criterion-related validity of the CBCL have been strongly supported through 4 decades of research and refinement, and it has been shown to discriminate significantly between demographically similar referred and non-referred children (Achenbach & Rescorla, 2001). In this study, mothers were asked to complete the CBCL for their own child after completing the scenarios and ratings. This information was used to ascertain the amount of exposure mothers had previously had with these behaviors, and to determine if this experience was related to their ratings of the behaviors in each scenario.

2.2 – Results

2.2.1 – Data Inspection. Data were first inspected for entry errors, missing values, and the distributions of the variables. As stated above, the 54.14% of mothers who were included in the study had completed all measures. Only a small percentage of mothers (6.9%) had missed items in rating the scenarios, and no mother had missed more than one response per behavioral category per scenario. Due to the high internal consistency for the behavioral categories, missing values were pro-rated by using the average of that mother's responses for that behavioral category on that particular scenario. The range of responses for each of the measures was not restricted (see Table 4, 5, and 6 for the means and standard deviations of each variable). The distribution of the data on each variable was assessed using Shapiro-Wilk tests of normality. The tests indicated that of the variables (10 behavior categories, the two BSI scales, and the two CBCL scales) only two, the SAD scenario Ambiguous Oppositional ratings and the ODD scenario Ambiguous Anxiety ratings, were distributed normally. However, the results of ANOVA and t-tests have been found to be robust to violations of the normality
assumption when \( n \) is moderate and the data are not highly skewed (Glass & Hopkins, 1996). Inspection of skewness and kurtosis revealed that the maternal behavioral category ratings had skewness ranging between -1.2 and 1.0, with a standard error of 0.3, and kurtosis ranging between -1.1 and 1.2, with a standard error of 0.6. Generally acceptable levels of skewness and kurtosis are those that when divided by their standard error fall between -2 and 2 (Cohen, 1988; Tabachnick & Fidell, 2001), so the kurtosis for these variables are considered to be within the acceptable range. However, several of the variables were significantly skewed. Transformations of the data were attempted to correct for the skew. However, as many of the variables appeared to have a ceiling or floor effect, the transformations did not significantly improve the level of skew. As the attempt to correct the skew did not improve the normality of the distributions, the original untransformed data were used in the following analyses. As this may increase the risk of Type 1 error (Delucchi & Bostrom, 2004), alphas were lowered to .01 for the tests of the main hypotheses in order to remain conservative.

2.2.2 – Order Effects. Several \( t \)-tests were used to ensure there were no differences between mothers who were assigned to the two orders of scenarios. The results showed no significant differences between the groups in terms of gender, SES, child age, maternal age, the BSI anxiety and hostility scales, or the CBCL anxiety and aggression scales (all \( p \) values were greater than .25). Similarly, there were no significant differences between the two groups of mothers in their ratings of the behavior categories for the SAD scenarios or for the ODD scenarios (\( p \) values were greater than .10), with the exception that mothers who were assigned to order A rated the Pure Anxiety and Ambiguous Anxiety behaviors as being less likely to occur in children described as
having ODD symptoms (the mean for the Pure Anxiety items was 1.26 and the mean for
the Ambiguous Anxiety items was 1.93) than those mothers who were assigned to order
B (the mean for the Pure Anxiety items was 1.78, \( t(70) = -2.21, p = .03, d = .53 \) (medium
effect), and the mean for the Ambiguous Anxiety items was 2.48, \( t(70) = -2.43, p = .02, 
\)
\( d = .58 \) (medium effect)). However, the overall pattern of the results remained the same in
these two groups, as did the range of responses. Therefore, the data from the mothers
assigned to two orders were combined for the remainder of the analyses.

2.2.3 - Child Gender Effects. Several \( t \)-tests also were used to determine
whether the ratings of the behavior categories in the scenarios were different for mothers
of boys versus mothers of girls, and whether there were any differences between the
gender groups in terms of child age, maternal age, SES, the BSI anxiety and hostility
scales, or the CBCL anxiety and aggression scales. There were no significant differences
found between the ratings of mothers of girls and boys for the five behavior categories
for either SAD scenarios or for the ODD scenarios (all \( p \) values were greater than .20).
There were no significant differences between the two gender groups in terms of child
age, maternal age, SES, either of the CBCL scales, or the BSI hostility scale (all \( p \) values
were greater than .10). There was a difference on the BSI anxiety scale, with mothers of
boys reporting slightly higher levels of anxiety than mothers of girls (a mean T-score of
56.98 for mothers of boys compared to 52.47 for mothers of girls, \( t(70) = 2.15, p = .04, d 
\)
\( = .51 \) (medium effect)). However, as this difference was the only significant difference
among the seven control variables tested, and both of these T-scores are within the
normal range on this measure, the mothers of boys and girls were combined for the
remainder of the analyses.
2.2.4 – Correlations Between Ratings of Behaviors in the Scenarios, Child Age, Maternal Age, and Socioeconomic Status. Pearson correlations were used to determine whether maternal ratings of the behaviors in the scenarios would be related to the age of their own child, their age, or their SES. There were no significant relationships between the ratings of the behaviors in the scenarios and maternal age or SES (all $p$ values were greater than .05). However, there were significant correlations between the ratings of the Pure Oppositional items of the SAD scenarios and child age, with higher ratings on Pure Oppositional items being related to older children (see Table 7 for the correlations). Child age was, therefore, added as a covariate to the following analyses to control for the relationships between child age and the maternal perceptions of the behaviors in the scenarios.

2.2.5 – Correlations Between Ratings of Behavior Categories in the Scenarios and the BSI. Ratings of maternal psychopathology were obtained using two BSI scales: the Anxiety scale and the Hostility scale (see Table 8). Pearson correlations were used to determine whether maternal ratings of the behaviors in the scenarios were related to the level of maternal psychopathology, specifically anxiety and hostility. There were no significant correlations between the ratings mothers made for either the SAD or the ODD scenarios and their scores on the BSI hostility subscale (see Table 8). However, there were significant correlations between the BSI anxiety subscale scores and the ratings of the Pure Oppositional items of the SAD scenarios, and the Pure Anxiety and Somatic items of the ODD scenarios. These suggest that the level of anxiety in mothers is positively related to their ratings of the items in the scenarios. As such, the BSI anxiety scale was added as a covariate to the following analyses.
2.2.6 – Correlation Between Ratings of Behavior Categories in the Scenarios and the CBCL. Ratings of childhood anxiety and aggression were obtained using the CBCL Anxiety and Aggression scales (see Table 9). Pearson correlations were used to determine whether maternal ratings of the behaviors in the scenarios were related to the presence of psychopathology in their own child. There were no significant correlations between the ratings mothers made for either the SAD or the ODD scenarios and the ratings of their own child’s anxiety and aggression on the CBCL (see Table 9). This suggests that there is no significant relationship between the mothers’ perceptions of the behaviors in the scenarios and the presence of psychopathology in their child.

2.2.7 – Differences Among Ratings of the Behavior Categories for the SAD Scenarios. There are three hypotheses being tested for the SAD scenarios. The first is that mothers are able to distinguish between the anxiety and oppositional items, and therefore will rate the child as significantly more likely to show both pure and ambiguous anxiety symptoms, which are presented in the scenario, than the oppositional items, both pure and ambiguous, which are not presented in the SAD scenarios. The second hypothesis being tested is the ambiguous behavior hypothesis. This hypothesis suggests that the ambiguous items listed on the ratings scale would be inappropriately endorsed due to the lack of meaningful context in which they are given. Thus, this hypothesis would be supported if the Ambiguous Anxiety items were rated as significantly less likely than the Pure Anxiety items, as they are both included in the SAD scenarios to equal degrees, and if the Ambiguous Oppositional items are endorsed as more likely than the Pure Oppositional items, despite neither being included in the SAD scenarios. The final hypothesis is the negative halo hypothesis, that mothers are more likely to endorse
any type of non-specific symptom among children portrayed with anxiety symptoms. This hypothesis would be supported if mothers rated the Ambiguous Oppositional items and the Somatic items as being similarly likely.

A repeated-measures ANOVA, with the behavior categories as the within subjects variable and child age and maternal anxiety as covariates, was used to compare the average rating for each behavioral category (Pure Anxiety, Ambiguous Anxiety, Ambiguous Oppositional, Pure Oppositional, and Somatic) for the SAD scenarios. The Mauchly’s test of sphericity was significant, therefore the Greenhouse-Geisser correction of the degrees of freedom was used to control for any increased chance of Type 1 error. The omnibus F test was significant for the main effect of behavior category, $F(2.41, 166.59) = 6.20, p = .001$, partial eta squared = .08 (small effect). There was a significant interaction between the behavior category and the maternal level of anxiety, $F(2.41, 166.59) = 5.58, p = .003$, partial eta squared = .08 (small effect). Therefore, a median split was used to separate the mothers into high anxiety and low anxiety groups to further test whether the main effect of behavioral category would be significant in each group, and whether the maternal ratings of the behavioral categories would be in the same direction in the two groups. The main analysis was significant for each group, and the pattern of results for the behavior categories was the same. Therefore, mothers displaying higher levels of anxiety were combined with those displaying lower levels of anxiety prior to conducting the post-hoc analyses.

Four post-hoc pairwise comparisons were performed between 1) Ambiguous Anxiety and Ambiguous Oppositional, 2) Pure Anxiety and Ambiguous Anxiety, 3) Ambiguous Oppositional and Pure Oppositional, and 4) Ambiguous Oppositional and
Somatic, with alpha being set at .01 in order to control for family wise error (see Table 4 for ranges, means, and standard deviations). As noted above, due to the significant degree of skewness, the alphas were lowered to .01 in order to remain conservative.

The first post-hoc test was designed to compare mothers' ratings of the anxiety symptoms versus the oppositional symptoms. Means for the Ambiguous Anxiety and Ambiguous Oppositional symptom categories were closest (with the pure categories being even more distinct), therefore the difference between means of the two ambiguous categories were tested. This test showed that anxiety symptoms were rated as significantly more likely than the oppositional symptoms, \( t(71) = 21.79, p < .001, d = 2.60 \) (large effect). This difference supports the first hypothesis, indicating that the mothers were able to distinguish between items that reflect anxiety symptoms, which were presented in the scenarios, and the items that reflect oppositional symptoms, which were not presented in the scenarios.

The next two post-hoc tests were used to test whether the ambiguous items were rated differently than pure items. There were significant differences found between the ratings of the Pure Anxiety behaviors and the ratings of the Ambiguous Anxiety behaviors, \( t(71) = 4.53, p < .001, d = .53 \) (medium effect), with the Ambiguous Anxiety items being rated as significantly less likely than the Pure Anxiety items. A similar difference was found between the ratings of the Ambiguous Oppositional behaviors and the ratings of the Pure Oppositional behaviors, \( t(71) = 15.40, p < .001, d = 1.81 \) (large effect), although in this case the Ambiguous Oppositional items were rated as significantly more likely than the Pure Oppositional items. This pattern follows the ambiguous behavior hypothesis, suggesting that the ambiguous items tend to be
problematic for mothers in that they are less likely to rate ambiguous behaviors when they are consistent with the presenting disorder than they are to rate pure symptoms. Additionally, this pattern of results suggests that mothers endorse the ambiguous behaviors that are inconsistent with the presenting disorder to a significantly greater extent than the pure symptoms of the other disorder.

The final post-hoc comparison was between the Ambiguous Oppositional items and the Somatic items, and was used to test the negative halo hypothesis. The Somatic items were endorsed with a moderate frequency and were not rated significantly different than the Ambiguous Oppositional items, $t (71) = .47, p = .64, d = .06$ (no effect). These results support the negative halo hypothesis, and suggest that for children described with anxiety symptoms mothers may perceive the children as being more likely to show multiple non-specific problems, even when those problems are not expressed in the given scenario.

2.2.8 – Differences Among Ratings of the Behavior Categories for the ODD Scenarios. There are also three hypotheses that are tested for the ODD scenarios. The first is that mothers are able to distinguish between the oppositional and anxiety items, and therefore will rate the child as significantly more likely to show both pure and ambiguous oppositional symptoms, which are presented in the scenarios, as being significantly more likely than the anxiety symptoms, both pure and ambiguous, which are not presented in the scenarios. The second hypothesis is the ambiguous behavior hypothesis. This suggests that the ambiguous items listed on the ratings scale will be inappropriately endorsed due to the lack of meaningful context in which they are given. Thus, this hypothesis would be supported if the Ambiguous Oppositional items were
rated as significantly less likely than the Pure Oppositional items, despite being both included in the ODD scenarios to equal degrees, and if the Ambiguous Anxiety items are endorsed as more likely than the Pure Anxiety items, despite neither being included in the ODD scenarios. Again, the final hypothesis being tested in this scenario is the negative halo hypothesis, that mothers are more likely to endorse any type of non-specific symptom among children portrayed with oppositional symptoms. This hypothesis would be supported if mothers rated the Ambiguous Anxiety items and the Somatic items as being similarly likely.

A repeated-measures ANOVA, with the behavior categories as the within subjects variable and child age and maternal anxiety as covariates, was used to compare the average rating for each behavioral category (Pure Oppositional, Ambiguous Oppositional, Ambiguous Anxiety, Pure Anxiety, and Somatic) for the ODD scenarios. The Mauchly’s test of sphericity was significant, therefore the Greenhouse-Geisser correction of the degrees of freedom was used to control for any increased chance of Type 1 error. The omnibus $F$ test was significant for the main effect of behavior category, $F(1.89, 130.70) = 6.33, p = .003$, partial eta squared = .08 (small effect). There was a significant interaction between the behavior category and the maternal level of anxiety, $F(1.89, 130.70) = 8.28, p = .001$, partial eta squared = .11 (medium effect). Therefore a median split was again used to separate the mothers into high anxiety and low anxiety groups to further test whether the main effect would be significant would be significant in each group, and whether the maternal ratings of the behavioral categories would be in the same direction. The main analysis was significant for each group, and the pattern of results for the behavior category was the same. Therefore, mothers displaying higher
levels of anxiety were combined with those displaying lower levels of anxiety prior to conducting the post-hoc analyses.

Four post-hoc pairwise comparisons were performed between 1) Ambiguous Oppositional and Ambiguous Anxiety, 2) Pure Oppositional and Ambiguous Oppositional, 3) Ambiguous Anxiety and Pure Anxiety, and 4) Ambiguous Anxiety and Somatic, with alpha being set at .01 in order to control for family wise error (see Table 5 for ranges, means, and standard deviations). As in the analyses above, the alphas were lowered to .01 in order to remain conservative due to non-normality of the data.

The first post-hoc test was designed to compare mothers' ratings of the oppositional symptoms versus the anxiety symptoms. As the means for the Ambiguous Oppositional and Ambiguous Anxiety symptom categories were closest (with the pure categories being even more distinct), the difference between means of the two ambiguous categories were tested. This test found that for the ODD scenarios the oppositional symptoms were rated by mothers as being significantly more likely than the anxiety symptoms, $t(71) = 14.20, p < .001, d = 1.67$ (large effect). This supports the first hypothesis and indicates that the mothers were again able to distinguish between items that reflect oppositional symptoms, which were presented in the scenarios, and the items that reflect anxiety symptoms, which were not presented in the scenarios.

For the second hypothesis, two post-hoc tests were used to test whether the ambiguous items were rated differently than pure items. There were significant differences found between the ratings of the Pure Oppositional behaviors and the ratings of the Ambiguous Oppositional behaviors, $t(71) = 4.11, p < .001, d = .48$ (medium effect), with the Ambiguous Oppositional items being rated as significantly less likely
than the Pure Oppositional items. The reverse difference was found between the ratings of the Ambiguous Anxiety items and the ratings of the Pure Anxiety items, \( t(71) = 12.52, p < .001, d = 1.48 \) (large effect), with the Ambiguous Anxiety items rated as significantly more likely than the Pure Anxiety items. This pattern follows the ambiguous behavior hypothesis, suggesting that the ambiguous items tend to be more problematic for mothers in that they are less likely to rate ambiguous behaviors when they are consistent with the presenting disorder than they are to rate pure symptoms. Additionally, this pattern of results suggests that mothers endorse the ambiguous behaviors that are inconsistent with the presenting disorder to a significantly greater extent than the pure symptoms of the other disorder.

The final post-hoc comparison was between the Ambiguous Oppositional items and the Somatic items, and was used to test the negative halo hypothesis. The Somatic items were rated as significantly less likely to co-occur with children described with oppositional difficulties than the Ambiguous Anxiety items, \( t(71) = 20.38, p < .001, d = 1.20 \) (large effect). These results do not support the negative halo hypothesis, suggesting that for children described with oppositional symptoms mothers do not necessarily perceive the children as being more likely to show multiple non-specific problems, but rather that there are particular behaviors, such as the ambiguous anxiety items, that mothers tend to perceive as more likely to co-occur with oppositional symptoms.

2.2.9 – Exploratory Analyses of Differences in Ratings Between SAD and ODD Scenarios. Exploratory analyses were conducted to determine whether mothers responded differently to the SAD and ODD scenarios. Four paired \( t \)-tests were used to test differences between a) the pure items that were consistent with the disorder being
described (i.e., Pure Anxiety for the SAD scenarios and Pure Oppositional for the ODD scenarios), b) the ambiguous items that were consistent with the disorder being described, c) the ambiguous items that were inconsistent with the disorder being described, and d) the pure items that were inconsistent with the disorder being described. It was found that mothers always rated the anxiety items as significantly more likely than the corresponding oppositional items (all p values were less than .005). For example, Pure Anxiety items for the SAD scenarios were rated as significantly more likely to occur than the Pure Oppositional items for the ODD scenarios, \( t(71) = 3.89, p < .001, d = .46 \) (medium effect), despite the scenarios describing the presented disorder in the same manner, each having four pure symptoms and four ambiguous symptoms. This also was the case for the ratings of the items that were inconsistent with the presented disorder, where Pure Oppositional for the SAD scenarios were rated as significantly less likely than the Pure Anxiety items for the ODD symptoms, \( t(71) = -7.01, p < .001, d = .83 \) (large effect).

Additionally, the main results above suggested that for children described with anxiety symptoms, mothers were more likely to perceive the children as having multiple non-specific problems, whereas mothers did not perceive the children described with oppositional behaviors as having the same degree of non-specific unrelated problems. To further explore this difference, the ratings of the Somatic items between the two scenario types were compared using a paired \( t \)-test. The results found that mothers did indeed endorse the Somatic items significantly more often for the SAD scenarios than they did for the ODD scenarios, \( t(71) = 4.35, p < .001, d = .51 \) (medium effect). This further supports the negative halo hypothesis for mothers’ perceptions of children described with...
anxiety symptoms, but not for the mothers' perceptions of children displaying oppositional symptoms.

2.3 – Discussion

In this first study, there are several hypotheses that were tested. The first hypothesis is that mothers are able to discriminate SAD versus ODD behaviors. The second, the ambiguous behavior hypothesis, is that there exist ambiguous item describing SAD and ODD behaviors and that these ambiguous behaviors are more likely to be rated by mothers as co-occurring among children described with the opposite disorder, and therefore there is an increased degree of overlap between the two disorders. The third hypothesis, the negative halo hypothesis, is that mothers are likely to rate any non-specific psychopathological problems as more likely to occur among children described with either disorder. Somatic problems were included in the list of problems that mothers rated in order to assess this hypothesis.

Before testing the various hypotheses, the internal consistencies of mothers' ratings of the items for the behavioral categories were assessed and found to be strong. The mothers' perceptions of the behaviors in the scenarios also were not found to be significantly related to the gender of the child described in the scenario, the SES of their family, the age of the mothers, the level of maternal hostility reported on the BSI, or the level of anxiety and aggression that they described in their own child on the CBCL. Factors that were found to be significantly related to mothers' perceptions of the behaviors in the scenarios were the age of the mother's own child and the level of anxiety that they were themselves experiencing as reported on the BSI. These factors were entered into the main analyses as covariates. Of these covariates, none exerted significant
main effects in the analyses, and although maternal anxiety interacted with the type of behavior being rated, the pattern of difference among the behavioral categories was the same in both high and low anxiety mothers.

In assessing the three proposed hypotheses concerning mothers' perceptions of SAD and ODD behaviors, it is important to look at the overall patterns of results for both the SAD and ODD scenarios. First, for scenarios describing children with SAD, mothers were able to detect and rate the anxiety symptoms (average rating of 4.01 on a 6-point scale for Pure Anxiety and 3.86 for Ambiguous Anxiety), and these were rated significantly higher than the oppositional symptoms (average rating of 0.97 on a 6-point scale for Pure Oppositional and 1.80 for Ambiguous Oppositional). The reverse was also true for the ODD scenarios; the oppositional items (average rating of 3.83 on a 6-point scale for Pure Oppositional and 3.71 for Ambiguous Oppositional) were rated significantly higher than the anxiety symptoms (average rating of 1.52 on a 6-point scale for Pure Anxiety and 2.20 for Ambiguous Anxiety). These results fit with the first hypothesis, that mothers are able to distinguish between anxiety symptoms and oppositional symptoms when presented with an anxiety scenario, and also are able to distinguish between oppositional symptoms and anxiety symptoms when presented with an oppositional scenario. This pattern of results is expected and reassuring, as clinicians routinely ask parents, and mothers in particular (Treutler & Epkins, 2003), to identify behaviors in their children in order to aid in the diagnostic process. However, in addition to this overall accuracy, mothers did endorse some symptoms of the opposite disorder for each scenario, despite the fact that these behaviors were never portrayed in the scenarios. This suggests that, although mothers were able to generally distinguish between the items
that reflect anxiety or oppositional items in each scenario type, there are some items that tend to be inappropriately endorsed, whether due to the ambiguous nature of the behaviors or due to negative halo effects.

One of the novel aspects of this study was the ability to test the ambiguous behavior hypothesis, whether the maternal ratings of ambiguous behaviors of the disorder consistent with the scenario would differ from the ratings of the pure exemplars of the consistent disorder. This hypothesis also suggests that mothers would perceive the ambiguous behaviors of the disorder that was inconsistent with the one described in the scenario as more likely to occur than the pure exemplars of the inconsistent disorder. For the SAD scenarios, mothers endorsed the ambiguous anxiety items as significantly less likely than the pure anxiety symptoms, despite the scenarios always containing the same number of pure and ambiguous items. Most importantly, mothers reported that the ambiguous oppositional items were significantly more likely to co-occur in these children than the pure oppositional symptoms, despite neither of these behaviors ever having occurred in the SAD scenarios. This pattern of results demonstrated that, due to the ambiguous nature of some of the behavioral items that are commonly used in parent-rated questionnaires, there is the potential for children displaying SAD behaviors to be perceived as having some level of ODD behaviors due to the endorsement of the ambiguous ODD behaviors. Similar results were found for the ODD scenarios. In these scenarios, mothers rated the ambiguous oppositional items as being significantly less likely to occur than the pure symptoms, despite the scenarios always containing the same number of pure and ambiguous items. Also, mothers reported that the ambiguous anxiety items were significantly more likely to occur than the pure anxiety symptoms, despite
neither of these having been described in the ODD scenarios. Therefore, mothers
discriminated well between the “pure” exemplars of each behavior type, but showed less
differentiation in their ratings of the ambiguous behaviors. This occurred whether the
scenario was describing a child with SAD or with ODD, and suggests that, at least to
some extent, the degree of comorbidity between separation anxiety and oppositional
defiant behaviors may be explained by the likelihood of mothers endorsing non-specific
or ambiguous behaviors representing the two disorders.

On closer examination there is some suggestion that the reasons for a mother’s
tendency to endorse ambiguous behaviors may be somewhat different when children are
displaying anxious behaviors than when they are displaying oppositional symptoms.
When rating behaviors for the SAD scenarios, mothers rated the Somatic symptoms as
being occasionally likely to co-occur (average of 1.74 on a 6-point scale), and their
ratings of Somatic symptoms in these scenarios were not significantly different than their
rating of the Ambiguous Oppositional items (average of 1.80 on a 6-point scale). This
finding is consistent with the hypothesis of a negative halo bias in that mothers appear
more likely to endorse any type of non-specific symptom among children portrayed with
anxiety symptoms. This pattern was different for the ODD scenarios, however. Mothers
rated the Somatic behaviors (average of 1.40 on a 6-point scale) as being significantly
less likely to co-occur with children displaying oppositional behaviors than the
Ambiguous Anxiety behaviors (average of 2.20 on a 6-point scale). This suggests that it
is the Ambiguous Anxiety behaviors, and not merely all non-specific behaviors as would
be expected in the negative halo hypothesis, which mothers perceive as more likely to co-
occur among children who are described with oppositional symptoms. These differences
are also highlighted by the exploratory finding of the difference in ratings between the Somatic items on the SAD scenarios compared to the ODD scenarios. Here, again, it was found that mothers tended to rate the non-specific Somatic items as being significantly more likely to occur among children described with anxiety problems than those with oppositional difficulties. Thus, it appears that both the negative halo hypothesis and the ambiguous behavior hypothesis may apply to the maternal ratings of the anxiety scenarios, but only the ambiguous behavior hypothesis applies to the maternal ratings of the oppositional scenarios. A possible explanation for this difference may be in the attributions mother make regarding children displaying anxious behaviors compared to those displaying oppositional behaviors. Mothers may, for example, view anxious children as more vulnerable and likely to react negatively to a variety of experiences (Prinstein, Cheah, & Guyer, 2005), or to be subject to a variety of problems, including somatic symptoms (Ginsburg, Riddle, & Davies, 2006). On the other hand, mothers may view children who are oppositional and aggressive as being instigators (Crick & Dodge, 1994), and therefore more in control of themselves and less likely to be impacted by environmental events. They may, therefore, be less likely to report these children as experiencing other types of difficulties.

To further expand on the differences between maternal perceptions of children described with anxiety symptoms compared to oppositional symptoms, exploratory analyses were conducted and these found that mothers tended to endorse anxiety behaviors as being generally more likely to occur compared to corresponding oppositional behaviors (e.g., the Pure Anxiety items in the SAD scenarios were rated as being significantly more likely than the Pure Oppositional items in the ODD scenarios).
While this likely had little impact on the main findings of this study, since the primary focus of this study was to look at the pattern of endorsement within each scenario type and not across the scenario types, the reasons for this exploratory finding are unfortunately not testable by the design of the current study. It is possible that there is a general rating difference due to how the various items are presented in the scenarios, and this may be an area for future research.

Although the results of this analogue study suggest that mothers may inappropriately endorse ambiguously worded behavioral descriptions of disorders that are not presented in descriptions of hypothetical children, it is difficult to know whether mothers would experience similar difficulties when they are asked to report the occurrence of these symptoms in their own children. Therefore, the second study was conducted using a clinical population and ratings of child behavior that had already been completed for the purpose of a clinical assessment.
Chapter III – Experiment 2

This second experiment used archival data from a provincially-funded treatment and assessment centre in order to examine the correlation between the behavioral ratings of SAD and ODD behaviors as completed by both parents and youth, and whether this correlation was elevated by the presence of ambiguous behaviors. It is the purpose of this study to examine whether, using only the pure anxiety and oppositional items of a commonly used child behavior rating scale (on which the scales typically contain both the pure and ambiguous items), the degree of relatedness between the two disorders would decrease as etiological theories suggest.

3.1 – Method

3.1.1 – Participants. Archival data from CBCL and YSR forms (Achenbach & Rescorla, 2001) were reviewed from 219 clinical cases (159 of the cases contained both CBCL and YSR forms, 42 cases contained CBCL forms only, and 18 contained YSR forms only) of youth who were assessed in a 3-year period at a provincially-funded child and adolescent assessment facility. Data was collected for both males \( n = 146 \) and females \( n = 73 \) between the ages of 12 to 17 \( (M = 14.29 \text{ years}, \ SD = 1.48 \text{ years for boys, and } M = 14.52 \text{ years}, \ SD = 1.56 \text{ years for girls}) \). The SES of families had been recorded in the clinical file for 90% of the cases using the Hollingshead’s 9-step scale for parental occupation (Hollingshead, 1975). Based on the higher-status occupation in each household, 3.6% of families were described as upper class, 27.4% as upper middle class, 66.0% as lower middle class, and 3.0% as lower class. Of the 92.5% of parents who reported their relationship to the youth on the CBCL, most were the youth’s biological
mother (63.7%); although some were foster mothers (10.0%), biological fathers (9.5%),
adoptive mothers (5.0%), and others (4.5%; e.g., child care workers, foster fathers, etc.).

3.1.2 – Procedure. This study involved accessing files for youth and recording
the individual item scores on scales of the CBCL and YSR. Prior to their admission to the
facility, all children and parents were asked to sign consent forms that included consent
to use information gathered during the assessment for the purposes of research. The
assessment then took place over the course of 3 to 4 weeks, during which time the parents
and youth are asked to complete the CBCL and YSR, respectively.

All data were collected in accordance with the Tri-Councils’ standards concerning
the ethical treatment of human participants and the standards outlined by the University
of British Columbia ethics committee, and approval for this study was obtained from the
University of British Columbia ethics committee prior to the commencement of data
collection. Approval also was sought and granted from a review committee at the
provincial facility.

3.1.3 – Child Behavior Checklist. The CBCL (Achenbach & Rescorla, 2001) is a
standardized parent-rated measure commonly used in both childhood behavioral disorder
research and clinical practice (see Study 1 for a more complete description of the
measure). The test-retest reliabilities for the scales that were used in Study 2 are
considered to be high: .82 for the Anxious/Depressed scale and .90 for the Aggression
scale, and .80 for the Anxiety and .85 for the ODD DSM-oriented scales (Achenbach &
Rescorla, 2001). The internal consistency scores also are considered high: .84 for the
Anxious/Depressed scale and .94 for the Aggression scale, and moderate to high for the
DSM-oriented scales: .72 for the Anxiety scale and .86 for the ODD scale (Achenbach &
Rescorla, 2001). The internal consistency scores for this sample were similar to the
normative sample, and are considered high for the empirical syndrome scales: .80 for the
Anxious/Depressed scale and .90 for the Aggression scale, and moderate to high for the
DSM-oriented scales: .73 for the Anxiety scale and .81 for the ODD scale.

3.1.4 – Youth Self Report. The YSR (Achenbach & Rescorla, 2001) is a
standardized youth self-report measure commonly used in both childhood behavioral
disorder research and clinical practice. The measure consists of 112 items that describe
behaviors of children and adolescents, and the items are factored into syndrome scales.
Youth are asked to describe their behavior over the past 6 months by rating an item as a 2
(very true or often true), a 1 (somewhat true), or a 0 (not true). The content and criterion-
related validity of the YSR have been strongly supported through several decades of
research and refinement, and it has been shown to discriminate between demographically
similar referred and non-referred children (Achenbach & Rescorla, 2001).

In validating the measure, 89 youth were reassessed over a period of 1 to 2 weeks.
The test-retest reliabilities for the empirically based syndrome scales used in this study
are considered to be moderate to high: .74 for the Anxious/Depressed scale and .88 for
the Aggression scale (Achenbach & Rescorla, 2001), as they are for the DSM-oriented
scales: .68 for the Anxiety scale and .85 for the ODD scale (Achenbach & Rescorla,
2001). The internal consistency scores for the empirically based syndrome scales are
considered high, .84 for the Anxious/Depressed scale and .90 for the Aggression scale;
whereas the DSM-oriented scales showed lower to moderate internal consistency scores,
.67 for the Anxiety scale and .70 for the ODD scale (Achenbach & Rescorla, 2001). The
internal consistency scores for this sample were similar to the normative sample, and are
considered high for the empirical syndrome scales: .84 for the Anxious/Depressed scale and .86 for the Aggression scale, and moderate for the DSM-oriented scales: .75 for the Anxiety scale and .75 for the ODD scale.

3.1.5 – Child Behavior Measures. On both the CBCL and the YSR, two of the empirically-based syndrome scales were used, the Aggression Problem scale (18 items for the CBCL and 17 items for the YSR), and the Anxious/Depressed scale (13 items for the CBCL and 12 items for the YSR), as well as two of the DSM-oriented scales, the ODD scale (5 items for both the CBCL and the YSR) and the Anxiety scale (6 items for both the CBCL and the YSR). The syndrome scales were created based on a factor analysis of items, while the DSM-oriented scales were rationally-created by grouping items from the CBCL into categories closely resembling the DSM-IV criteria for various disorders (Achenbach & Rescorla, 2001). Both the syndrome scales and the DSM-oriented scales are commonly used in the assessment of youth, and both were used in this study, as each includes slightly different behavioral symptoms, and because the correlations between the syndrome and DSM-oriented ODD and anxiety scales varies. Specifically, the empirically created syndrome scales contain a greater number of items than the DSM scales, and these items represent a broader array of behaviors. For example, the Anxiety/Depression scale includes not only SAD behaviors, but also those related to general internalizing problems and the Aggression scale includes not only behaviors characteristics of ODD, but also associated problems such as aggression. Conversely, the DSM-oriented scales were created with a theoretically driven focus, and therefore contain fewer items and a narrower scope that is more specific to behaviors characteristic of SAD and ODD.
As revealed by the clinical judgments gathered in Study 1, these four scales from the CBCL and YSR contain both pure and ambiguous items. Therefore, the CBCL and YSR items that were used to derive the Pure Anxiety (4 items) and Pure Oppositional (8 items) behavior categories in Study 1 were used to test whether using only the pure items of these scales would reduce the relationship between anxiety and oppositional symptoms, compared to when the full scales with both pure and ambiguous items are used. Total raw scores for each of the scales were used to allow for greater variability as the T-scores generated for the measure truncate all low scores as a T-score of 50 (Achenbach & Rescorla, 2001).

Internal consistencies were calculated for the Pure Ambiguous and Pure Oppositional scales for both the CBCL and YSR forms (see Table 10). The internal consistency for the parent rated Pure Oppositional items was high, and the youth rated Pure Oppositional items was moderate. The internal consistency for both the parent and youth rated Pure Anxiety items were lower. The scales were examined to ensure that alphas were not being lowered by one particular item, and it was found that the deletion of items did not increase the alphas of either the CBCL pure anxiety scale or the YSR pure anxiety scale, suggesting that all the items were in fact contributing to the scale.

3.2 – Results

3.2.1 – Data Inspection. Data were first inspected for entry errors, missing values, and the distributions of the variables. Due to the restricted number of items being used for the Pure Ambiguous and Pure Oppositional scales, data was collected only from files in which the caregivers and/or youth had fully completed the questionnaire, and as such there were no missing values needing to be pro-rated. As stated above, 159 of the
files contained complete information from both the CBCL and YSR, 42 files contained complete information from the CBCL only, and 18 files contained complete information from the YSR only. Thirty-one files were excluded due to the questionnaires missing data on either the CBCL or YSR. The range of responses for each of the measures was not restricted (see Table 11 for the ranges, means, and standard deviations of each variable). Finally, the distribution of the data on each variable was considered. Shapiro-Wilk tests of normality indicated that none of the variables had a normal distribution. However, the Shapiro-Wilk test of normality is a powerful test, and as the sample size grows larger even unimportant deviations from normality may become technically significant. The level of kurtosis revealed that all variables were mildly platykurtic, with a kurtosis ranging between -0.9 and 0 (with a standard error of kurtosis of 0.4), and were slightly skewed ranging between -0.5 and 0.7 (with a standard error of skewness of 0.2). Generally acceptable levels of skewness and kurtosis are those that when divided by their standard error fall between -2 and 2 (Cohen, 1988; Tabachnick & Fidell, 2001), so there was one variable that had a kurtosis falling slightly outside this range, and several of the variables were significantly skewed. However, a closer examination of the boxplots for the variables revealed that there were no outliers. As previous literature has found that correlations are remarkably robust to violations of the normality assumption (Zeller & Levine, 1974), no corrections to the data were made.

3.2.2 – Child Gender Effects. A t-test was first used to test for gender differences in age or SES of the youths. The results showed no significant differences between the genders in terms of youth age or SES (p values greater than .25). A t-test also was used to determine whether there were significant differences between the ratings
on the CBCL scales and between the ratings on the YSR based on the gender of the youths. The results for the CBCL showed there were no significant differences between the parents’ ratings of boys or girls on any of the CBCL scales (all \( p \) values were greater than .10). Therefore, the data from all parental ratings of both genders were combined for the remainder of the analyses. The results for the YSR showed that female youth reported significantly more anxiety behaviors than did the male youth on the YSR Anxious/Depressed problem scale, \( t (175) = -3.68, p < .001, d = .56 \) (medium effect), and on the Anxiety DSM-Oriented scale, \( t (175) = -2.27, p = .02, d = .34 \) (small but significant effect). There was a small, albeit not significant, difference between males and females on the youth ratings of the Pure Anxiety items, \( t (175) = -1.67, p = .10, d = .25 \) (small but not significant effect). There were no significant differences between the male and female youth in regards to their reporting of symptoms on the Aggression problem scale, the ODD DSM-scale, or the Pure Oppositional scale (\( p \) values greater than .10). Therefore, although the main analyses for the YSR were conducted with the genders combined, exploratory analyses were subsequently conducted to examine whether the correlations between the two syndrome scales of the YSR and between the pure item scales were different in boys and girls.

3.2.3 - Correlations Between Ratings on the CBCL and YSR, and Child Age and Socioeconomic Status. Pearson correlations were used to determine whether the age and SES of the youth were significantly related to the parents’ ratings of their child’s behaviors or the youths’ ratings of their own behaviors. The SES of the family was not related to the ratings made by either the parents or the youth (all \( p \) values were greater than .25). However, youth age displayed small negative relationships to the parent’s
ratings of their child's oppositional behavior, both on the Aggression scale of the CBCL, $r (200) = -0.17, p = .01$, and the ODD-DSM scale, $r (200) = -0.14, p = .05$. These suggest that parents are less likely to rate aggressive or oppositional behaviors in older children. Also, youth age was found to have a small positive relationship with the youth’s self reported anxiety on the YSR, both for the Anxiety/Depression scale, $r (176) = .18, p = .02$, and the Anxiety DSM-oriented scale, $r (176) = -0.23, p = .01$. This suggests that older youth are more likely to rate themselves as having anxiety symptoms. Given these significant relations, age was controlled in all subsequent correlations.

3.2.4 – Correlations Between Parent Ratings of Anxious and Aggressive Behaviors. Three correlations were calculated between parent-rated items, with age being partialled out of each (see Table 12). The Aggression and Anxiety/Depression syndrome scales, the ODD and Anxiety DSM-oriented scales, and the ODD and Anxiety pure scales were correlated with each other to assess the overlap when using scales that vary in the extent of pure and ambiguous items. While the three correlations were all significant, both the correlation between the syndrome scales and between the DSM scales can be considered medium correlations, while the correlation between the pure item scales is considered to be small (Cohen, 1988). However, in order to test whether these correlations were significantly different, they were first transformed into Fisher $z$-scores to be able to compare them using Steiger’s (1980) $Zbar^2*$ statistic. This statistic is used to test whether two dependent correlations are significantly different, and assumes there are four variables of interest. More specifically, this tests whether the correlation between Variables 1 and 2 is the same as the correlation between Variables 3 and 4.
The correlation between the parent-rated Pure Anxiety and Pure Oppositional items was first compared to the correlation between the Anxiety/Depression Problem scale and the Aggression Problem scale of the CBCL by calculating Steiger's (1980) \( Z_{\bar{b}^2} \) statistic. In this case, this test is a one-tailed test, as the expectation is that the correlation between the Pure Items will be significantly smaller than the correlation between the CBCL Anxiety/Depression and Aggression Problem scales. The absolute value of the \( Z_{\bar{b}^2} \) statistic for the difference between the two correlations was 5.33, \( p < .001 \) (large effect). This indicates that the correlation between the parent-rated Pure Items was significantly lower than the correlation between the ratings on the CBCL Anxiety/Depression and Aggression Problem scales. Therefore, the removal of the ambiguous symptoms reduced the amount of relatedness between parent-rated anxiety and oppositional symptoms.

The correlation between the parent-rated Pure Anxiety and Pure Oppositional items also was compared to the correlation between the Anxiety DSM-oriented scale and the Oppositional Defiant DSM-oriented scale again by transforming each into Fisher z-scores and calculating Steiger's (1980) \( Z_{\bar{b}^2} \) statistic. The test is again a one-tailed test, as the expectation is that the correlation between the Pure Items will be significantly smaller than the correlation between the CBCL DSM-Anxiety scale and the DSM-ODD scale. The absolute value of the \( Z_{\bar{b}^2} \) statistic for the difference between the correlations was 2.86, \( p = .002 \) (large effect). This indicates that the correlation between the parent-rated Pure Items was significantly lower than the correlation between the CBCL Anxiety and the Oppositional Defiant DSM scales. Therefore, again the removal
of the ambiguous symptoms reduced the amount of relatedness between parent-rated anxiety and oppositional symptoms.

3.2.5 – Correlations Between Youth Ratings of the Anxious and Aggressive Behaviors. Paralleling the analyses with parent CBCL scales, three correlations were calculated between the youth-rated items, with age being partialled out of each (see Table 13). While the three correlations were all significant, only the correlation between the syndrome scales was a medium correlation, while the correlations between the DSM scales and between the pure item scales were both considered to be small (Cohen, 1988). Again, in order to test whether these correlations were significantly different, they were first transformed into Fisher z-scores to be able to compare them using Steiger’s (1980) Zbar_2* statistic.

The correlation between the youth-rated Pure Anxiety and Pure Oppositional items was compared to the correlation between the Anxious/Depressed problem scale and the Aggression problem scale of the YSR by transforming each into Fisher z-scores and calculating Steiger’s (1980) Zbar_2* statistic. The test was a one-tailed test, as the expectation is that the correlation between the Pure Items will be significantly smaller than the correlation between the YSR Anxiety/Depression and Aggression Problem scales. The absolute value of the Zbar_2* statistic for the difference between the correlations was 2.13, p = .02 (large effect). This indicates that the correlation between the youth-rated Pure Items was significantly lower than the correlation between the Anxiety and Aggression Problem scales. Therefore, again the removal of the ambiguous symptoms reduced the amount of relatedness between youth-reported anxiety and oppositional symptoms.
The correlation between the youth-rated Pure Anxiety and Pure Oppositional items was compared the correlation between the Anxiety DSM-oriented scale and the Oppositional Defiant DSM-oriented scale of the YSR by transforming each into Fisher z-scores and calculating Steiger’s (1980) Zbar_2^* statistic. The test is again a one-tailed test, as the expectation is that the correlation between the Pure Items will be significantly smaller than the correlation between the YSR DSM-Anxiety scale and the DSM-ODD scale. However, the absolute value of the Zbar_2^* statistic for the difference was 0.32, \( p = .37 \) (small and not significant effect), and indicates that the correlation between the youth-rated Pure Items was not significantly different than the correlation between the youth-rated anxiety and the oppositional symptoms for this measure.

3.2.6 - Correlations Between Youth Ratings of the Anxious and Aggressive Behaviors by Gender. Due to the significant mean differences between the genders on the YSR Anxious/Depressed problem scale and the YSR Anxiety DSM-Oriented scale, exploratory analyses also were completed by creating separate correlations between the pure and empirical scales for each gender, with age partialled out of each (see Table 14). The DSM scales were not explored in these analyses, as the relation between these scales did not differ significantly from the relation between the pure item scales in the main analyses. The correlations between the Anxiety/Depressed and Aggression scales and between the Pure Anxiety and Pure Oppositional item scales for the self-report of the male youth were significant, whereas they were not significant for the females. It is possible that the correlations for the female sample were not significant due to the smaller sample size, and therefore it is important to look at the magnitude of the correlations. The magnitude of the correlation between the male Anxiety/Depressed and Aggression scales
was moderate, while the correlation between the male pure item scales was small (Cohen, 1988). However, the magnitudes of both of the correlations for the females were small, and appeared to be of similar size or slightly smaller than the correlation between the male pure items.

As was conducted in the main analyses, the magnitude of the difference between the correlation between the pure items and correlation between the syndrome scales was examined separately for males and females. The difference between the correlations for the males was significantly different, $Z_{bar}^* = 2.05, p = .02$ (large effect), and replicates the findings for the full sample. However, for females, the difference between the correlations was not significant, $Z_{bar}^* = .67, p = .25$ (medium but not significant effect). This lack of significant difference between the female correlations may be simply an issue of power as the magnitude of the difference between the correlations was moderate. This finding suggests that for youth rating their own symptoms, males appear to be more likely to have a significant degree of relatedness between anxiety and oppositional symptoms that can be accounted for by the ambiguous behaviors on the rating scales. Females, on the other hand, do not appear to have as great of a degree of relatedness between these behaviors as males, regardless of whether they are rating the complete scales that have both ambiguous and pure items, or only the pure item scales.

3.2.7 – Accounting for the Lower Reliability of the Pure Anxiety Item Scales.

In interpreting the pattern of stronger correlations between the scales containing both ambiguous and pure items, compared to the scores constructed from only the pure items, the possibility that the lower reliability of the pure anxiety item scales (which also had fewer items) might account for the lower correlation was considered. To investigate this
possibility, given that the pure anxiety scale had only four items, several four-item scales were created by randomly sampling items from the Anxiety/Depression scale on both the CBCL and the YSR. As the full Anxiety/Depression scale contains both pure and ambiguous items at a ratio of approximately 3 to 1, this same ratio was kept in the randomly selected sample of the four-item scales. The alphas for these reduced 4-item scales are shown in Table 15 and are indeed lower than the full scale's alpha, but are comparable to the alpha of the pure anxiety scale.

Pearson correlations were calculated between these four-item Anxiety/Depression scales and the CBCL and YSR Aggression scales, as well as the CBCL ODD scale, to see whether the corresponding relationships between the shortened form of the Anxiety/Depression scale and the Aggression scales, and the ODD DSM-oriented scales of the CBCL, were lowered due to the reduced number of items. For the CBCL, the shortened Anxiety/Depression scales had similar correlations to the Aggression and ODD DSM scales as those found between the full Anxiety/Depression scale and the Aggression scale and between the DSM Anxiety scale and ODD scale for this sample (see Table 15). These results suggest that, for the parent ratings, any decrease in the correlation between the pure scales is due to the removal of the ambiguous symptoms, and not simply due to the lowered alpha of the anxiety scale.

A similar procedure was followed for the YSR, and indicated that the correlations between the shortened Anxiety/Depression scale and the Aggression and ODD DSM scales, were again similar to the correlations for the full Anxiety/Depression scale and the Aggression scale for this sample (see Table 16). Therefore, it appears again that reduced reliability cannot fully account for decrease in the correlation between the pure item
scales compared to the correlation between the Anxiety/Depression scale and the Aggression scale, which contain both pure and ambiguous items.

3.2.8 – Parent and Youth Cross-Informant Agreement on Scale Scores. To examine the validity of the syndrome, DSM-oriented, and pure scales used in this study, cross-informant agreement was calculated between parents and youth for the anxiety and oppositional scales used in this study (see Table 17). The ratings of parents and youth were significantly correlated for all of the scales, although there was somewhat less agreement between the parent and youth ratings of the anxiety symptoms, which all showed small correlations, than between the parent and youth ratings of oppositional symptoms, which all showed moderate correlations. The results also show that the parent and youth ratings for the oppositional symptoms were similar in magnitude across the pure and other scales, suggesting that using only the pure items relating to oppositional behavior has little influence on the agreement between raters. However, the level of agreement between parents and youth appeared to decrease slightly as the scope of the anxiety scale became narrower, although the decrease from the correlation between anxiety syndrome scales and the anxiety pure scales was not statistically significant, Zbar2* = 1.23, p = .11 (large effect), possibly due to a lack of power.

3.3 – Discussion

In this second study, a clinical population was used to add ecological validity to the question of whether ambiguous/context specific behaviors increase the degree of overlap between ratings of anxiety and oppositional behaviors. Specifically, by using parent and youth ratings from only the pure anxiety and oppositional items of a commonly used child behavior rating scale (on which the commonly used scales contain
both the pure and ambiguous items), the degree of relatedness between the anxiety and oppositional behaviors was expected to decrease, as etiological theories suggest.

Before testing this hypothesis, several relationships were tested to determine and control for any effects they may have on the relationship between anxiety and oppositional symptoms. First, the SES of the family was found to be unrelated to the ratings of the parent or youth ratings. However, youth’s age was related to the parent-ratings of oppositional symptoms as measured by both Aggression scale and the ODD DSM-oriented scale, with older youths being rated as less oppositional than younger youth. This finding is consistent with what the literature would suggest (Lahey, Schwab-Stone, et al., 2000; Plewis, Vitaro, & Tremblay, 2006). As well, youth age was related to the endorsement of anxiety symptoms by the youth as measured by the Anxiety/Depression and Anxiety DSM scales on the YSR, with older adolescents reporting more anxiety symptoms. Again, this finding is commensurate with what the literature would suggest (Canadian Journal of Psychiatry, 2006). Partial correlations were used in the analyses to control for these age effects.

For the parent ratings, the correlation between the pure anxiety and pure oppositional items was found to be significantly smaller than both the correlations between the Anxiety/Depressed and Aggression Syndrome scales and the Anxiety and Oppositional Defiant DSM-oriented scales on the CBCL, which contained a mix of pure and ambiguous items. This supports the ambiguous behavior hypothesis, and suggests that ambiguous behavioral items may act to significantly increase the degree of overlap between parent reports of anxiety and oppositional behaviors. In contrast, the degree of relatedness between these two disorders decreases when the focus is kept more
specifically on the pure exemplars of the anxious or oppositional behavior in question, as is suggested by the etiological theories (Gray, 1994; Mason, et al., 2004; van Goozen, Snoek, Matthys, van Rossum, & van Engeland, 2004).

A similar result was found for the youth-rated items, in that the correlation between the youth-rated pure anxiety and pure oppositional items was significantly smaller than the correlation between the YSR Anxiety/Depression and Aggression empirical symptom scales, which contains a combination of pure and ambiguous items. However, the correlation between the youth-rated pure items was not significantly different than the correlation between the YSR DSM-oriented scales, which contain a slightly different combination and ratio of pure and ambiguous items. A possible explanation for the difference in findings between the empirical scales and the DSM-oriented scales is the scope of each of these scales. The empirically created syndrome scales contain a broader array of items. Conversely, the DSM-oriented scales were created with a theoretically driven focus, and therefore have a narrower scope and with fewer items. For example, the Anxiety/Depression scale has a ratio of pure to ambiguous items of about 1 to 3, whereas the ratio for the Anxiety DSM scale is approximately 1 to 2.

Another aspect that was considered was the effect of gender. Although there were no apparent gender effects on the parents' ratings, there were significant differences found between genders on the YSR Anxiety/Depression scale. Exploratory analyses were conducted to examine the difference between the correlation between the Anxiety/Depression scale and the Aggression scale, and between the pure scales for each gender. The findings show that degree of relatedness between the YSR syndrome scales
was much stronger for boys than it was for girls. This suggests that there may be some
differences in the way that males and females endorse items. It is possible that females,
who tend to experience greater degrees of internalizing problems than to do males
(Breton et al., 1999), are less likely than males to perceive items such as “crying” as
ambiguous, as they are more familiar with and perhaps have a greater understanding of
these behaviors. Thus, their degree of overlap is less on all versions of the scales. Males,
on the other hand, tend to display greater difficulties with externalizing problems, so are
perhaps more likely to have experience with overt behaviors, with perhaps less insight
into subtle differences in the underlying reasons for behaviors. The subsequent result may
be that, without further explanatory context, males are less able than females to
distinguish between ambiguous behaviors. Future studies would be useful in exploring
this difference.

The ratings of both the parent and the youth measures were found to have high
internal consistency for the CBCL and YSR empirical scales, and moderate to high for
the DSM-oriented scales. For the parent-rated pure oppositional items the internal
consistency was high, and the internal consistency for the youth-rated pure oppositional
items was moderate. However, the internal consistencies for both the parent and youth-
rated pure anxiety scales were low. To determine the effect these reduced internal
consistencies may have had on the results, several four-item scales were constructed
using random samplings of items from the Anxiety/Depression scale. It was found that,
despite the lower alphas of the shortened scales, their correlations with the Aggression
and ODD DSM scales remained consistent with what had been found between the
complete Anxiety/Depression and Anxiety DSM scales. This suggests that any decrease
in the correlation between the pure scales is due to the removal of the ambiguous symptoms, and not simply due to a decrease in the reliability of the scales.

Finally, in order to gain an assessment of the accuracy of these measurements, and whether using only the pure items may affect this, the cross-informant agreement between the parent and youth reports was obtained. Previous literature has found that parents and youth tend to agree most frequently regarding symptoms that are concrete, observable, severe, and unambiguous (Herjanic & Reich, 1997), and thus it is expected that the cross-informant agreement would be greatest between parents and youth for the oppositional symptoms. The results are in line with this expectation, showing moderate correlations between the parent and youth ratings of oppositional items, and small correlations between the parent and youth ratings of anxiety items. Impressively, there did not appear to be any decrease in the degree of relatedness between the informants when the pure oppositional item scale was used, compared to the full scales of the CBCL and YSR measures. This was not the case for the anxiety items, as there appeared to be a slight decrease in the degree of relatedness between the parent and youth ratings of pure anxiety items compared to the CBCL and YSR scales measuring anxiety. However, the decrease in the correlations was not significant and, while it may reflect that the pure items do not tap the anxiety construct as well as the combination of all the items, the discrepancy between the correlations may also reflect the lower reliability of the shorter scales compared to that of the full scales.

It is interesting to note, however, that the correlation between the YSR Anxiety/Depression and Aggression symptom scales was found to be marginally smaller than the correlation between the CBCL Anxiety/Depression and Aggression symptom
scales, $z = 1.34, p = .09$ (large effect), whereas the correlation between the pure items from the youth ratings was not significantly different from the correlation of pure items from the parent ratings, $z = -0.30, p = .62$ (small but not significant effect). This again is suggestive of the possibility that youth tend not to endorse the ambiguous behaviors to the same degree as the parents do, perhaps because for them the behaviors are not actually ambiguous. However, as this was not the primary focus of this study, future research could be useful in further elucidating whether the reduction of the ambiguity of internalizing difficulties affects the level of agreement between parents and youth, or whether other factors, such as severity and if the behaviours are observable, are more salient in this regard. However, these findings do highlight the importance of clinicians using a multi-source approach to assessment is frequently encouraged (Drabick, Gadow, & Loney, 2007; Plewis et al., 2006), and that a clinician or a researcher should not make the assumption that the report of the parent is necessarily more accurate than that of the youth.
Chapter IV – General Conclusion and Discussion

The purpose of this study was to test whether the degree of relatedness between SAD and ODD could be accounted for to some extent by methodological explanations. One strength of this research lies in the use of two separate studies: one a highly controlled analogue study, and second using a clinical population to determine whether the results observed in the analogue study actually occur in ratings of clinic-referred children. Both of these studies were used to test whether the use of some items, which can be considered ambiguous/context-lacking behavioral symptoms, could explain some of the overlap commonly observed between SAD and ODD. The results support the notion that, while SAD and ODD indeed appear to be positively associated, this positive relationship is to some extent accounted for by the tendency of parents, and to some extent youth, to endorse ambiguous or context-lacking symptoms of either disorder. When the focus is narrowed to include only behaviors that are considered to be pure exemplars of the disorders, the degree of overlap in ratings of the two disorders is significantly reduced.

4.1 – Influence of Ambiguous Items and Negative Halo Effects

While it is reassuring to note that mothers appear quite accurate in reporting behaviors that the child is presenting, mothers also endorsed symptoms of other disorders, even if these behaviors were not present in the child. In particular, in the first study it was found that mothers discriminated well between the pure exemplars of each behavior type, but showed less differentiation in their ratings of the ambiguous behaviors. This occurred regardless of which type of behavior was presented in the scenario. Therefore, it is possible that the degree of comorbidity between separation anxiety and
oppositional defiant behaviors may be explained, at least to some extent, by the frequency with which mothers endorse ambiguous or context-lacking behaviors representing the two disorders.

Additionally, in the first study in situations presenting an anxious child, mothers appeared to be influenced by a negative halo bias and were more likely to endorse other non-specific behavioral symptoms. On the other hand, when mothers were presented with a child described as displaying ODD behaviors, they rated only the ambiguous anxiety items as being likely to co-occur, and did not endorse the somatic items as co-occurring. Therefore, it is possible that both the negative halo hypothesis and the ambiguous behavior hypothesis may apply to the maternal ratings of anxiety behaviors, but that only the ambiguous behavior hypothesis applies to the maternal ratings of oppositional behaviors. This may be explained by the different attributions mothers make regarding children who are displaying anxious behaviors compared to those who are displaying oppositional behaviors. For example, previous studies have shown that mothers may view anxious children as more vulnerable and therefore likely to react negatively to a variety of experiences (Prinstein, Cheah, & Guyer, 2005), or may be more prone to a variety of problems, including somatic symptoms (Ginsburg, Riddle, & Davies, 2006). On the other hand, mothers may view children who are behaving in an oppositional and aggressive manner as being instigators (Crick & Dodge, 1994), and therefore more in control of themselves and less likely to be impacted by environmental events. They may, therefore, be less likely to report these children as experiencing other types of difficulties.

In further exploring the methodological contributions to the overlap between SAD and ODD, in Study 2 parent and youth reports were gathered from a clinical sample.
Using only the pure anxiety and oppositional items of a commonly used child behavior rating scale (on which the scales typically contain both the pure and ambiguous items), it was found that the degree of relatedness between these two disorders was significantly decreased. This was the case regardless of whether the empirically-derived or the theoretically-created scales were used from the CBCL. This picture was similar for the youth’s self-report ratings. The degree of relatedness between the pure scales was significantly reduced compared to the degree of relatedness between the empirically-derived scales.

This research, therefore, has provided evidence that the use of ambiguous or context-lacking items does contribute to an increase in the relationship between SAD and ODD, and that it is possible to narrow our focus onto only cleaner or more pure exemplars of the behaviors for these two disorders, resulting in a decrease of this relationship. This decreased relationship is more in line with what is expected based on the etiological theories of the disorders. Further, negative halo effects appear to influence maternal reports of children displaying anxiety behavior, but not children displaying oppositional behaviors. However, the degree of this relationship varied to some extent based on who reported the behaviors, whether parent or youth, and on the gender of the youth. These are interesting findings that need to be considered in order to clarify the relationship between SAD and ODD.

4.2 - Parent and Youth Ratings

An important pattern that should be considered is that for the parent ratings, the relationship between both the empirical scales and the theoretically-derived DSM scales, were both significantly larger than the relationship between the pure scales. This was not
the case for the youth, where only the relationship between the empirical scales was significantly larger than the relationship between the pure scales, but that the relationship between the DSM scales was not different that the relationship between the pure scales. This is not altogether unexpected, however, and the reasons for this are twofold. The first is that the two sets of scales from these measures represent two distinct methods for creating an assessment measure. As noted previously, the empirically created syndrome scales have more items, and contain a broader array of items than the more disorder-specific and narrower DSM-oriented scales. Therefore, it could be expected that the relation between the DSM-oriented scales should fall somewhere between the relationships between empirically-derived scales and the pure item scales, which is indeed what was found for both the parent and youth reports.

The second explanation for why there was a significant decrease at each stage of the narrowing focus of the scales for parents but not for youth, lies within the relationships between the youth-rated scales and the parent-rated scales. The relationship between the youth-rated empirically-based anxiety and oppositional scales was marginally smaller than the relationship the parent-rated empirically-based anxiety items and the oppositional scales, and indeed was similar in magnitude to the relationship between the parent-rated DSM-scales. Therefore, the degree of overlap between the ratings of anxiety and oppositional items in youth was already decreased to some extent. This suggests that youth may not endorse the ambiguous behaviors in the same way as the parents do to begin with, possibly because for them these behaviors are not really ambiguous or context-lacking. A possible explanation for this difference is that the youth possess the additional knowledge as to the underlying motivations for their own
behaviors, while parents do not, and this additional context makes a difference in how youth rate their own behaviors (Grills & Ollendick, 2002)

4.3 – Gender Issues

This research also revealed interesting gender differences in terms of how parents and youth endorse ambiguous and pure symptoms of SAD and ODD. The first study was designed with the males and females in the scenarios being presented in exactly the same manner, so no gender differences were expected, and indeed none were detected. However, ample literature has shown that males and females are frequently rated differently by parents and other caregivers and that this difference is potentially exacerbated depending on the setting in which the assessment is conducted (Waschbusch, King, & Northern Partners in Action for Children and Youth, 2006). For example, within community samples, females are more likely to be diagnosed with an internalizing disorder and males with an externalizing disorder (Breton et al., 1999; Foley et al., 2004). However, within clinic-referred samples and among adolescents, the nature of the gender presentation is different. Previous research has found that, although the prevalence of externalizing behaviors among adolescent males persists, female youth who are referred for residential care tend to display both externalizing and internalizing behaviors to a greater degree than those in community samples (Connor, Doerfler, Toscano, Volungis, & Steingard, 2004; Weis, Whitemarsh, & Wilson, 2005). Therefore, in the second study, which used a clinic referred sample, we would have expected few gender differences in the rates of the oppositional behaviors, and more differentiation for the anxiety behaviors with females displaying greater levels than males. This was the case for the oppositional behaviors, where both parents and youth reported no significant differences between
males and females in their endorsement of these behaviors. This likely reflects that the females referred to this provincial setting are displaying a more severe level of externalizing behaviors than would be found in a community sample. Therefore, future study may be useful in determining whether parents rate the pure and ambiguous oppositional items differently for males and females in community samples.

The ratings of the anxiety symptoms were somewhat different, with the ratings by the youth being consistent with previous literature in showing higher prevalence of anxiety in females on two of the three scales, while parents did not endorse any gender differences in the level of anxiety symptoms displayed by males and females. This finding, that the parents did not endorse any gender difference for the anxiety items is different that what was expected based on current literature (Foley et al., 2004), although it may reflect that parents have greater difficulty in detecting the occurrence of internalizing symptoms in both boys and girls, which has been suggested by previous literature (Herjanic & Reich, 1997). However, further study is recommended to determine whether some of this difficulty may also be related to the negative halo bias in the youth ratings of anxiety items. Female youth reported a significantly greater level of anxiety than the males on the empirical and DSM-oriented scales, but not on the pure anxiety items. It is not entirely clear why this is the case, although perhaps females tend to endorse more of the items that were judged in this study to be ambiguous.

However, it is important to note here that while the males showed a significant relationship between the anxiety and oppositional behaviors, the females did not. This may reflect that females, who tend to experience greater degrees of internalizing problems than to do males (Breton et al., 1999), are less likely than males to perceive
some items as ambiguous or context-lacking, as they may be able to understand any subtle distinctions underlying the behaviors. Males, on the other hand, tend to display greater difficulties with externalizing problems, so perhaps display less insight into subtle differences in the underlying reasons for behaviors. This is consistent with the developmental literature which has consistently found that emotional awareness (Bajgar, Ciarrochi, Lane, & Deane, 2005), which relates to the ability to recognize and categorize emotional stimuli, tends to be reported by females to a greater degree compared to males (Barrett, Lane, Sechrest, & Schwartz, 2000). With this in mind, males should display a greater degree of relatedness between the scales with pure and ambiguous symptoms than the females, and subsequently a greater decrease in relatedness when only the pure items were examined. This was indeed the result found in the exploratory analysis of the relationship between the oppositional and anxiety items for each gender, although further study is required as the female sample was quite small.

4.4 – Implications

This research, therefore, provided evidence that the use of ambiguous or context-lacking items contributes to an increase in degree of relatedness between SAD and ODD, and when the focus of the assessment measures is narrowed onto only the pure exemplars of the behaviors for these two disorders, the degree of relatedness decreases. While this is to some extent expected based on the etiological theories of the disorder, these etiological theories would have predicted no degree of positive association between the two disorders, or possibly a negative relationship. This was not, however, the case. In Study 2, there remained a small but significant correlation between the pure scales, which may reflect that these disorders are indeed related to some extent, and the further research is
needed to determine this extent, as well as to explore reasons for this in light of the etiological evidence to the contrary. It may be, for example, that individuals who are experiencing multiple disorders are in some way fundamentally different than those who are only experiencing one disorder (Jensen, 2003). Since the research supporting the etiological theories is based primarily on those experiencing only one disorder (Jensen, 2003), this research may not have detected this difference.

Despite the positive relationship that was observed between the anxiety and oppositional behaviors, it is important for clinicians and researchers to note that mothers were able to detect and differentiate between anxiety and oppositional symptoms in their children. This is an important point, as parents, and mothers in particular, are a valuable source of information regarding the presence of psychopathology in their children. However, these studies have also shown that, despite their ability to distinguish between the disorders in general, mothers, and possibly other caregivers as well, are prone to inappropriately endorsing ambiguous symptoms. This suggests that clinicians and researchers need to take this into consideration when conducting assessments or constructing measures, specifically that items which are non-specific may lead to an increase in overlap between disorders when no overlap actually exists. This may be accomplished by narrowing the focus onto the exemplar items of the disorders, or perhaps by providing additional context for the symptoms to clarify for parents under what circumstances the child might display a particular symptom. For example, this research has shown that pure item scales can be created that allow for a decrease in this overlap, as the etiological theories suggest, while maintaining a relatively comparable level of reliability and validity to the scales containing a mix of ambiguous and pure
items, especially for the oppositional symptoms. However, additional studies are needed to expand on this to determine whether it is possible to make the ambiguous items less ambiguous for parents, possibly by giving them additional context; by assessing the diagnostic utility of using only pure items and the validity for the overall construct of the disorder; and whether using only the pure items compared to using both ambiguous and pure items has predictive validity for future impairment.

As noted above, even with the removal of the ambiguous behaviors from the scales and the subsequent decrease in the degree of relatedness there appears to remain some level of overlap between the both the parent and youth ratings of anxiety and oppositional behaviors, which is consistent with previous epidemiological research (Angold et al., 1999; Ford et al., 2003; Marmorstein, 2007). Clearly then, there must be other possible explanations for the overlap between these disorders, including both methodological and substantive reasons. For example, since most measures used to assess child anxiety and oppositional behaviour do not differentiate the level of pervasiveness of the anxiety, they may pick up the more transient or mild anxiety that might be experienced by youth with externalizing behaviors, such as guilt or fear of punishment (Frick et al., 1999). It may also be that those individuals who have an underlying anxiety disorder may display reactive aggression, such as lashing out when they encounter an anxiety provoking situation, whereas those children and youth with oppositional defiant disorder display proactive aggression (Brendgen, Boivin, Dionne, Vitaro, & Pérusse, 2006). Perhaps a way of addressing this may be to determine the level of impairment resulting from the comorbid behaviors. Previous research has noted, for example, that very few behavioral rating scales include a measure of impairment, and that frequently
the child may display the behaviours captured by the rating scale while not being significantly impaired by them (Waschbusch & Elgar, 2007). Therefore, future studies are needed to explore the potential of other methodological and substantive explanations in describing the overlap between these disorders. Additionally, future epidemiological studies should consider these results in terms of clarifying the methods used in determining prevalence and comorbidity. It may be useful to have clinicians conduct or review epidemiological interviews in order to provide further context for the questions or to consider the role of context as a way to clarify the nature of the overlap between these disorders.

Finally, this research considered both SAD and ODD to be dimensional constructs, as suggested by current literature (Burns et al., 1997; Nigg, 2001; Norton, 2006; Sergeant et al., 2002). As such, the relationship between the anxious and oppositional behaviors was considered individually, rather than looking for the relationship between categories defined by diagnostic cutoff points. While this is a strength in some regards, as it allows for a closer examination of the pure and ambiguous behaviors making up the disorders, further study is required to determine the implication these findings have in terms of actual diagnosis. Future studies should therefore consider the utility of these behaviors in diagnostic assessment, and to what degree must an individual display the exemplar behaviors to warrant a diagnosis of SAD or ODD.

4.5 – Limitations

There are several limitations to this study that affected these studies. The age of children assessed in the first study was between 7 and 10 years, and was used as this is the most common age of onset for these disorders (APA, 2000; Lavigne et al., 2001).
Future studies should be conducted to determine whether the same pattern of findings would emerge with younger or older youth. The age range of the second study was limited to 12 to 17 years of age, as this is the age range of youth that are assessed at the provincially-funded centre. It is recommended that future research look at the parental ratings of younger children who are referred to clinics for these disorders, such as children hospitals. One difficulty here, however, is that child reports become increasingly difficult to reliably obtain with younger children (Sattler, 1992), so replicating the youth results with younger children may be difficult. Future research could be useful in determining the extent to which other adults and caregivers, such as fathers, step-parents, and foster-parents, also are affected by ambiguous and context-lacking item descriptions. This is important, as previous studies have shown a relationship between childhood psychological difficulties and disruption in the home that leads to non-parents being primary caregivers (Haddad & Garralda, 1992; Schachar & Wachsmuth, 1991).

The sample in both studies was primarily European-Canadian. However, literature has suggested that different cultures tend to view mental illness in different ways (Tseng, 2006). Therefore, it would be useful to determine whether the ratings of ambiguous and pure items completed by parents, or other caregivers, and of the youth themselves, are different depending on the cultural background of the responder. Likewise, socioeconomic status has shown a significant negative relationship with the presence and severity of psychopathology (Ford et al., 2003). While this study comprised participants from across the broad spectrum of socioeconomic statuses, looking for differences in how participants from different classes viewed ambiguous and pure items was not a prime focus. It may be useful to determine whether individuals with differing SES, particularly
differing levels of education, would be more or less likely to endorse ambiguous behavioral items.

4.6 – Conclusion

This study provided evidence for the effects of ambiguous/context-lacking items and negative halo bias in contributing to an increase in comorbidity between SAD and ODD. By narrowing our focus onto the pure exemplars of the behaviors for these two disorders, the degree of relatedness decreases. This is expected based on the etiological theories of the disorders, and yet the pure item scales retained adequate reliability and validity. Further study is required to determine whether the ambiguous items may be clarified for parents, whether the use of only pure items would maintain diagnostic utility or whether they are measuring a somewhat different construct of the disorder, and whether the pure items hold predictive validity for future psychopathology. Overall, however, these results can be used as a start in clarifying the relationship between anxiety and oppositional disorders, and as a signal for the need to do so.
Table 1.

Calculating a Sample Joint Odds Ratio

<table>
<thead>
<tr>
<th></th>
<th>Common Cold Absent</th>
<th>Common Cold Present</th>
</tr>
</thead>
<tbody>
<tr>
<td>Depression Absent</td>
<td>72</td>
<td>8</td>
</tr>
<tr>
<td>Depression Present</td>
<td>18</td>
<td>2</td>
</tr>
</tbody>
</table>
Table 2.

**Item Make Up of the Four Behavioral Categories**

<table>
<thead>
<tr>
<th>Pure Anxiety</th>
<th>Ambiguous Anxiety</th>
<th>Ambiguous Oppositional</th>
<th>Pure Oppositional</th>
<th>Somatic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clings to adults or too dependent</td>
<td>Nervous, high strung, or tense</td>
<td>Disobedient at school</td>
<td>Often blames others for his or her mistakes or misbehavior</td>
<td>Feels dizzy or lightheaded</td>
</tr>
<tr>
<td>Fears going to school</td>
<td>Worries</td>
<td>Talks about killing self</td>
<td>Destroys his/her own things</td>
<td>Constipated, doesn't move bowels</td>
</tr>
<tr>
<td>Too fearful or anxious</td>
<td>Feels worthless or inferior</td>
<td>Often loses temper</td>
<td>Destroys property belonging to others</td>
<td>Aches or pains (not stomach or headaches)</td>
</tr>
<tr>
<td>Feels afraid of being on his/her own at home</td>
<td>Feels he/she must be perfect</td>
<td>Suspicious</td>
<td>Often actively defies or refuses to comply with adults' requests or rules</td>
<td>Rashes or other skin problems</td>
</tr>
<tr>
<td>Worries about being away from parent</td>
<td>Cries a lot</td>
<td>Is often angry and resentful</td>
<td>Often deliberately annoys people</td>
<td>Problems with eye (not corrected by glasses)</td>
</tr>
<tr>
<td>Worries that something awful will happen to someone in our family</td>
<td>Fears he/she might think or do something bad</td>
<td>Screams a lot</td>
<td>Teases a lot</td>
<td>Sleeps more than most kids during day and/or night</td>
</tr>
<tr>
<td>Scared if he/she has to sleep on his/her own</td>
<td>Feels or complains that no one loves him/her</td>
<td>Argues a lot</td>
<td>Cruelty, bullying, or meanness to others</td>
<td>Gets hurt a lot, accident prone</td>
</tr>
<tr>
<td>Trouble going to school in the mornings because he/she feels nervous or afraid</td>
<td>Self-conscious or easily embarrassed</td>
<td>Demands a lot of attention</td>
<td>Is often spiteful and vindictive</td>
<td></td>
</tr>
<tr>
<td>Fears certain animals, situations, or places other than school</td>
<td></td>
<td></td>
<td>Is often touchy or easily annoyed by others</td>
<td>Physically attacks people</td>
</tr>
<tr>
<td>Scared if he/she had to stay away from home overnight</td>
<td></td>
<td></td>
<td>Sulks a lot</td>
<td>Disobedient at home</td>
</tr>
<tr>
<td>Temper tantrums or hot temper</td>
<td>Gets in many fights</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------------------------------</td>
<td>---------------------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Stubborn, sullen, or irritable</td>
<td>Threatens people</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Unusually loud</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Table 3.

**Internal Consistencies for Mothers’ Ratings of Items in the Behavior Categories in each Scenario Type**

<table>
<thead>
<tr>
<th>Scenario Type</th>
<th>Behavior Category</th>
<th>Internal Consistency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Separation Anxiety</td>
<td>Pure Anxiety</td>
<td>.95</td>
</tr>
<tr>
<td>Disorder</td>
<td>Ambiguous Anxiety</td>
<td>.91</td>
</tr>
<tr>
<td></td>
<td>Ambiguous Oppositional</td>
<td>.96</td>
</tr>
<tr>
<td></td>
<td>Pure Oppositional</td>
<td>.97</td>
</tr>
<tr>
<td></td>
<td>Somatic</td>
<td>.97</td>
</tr>
<tr>
<td>Oppositional Defiant</td>
<td>Pure Oppositional</td>
<td>.96</td>
</tr>
<tr>
<td>Disorder</td>
<td>Ambiguous Oppositional</td>
<td>.95</td>
</tr>
<tr>
<td></td>
<td>Ambiguous Anxiety</td>
<td>.95</td>
</tr>
<tr>
<td></td>
<td>Pure Anxiety</td>
<td>.98</td>
</tr>
<tr>
<td></td>
<td>Somatic</td>
<td>.97</td>
</tr>
</tbody>
</table>

*Note. N = 72.*
Table 4.

Descriptive Statistics for Study 1 Separation Anxiety Disorder Scenarios Behavior Category Ratings

<table>
<thead>
<tr>
<th>Scale</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pure Anxiety</td>
<td>4.01</td>
<td>0.70</td>
<td>1.75</td>
<td>4.97</td>
</tr>
<tr>
<td>Ambiguous Anxiety</td>
<td>3.86</td>
<td>0.63</td>
<td>1.97</td>
<td>4.97</td>
</tr>
<tr>
<td>Ambiguous Oppositional</td>
<td>1.80</td>
<td>0.84</td>
<td>0.10</td>
<td>3.77</td>
</tr>
<tr>
<td>Pure Oppositional</td>
<td>.97</td>
<td>.72</td>
<td>0.00</td>
<td>3.06</td>
</tr>
<tr>
<td>Somatic</td>
<td>1.74</td>
<td>1.11</td>
<td>0.04</td>
<td>3.96</td>
</tr>
</tbody>
</table>

Note. N = 72. Means for the behavioral categories of the scenarios were derived from ratings on a 6-point scale ranging from 0 to 5.
Table 5.

Descriptive Statistics for Study 1 Oppositional Defiant Disorder Scenarios Behavior

Category Ratings

<table>
<thead>
<tr>
<th>Scale</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pure Oppositional</td>
<td>3.83</td>
<td>.69</td>
<td>1.88</td>
<td>5.00</td>
</tr>
<tr>
<td>Ambiguous Oppositional</td>
<td>3.71</td>
<td>.66</td>
<td>1.52</td>
<td>4.85</td>
</tr>
<tr>
<td>Ambiguous Anxiety</td>
<td>2.20</td>
<td>.98</td>
<td>.19</td>
<td>4.28</td>
</tr>
<tr>
<td>Pure Anxiety</td>
<td>1.52</td>
<td>1.07</td>
<td>0.00</td>
<td>4.08</td>
</tr>
<tr>
<td>Somatic</td>
<td>1.40</td>
<td>1.07</td>
<td>0.00</td>
<td>3.50</td>
</tr>
</tbody>
</table>

*Note. N = 72. Means for the behavioral categories of the scenarios were derived from ratings on a 6-point scale ranging from 0 to 5.*
Table 6.

Descriptive Statistics for Study 1 Control Measures

<table>
<thead>
<tr>
<th>Measure</th>
<th>Scale</th>
<th>Mean</th>
<th>Standard Deviation</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>Brief Symptom Inventory</td>
<td>Anxiety</td>
<td>54.97</td>
<td>9.07</td>
<td>38.00</td>
<td>75.00</td>
</tr>
<tr>
<td></td>
<td>Hostility</td>
<td>56.96</td>
<td>9.14</td>
<td>39.00</td>
<td>74.00</td>
</tr>
<tr>
<td>Child Behavior Checklist</td>
<td>Anxiety/Depression</td>
<td>4.89</td>
<td>4.19</td>
<td>0.0</td>
<td>19.00</td>
</tr>
<tr>
<td></td>
<td>Aggression</td>
<td>6.71</td>
<td>5.62</td>
<td>0.0</td>
<td>21.00</td>
</tr>
</tbody>
</table>

*Note. N = 72. Means for the Brief Symptom Inventory are T-scores, means for the Child Behavior Checklist are raw scores.*
Table 7.

Correlations between the Behavioral Category Ratings for each Scenario Type and Child Age

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Behavioral Category</th>
<th>Child Age</th>
</tr>
</thead>
<tbody>
<tr>
<td>Separation Anxiety</td>
<td>Pure Anxiety</td>
<td>-.06</td>
</tr>
<tr>
<td>Disorder</td>
<td>Ambiguous Anxiety</td>
<td>-.06</td>
</tr>
<tr>
<td></td>
<td>Ambiguous Oppositional</td>
<td>-.15</td>
</tr>
<tr>
<td></td>
<td>Pure Oppositional</td>
<td>-.28*</td>
</tr>
<tr>
<td></td>
<td>Somatic</td>
<td>-.19</td>
</tr>
<tr>
<td>Oppositional Defiant</td>
<td>Pure Oppositional</td>
<td>-.12</td>
</tr>
<tr>
<td>Disorder</td>
<td>Ambiguous Oppositional</td>
<td>-.09</td>
</tr>
<tr>
<td></td>
<td>Ambiguous Anxiety</td>
<td>-.19</td>
</tr>
<tr>
<td></td>
<td>Pure Anxiety</td>
<td>-.21</td>
</tr>
<tr>
<td></td>
<td>Somatic</td>
<td>-.22</td>
</tr>
</tbody>
</table>

*Note. N = 72.

*p < .05
Table 8.
Correlations between the Ratings of the Behavioral Categories in each Scenario Type and the BSI

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Behavioral Category</th>
<th>Brief Symptom Inventory</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Anxiety</td>
</tr>
<tr>
<td>Separation Anxiety</td>
<td>Pure Anxiety</td>
<td>-.17</td>
</tr>
<tr>
<td>Disorder</td>
<td>Ambiguous Anxiety</td>
<td>-.20</td>
</tr>
<tr>
<td></td>
<td>Ambiguous Oppositional</td>
<td>.19</td>
</tr>
<tr>
<td></td>
<td>Pure Oppositional</td>
<td>.28*</td>
</tr>
<tr>
<td></td>
<td>Somatic</td>
<td>.15</td>
</tr>
<tr>
<td>Oppositional Defiant</td>
<td>Pure Oppositional</td>
<td>-.15</td>
</tr>
<tr>
<td>Disorder</td>
<td>Ambiguous Oppositional</td>
<td>-.16</td>
</tr>
<tr>
<td></td>
<td>Ambiguous Anxiety</td>
<td>.19</td>
</tr>
<tr>
<td></td>
<td>Pure Anxiety</td>
<td>.24*</td>
</tr>
<tr>
<td></td>
<td>Somatic</td>
<td>.26*</td>
</tr>
</tbody>
</table>

*Note. N = 72.

* p < .05.
Table 9.

**Correlations between the Ratings of the Behavioral Categories in each Scenario Type and the Child Behavior Checklist**

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Behavioral Category</th>
<th>Anxiety</th>
<th>Aggression</th>
</tr>
</thead>
<tbody>
<tr>
<td>Separation Anxiety</td>
<td>Pure Anxiety</td>
<td>.21</td>
<td>.06</td>
</tr>
<tr>
<td>Disorder</td>
<td>Ambiguous Anxiety</td>
<td>.18</td>
<td>.13</td>
</tr>
<tr>
<td></td>
<td>Ambiguous Oppositional</td>
<td>.07</td>
<td>.05</td>
</tr>
<tr>
<td></td>
<td>Pure Oppositional</td>
<td>.00</td>
<td>.03</td>
</tr>
<tr>
<td></td>
<td>Somatic</td>
<td>.19</td>
<td>.06</td>
</tr>
<tr>
<td>Oppositional Defiant Disorder</td>
<td>Pure Oppositional</td>
<td>.13</td>
<td>-.06</td>
</tr>
<tr>
<td></td>
<td>Ambiguous Oppositional</td>
<td>.17</td>
<td>-.04</td>
</tr>
<tr>
<td></td>
<td>Ambiguous Anxiety</td>
<td>.19</td>
<td>-.01</td>
</tr>
<tr>
<td></td>
<td>Pure Anxiety</td>
<td>.15</td>
<td>.02</td>
</tr>
<tr>
<td></td>
<td>Somatic</td>
<td>.20</td>
<td>-.04</td>
</tr>
</tbody>
</table>

*Note. N = 72.*

*ps > .05.*
Table 10.

Internal Consistencies for the Pure Item Scales

<table>
<thead>
<tr>
<th>Measure</th>
<th>Scale</th>
<th>Internal Consistency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Parent Rated Pure Items</td>
<td>Anxiety</td>
<td>.64</td>
</tr>
<tr>
<td></td>
<td>Oppositional</td>
<td>.80</td>
</tr>
<tr>
<td>Youth Rated Pure Items</td>
<td>Anxiety</td>
<td>.63</td>
</tr>
<tr>
<td></td>
<td>Oppositional</td>
<td>.76</td>
</tr>
</tbody>
</table>

*Note. N = 201 for the parent rated scales, N = 177 for the youth rated scales.*
Table 11.
Descriptive Statistics for Study 2

<table>
<thead>
<tr>
<th>Measure</th>
<th>Scale</th>
<th>Mean</th>
<th>Deviation</th>
<th>Minimum</th>
<th>Maximum</th>
</tr>
</thead>
<tbody>
<tr>
<td>CBCL</td>
<td>Anx/Dep</td>
<td>9.12</td>
<td>5.08</td>
<td>0</td>
<td>22</td>
</tr>
<tr>
<td></td>
<td>Aggression</td>
<td>17.75</td>
<td>8.15</td>
<td>1</td>
<td>35</td>
</tr>
<tr>
<td></td>
<td>Anxiety DSM</td>
<td>4.68</td>
<td>2.96</td>
<td>0</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>OD DSM</td>
<td>6.82</td>
<td>2.67</td>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Pure Anxiety</td>
<td>2.54</td>
<td>2.14</td>
<td>0</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Pure OD</td>
<td>6.84</td>
<td>3.85</td>
<td>0</td>
<td>16</td>
</tr>
<tr>
<td>YSR</td>
<td>Anx/Dep</td>
<td>7.07</td>
<td>5.18</td>
<td>0</td>
<td>23</td>
</tr>
<tr>
<td></td>
<td>Aggression</td>
<td>12.93</td>
<td>6.31</td>
<td>0</td>
<td>28</td>
</tr>
<tr>
<td></td>
<td>Anxiety DSM</td>
<td>3.60</td>
<td>2.83</td>
<td>0</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>OD DSM</td>
<td>5.35</td>
<td>2.45</td>
<td>0</td>
<td>10</td>
</tr>
<tr>
<td></td>
<td>Pure Anxiety</td>
<td>2.10</td>
<td>1.84</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Pure OD</td>
<td>5.06</td>
<td>3.28</td>
<td>0</td>
<td>15</td>
</tr>
</tbody>
</table>

Table 12.

Correlations for the Child Behavior Checklist Scales and for the Scores Created by the Pure Items

<table>
<thead>
<tr>
<th>Scale</th>
<th>Correlated with</th>
<th>Correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anxiety/Depression</td>
<td>Aggression</td>
<td>.43**</td>
</tr>
<tr>
<td>Anxiety DSM-Oriented</td>
<td>Oppositional Defiant DSM-Oriented</td>
<td>.33**</td>
</tr>
<tr>
<td>Pure Anxiety</td>
<td>Pure Oppositional</td>
<td>.17*</td>
</tr>
</tbody>
</table>

*Note. N = 201. Age was partialled from all correlations.

*p < .05. **p < .01.
Table 13.

Correlations for the Youth Self-Report Scales and for the Scores Created by the Pure Items

<table>
<thead>
<tr>
<th>Scale</th>
<th>Correlated with</th>
<th>Correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anxiety/Depression</td>
<td>Aggression</td>
<td>.31**</td>
</tr>
<tr>
<td>Anxiety DSM-Oriented</td>
<td>Oppositional Defiant DSM-Oriented</td>
<td>.22**</td>
</tr>
<tr>
<td>Pure Anxiety</td>
<td>Pure Oppositional</td>
<td>.20**</td>
</tr>
</tbody>
</table>

*Note. N = 177. Age was partialled from all correlations.*

**p < .01.
Table 14.

Correlations for the Youth Self-Report Scales and for the Scores Created by the Pure Items Separated by Gender

<table>
<thead>
<tr>
<th>Gender</th>
<th>Scale</th>
<th>Correlated with</th>
<th>Correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Male</td>
<td>Anxiety/Depression</td>
<td>Aggression</td>
<td>.37**</td>
</tr>
<tr>
<td></td>
<td>Pure Anxiety</td>
<td>Pure Oppositional</td>
<td>.23*</td>
</tr>
<tr>
<td>Female</td>
<td>Anxiety/Depression</td>
<td>Aggression</td>
<td>.22</td>
</tr>
<tr>
<td></td>
<td>Pure Anxiety</td>
<td>Pure Oppositional</td>
<td>.16</td>
</tr>
</tbody>
</table>

*Note. N = 117 for the male sample, N = 60 for the female sample. Age was partialled from all correlations.

*p < .05. **p < .01.
Table 15.

Internal Consistencies and Correlations with the Child Behavior Checklist

Aggression and ODD Scales for Scales Constructed with Random Samples of Four Items from the CBCL Anxiety/Depression Scale

<table>
<thead>
<tr>
<th>Sample</th>
<th>Alpha</th>
<th>Correlation with CBCL Aggression Scale</th>
<th>Correlation with CBCL ODD – DSM Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.51</td>
<td>.35**</td>
<td>.25**</td>
</tr>
<tr>
<td>2</td>
<td>.56</td>
<td>.38**</td>
<td>.36**</td>
</tr>
<tr>
<td>3</td>
<td>.58</td>
<td>.41**</td>
<td>.35**</td>
</tr>
<tr>
<td>4</td>
<td>.48</td>
<td>.47**</td>
<td>.37**</td>
</tr>
<tr>
<td>5</td>
<td>.62</td>
<td>.38**</td>
<td>.33**</td>
</tr>
</tbody>
</table>

Note. N = 201. Child Behavior Checklist (CBCL), Samples of items contained three ambiguous items and one pure item in order to maintain the same ratio found in the full Anxiety/Depression scale.

**p < .01.
Table 16.

Internal Consistencies and Correlations with the Youth Self-Report Aggression and ODD Scales for Scales Constructed with Random Samples of Four Items from the YSR Anxiety/Depression Scale

<table>
<thead>
<tr>
<th>Sample</th>
<th>Alpha</th>
<th>Correlation with YSR Aggression Scale</th>
<th>Correlation with YSR ODD – DSM Scale</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.57</td>
<td>.32**</td>
<td>.20**</td>
</tr>
<tr>
<td>2</td>
<td>.51</td>
<td>.29**</td>
<td>.22**</td>
</tr>
<tr>
<td>3</td>
<td>.55</td>
<td>.27**</td>
<td>.17*</td>
</tr>
<tr>
<td>4</td>
<td>.55</td>
<td>.26**</td>
<td>.17*</td>
</tr>
<tr>
<td>5</td>
<td>.61</td>
<td>.29**</td>
<td>.22**</td>
</tr>
</tbody>
</table>

Note. N = 177. Youth Self Report (YSR), Samples of items contained three ambiguous items and one pure item in order to maintain the same ratio found in the full Anxiety/Depression scale.

*p < .05. **p < .01.
Table 17.

Parent and Youth Cross-Informant Agreement on Scale Scores

<table>
<thead>
<tr>
<th>Scale</th>
<th>Correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anxiety/Depression Scales</td>
<td>.28**</td>
</tr>
<tr>
<td>Anxiety DSM Scales</td>
<td>.23**</td>
</tr>
<tr>
<td>Pure Anxiety Item Scales</td>
<td>.20**</td>
</tr>
<tr>
<td>Aggression Scales</td>
<td>.38**</td>
</tr>
<tr>
<td>Oppositional DSM Scales</td>
<td>.40**</td>
</tr>
<tr>
<td>Pure Oppositional Scales</td>
<td>.38**</td>
</tr>
</tbody>
</table>

*Note. N = 159. Age was partialled from all correlations.*

**p < .01.
Bibliography


Appendix I – Scenario Examples

The following case describes a child with some behavior problems. Following this scenario you will be asked about how likely the child is to have other behavior problems. Please read the following case description carefully, as you will not be able to return to this page once you proceed to the questions.

<table>
<thead>
<tr>
<th>Last Name: XXX</th>
<th>Case Number: DAB – 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Name: Alex</td>
<td>Parents: Monica 35, lab technician, and Joel, 37, plumber.</td>
</tr>
<tr>
<td>Age: 8 years, 7 months</td>
<td>Siblings: Brandon, 5, and Josie, 2</td>
</tr>
<tr>
<td>School Attending: Montroyal Elementary</td>
<td>Family History: Parents divorced 2 years ago; father moved out and set up residence with his new girlfriend; the children are still finding their father’s new relationship and living arrangements difficult to accept. The children see their father only on holidays and special occasions.</td>
</tr>
<tr>
<td>Child Interests: Loves animals and has two hamsters, enjoys reading comics.</td>
<td>Presenting Problem: Alex’s mother stated that Alex is afraid to go to school. Mrs. X noted that Alex is easily embarrassed in lots of situations and tends to blush red and get all sweaty. For example, when called upon to answer a question in class he froze and couldn’t do it. She said Alex seems to worry about all kinds of things all the time. She noted that he often tends to break down and cry. She said that when she tries to talk to him about some of these problems, Alex becomes upset and starts to cry. She also said that he frequently complains that he feels no one loves him, saying that his parents never want to do anything with him. She reported that Alex has difficulties going to a friend’s house to play. In fact, she said he has never been able to sleep away from home over night. Alex also has real trouble getting ready for school in the morning because he feels nervous. For example, Mrs. X. described how this made her late one morning because he was fretting over not being able to find his favorite “lucky” pencil. Alex’s mother also reported that he is afraid if he is left on his own at home, even for short periods of time. She recalled that he became quite distraught over her having to go pick up his sibling from the day care, which would have only taken 20 minutes or so.</td>
</tr>
</tbody>
</table>
The following case describes a child with some behavior problems. Following this scenario you will be asked about how likely the child is to have other behavior problems. Please read the following case description carefully, as you will not be able to return to this page once you proceed to the questions.

<table>
<thead>
<tr>
<th>Last Name: XXVV</th>
<th>Case Number: DOB – 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Name: Kyle</td>
<td>Parents: Julie, 32, chemical engineer, and Spencer, 33, high school teacher.</td>
</tr>
<tr>
<td>Age: 9 years, 6 months</td>
<td>Siblings: Terry, 2 years</td>
</tr>
<tr>
<td>School Attending: Source Elementary</td>
<td>Family History: Parents divorced shortly after the birth of Terry, 2 years ago, father sees the children at least three days a week. Parents describe the relationship as collaborative and civil.</td>
</tr>
</tbody>
</table>
| Child Interests: Skiing, playing with friends, soccer | Presenting Problem: 

Kyle's mother reported that Kyle often refuses to do as he is told, for example cleaning his room or taking the dog for a walk. Mrs. X described Kyle is often irritable. She said Kyle will often go to his room and pout for hours when he doesn't get his way. He is frequently very loud while playing and his mother said, "I always know Kyle's in the house." It was reported that several times Kyle has physically lashed out by hitting and punching people. Mrs. X. reported that this has included both of his parents and his babysitter. Kyle's mother stated that Kyle is often disobedient in his classroom. For example, he refuses to stop writing his quizzes when the time is up. She also noted that Kyle has been sent home several times for bullying other students. She described how Kyle is always suspicious, and lately has been spending a lot of time wondering what the other kids are up to.

Click here to proceed to the scenario questions
The following case describes a child with some behavior problems. Following this scenario you will be asked about how likely the child is to have other behavior problems. Please read the following case description carefully, as you will not be able to return to this page once you proceed to the questions.

<table>
<thead>
<tr>
<th>Last Name: XXX</th>
<th>Case Number: DAG – 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Name: Amber</td>
<td>Parents: Monica 35, lab technician, and Joel, 37, plumber.</td>
</tr>
<tr>
<td>Age: 8 years, 7 months</td>
<td>Siblings: Brandon, 5, and Josie, 2</td>
</tr>
<tr>
<td>School Attending: Montroyal Elementary</td>
<td>Family History: Parents divorced 2 years ago; father moved out and set up residence with his new girlfriend; the children are still finding their father’s new relationship and living arrangements difficult to accept. The children see their father only on holidays and special occasions.</td>
</tr>
<tr>
<td>Child Interests: Loves animals and has two hamsters, enjoys reading comics.</td>
<td></td>
</tr>
</tbody>
</table>

**Presenting Problem:**

Amber’s mother stated that Amber is afraid to go to school. Mrs. X noted that Amber is easily embarrassed in lots of situations and tends to blush red and get all sweaty. For example, when called upon to answer a question in class Amber froze and couldn’t do it. Mrs. X said Amber seems to worry about all kinds of things all the time. She noted that Amber often tends to break down and cry. The mother said that when she tries to talk to Amber about some of these problems, Amber becomes upset and starts to cry. She also said that Amber frequently complains that she feels no one loves her, saying that her parents never want to do anything with her. Mrs. X reported that Amber has difficulties going to a friend’s house to play. In fact, she said Amber has never been able to sleep away from home over night. Amber also has real trouble getting ready for school in the morning because Amber feels nervous. For example, Mrs. X described how this made her late one morning because Amber was fretting over not being able to find her favourite “lucky” pencil. Amber’s mother also reported that Amber is afraid if she is left on her own at home, even for short periods of time. She recalled that Amber became quite distraught over her mother having to go pick up her sibling from the daycare, which would have only taken 20 minutes or so.

Click here to proceed to the scenario questions.
The following case describes a child with some behavior problems. Following this scenario you will be asked about how likely the child is to have other behavior problems. Please read the following case description carefully, as you will not be able to return to this page once you proceed to the questions.

**Last Name:** XXVV  **Case Number:** DOG – 7

**First Name:** Katie  **Parents:** Julie, 32, chemical engineer, and Spencer, 33, high school teacher.

**Age:** 9 years, 6 months  **Siblings:**

**School Attending:** Source Elementary  **Terry, 2 years**

**Child Interests:** Skiing, playing with friends, soccer  **Family History:**

*Parents divorced shortly after the birth of Terry, 2 years ago, father sees the children at least three days a week. Parents describe the relationship as collaborative and civil.*

**Presenting Problem:**

Katie’s mother reported that Katie often refuses to do as she is told, for example cleaning her room or taking the dog for a walk. Mrs. X described Katie is often irritable. She said Katie will often go to her room and pout for hours when she doesn't get her way. Katie is frequently very loud while playing and her mother said, “I always know Katie’s in the house.” It was reported that several times Katie has physically lashed out by hitting and punching people. Mrs. X. reported that this has included both of Katie’s parents and Katie’s babysitter. Katie’s mother stated that Katie is often disobedient in her classroom. For example, Katie refuses to stop writing her quizzes when the time is up. She also noted that Katie has been sent home several times for bullying other students. She described how Katie is always suspicious, and lately has been spending a lot of time wondering what the other kids are up to.
Appendix II – UBC Research Ethics Board Certificates of Approval