

UCLA

UCLA Electronic Theses and Dissertations

Title

Dual Diagnosis: Intellectual Disability and Oppositional Defiant Disorder

Permalink

<https://escholarship.org/uc/item/2mr74206>

Author

Christensen, Lisa Louise

Publication Date

2012

Peer reviewed|Thesis/dissertation

UNIVERSITY OF CALIFORNIA

Los Angeles

Dual Diagnosis:

Intellectual Disability and Oppositional Defiant Disorder

A dissertation submitted in partial satisfaction of the
requirements for the degree Doctor of Philosophy
in Psychology

By

Lisa Louise Christensen

2012

@Copyright by

Lisa Louise Christensen

2012

ABSTRACT OF THE DISSERTATION

Dual Diagnosis:
Intellectual Disability and Oppositional Defiant Disorder

By

Lisa Louise Christensen

Doctor of Philosophy in Psychology

University of California, Los Angeles, 2012

Professor Bruce L. Baker, Chair

Children with intellectual disabilities (ID) represent an underserved minority in the public health domain. Yet this population demonstrates an elevated rate of comorbid mental health disorders and disruptive behavior disorders in particular. Given the elevated rates of behavior problems seen in children with ID, however, the validity and significance of a disruptive behavior diagnosis for this population remains unknown. In this light, the current study examines the dual diagnosis of Oppositional Defiant Disorder (ODD), one of the most common disruptive behavior disorders, in children and adolescents with intellectual disabilities over a 10-year time period. The study examines the clinical presentation, etiology and outcomes associated with ODD for children with and without ID to determine whether this is the same disorder for both populations. Findings suggest that children with ID and those with borderline intellectual functioning demonstrate higher rates of ODD and a higher comorbidity with other disruptive behaviors disorders such as Attention-Deficit Hyperactivity Disorder. However, the disorder otherwise appears the same for children with and without ID, and the stability, age of onset, symptom presentation, etiology and outcomes (on measures of later behavior problems,

friendships and risk-taking) do not differ for children with ODD with and without ID. Accordingly, the results of the current study suggest that ODD is the same disorder for children with and without ID and that the same interventions may be useful for both populations.

The dissertation of Lisa Louise Christensen is approved.

Steve S. Lee

Steven Reise

Joan Asarnow

Bruce L. Baker, Committee Chair

University of California, Los Angeles

2012

Table of Contents

I.	Biography/Vita	
II.	Chapter 1: Introduction	1
III.	Chapter 2: Overview	8
IV.	Chapter 3: Methods	12
	Participants	12
	Measures	13
V.	Chapter 4: Clinical Presentation of ODD	18
VI.	Chapter 5: Etiological Model	38
VII.	Chapter 6: Relationship between ODD and Behavior Problems	62
VIII.	Chapter 7: Friendships in Pre-adolescence	81
IX.	Chapter 8: Delinquent and Risk Taking Behaviors	104
X.	Chapter 9: Conclusions	120
XI.	References	123

LISA LOUISE CHRISTENSEN, M.A., C.PHIL.

EDUCATION

- 2008 UNIVERSITY OF CALIFORNIA, LOS ANGELES
Master of Arts in Clinical Psychology
Master Thesis Title: Play and Developmental Outcomes in Infant Siblings of Children with Autism
- 2006 UNIVERSITY OF CALIFORNIA, SAN DIEGO
Bachelor of Arts in Human Development, Highest Distinction, Magna Cum Laude, Phi Beta Kappa
Honors Thesis: Language Learning in Regressive and Non-regressive Autistic Children (Highest Distinction)

PUBLICATIONS

- 2012 Tipton, L.A., **Christensen, L.** & Blacher, J. (accepted). Friendship Quality in Adolescents with and without an Intellectual Disability. *Journal of Applied Research in Intellectual Disabilities*.
- 2012 **Christensen, L.**, & Baker, B. (in press). Oppositional Defiant Disorder in Children with Developmental Delays: Prevalence, Age of Onset and Stability. *Journal of Mental Health Research in Intellectual Disability*
- 2012 **Christensen, L.**, Fraynt, B., Neece, C. L. & Baker, B.L. (2012). Bullying Adolescents with Intellectual Disability. *Journal of Mental Health Research in Intellectual Disability*. 5(1), 49-65.
- 2011 Blacher, J. & **Christensen, L.** (2011). Sowing the Seeds of the Autism Field: Leo Kanner (1943). *Intellectual and Developmental Disabilities*. 49(3), 172-91.
- 2010 **Christensen, L.**, Rozga, A., Hutman, T., Young, G., Ozonoff, S., Rogers, S., Baker B., and Sigman, M. (2010). Play and Developmental Outcomes in Infant Siblings of Children with Autism. *Journal of Autism and Developmental Disorders*. 40(8), 946-957.

HONORS AND AWARDS

- 2011 Shepherd Ivory Franz Distinguished Teaching Award
2010 Psychology Department Dissertation Year Fellowship
2010 Collegium of Undergraduate Teaching Fellows
2008 UCLA Graduate Research Mentorship Fellowship
2008 National Science Foundation Honorable Mention

2007	Faculty Women's Club Fellowship
2007	UCLA Graduate Summer Research Fellowship
2006	Faculty Women's Club Fellowship
2006	UCLA University Fellowship
2006	Magna Cum Laude
2006	Highest Distinction in Human Development
2005	Caledonian Honor Society
2005	UCSD Undergraduate Research Award
2005	Phi Beta Kappa Honor Society
2001-06	Provost's Honors
2001	Golden Key National Honor Society
2002	National Collegiate Scholar
2003	UC Regents Scholarship
2001	National Spanish Honor Society
2001	AP Scholar with Honors
2001	National Merit Commendation

TEACHING EXPERIENCE

2010-2011	<p>UCLA Collegium of Teaching Fellows Teaching Fellow Duties: Teaching a seminar I designed entitled <i>Developmental Disabilities: Syndromes, Etiology and Treatment</i>, including giving lectures, providing writing instruction and feedback to undergraduate students and participating in a course on teaching pedagogy. Advisor(s): Bruce Baker, Ph.D., CUTF Staff and Administration</p>
2009-2011	<p>UCLA Fernald Intern Class Co-instructor/Guest Lecturer Duties: Aiding in the instruction of a course on child psychopathology and clinical research methods through guest lectures on disruptive behavior disorders, autism spectrum disorders, etc. Instructor: Bruce Baker, Ph.D.</p>
2009	<p>UCR Department of Education Guest Lecturer Duties: Lecture to graduate course on screening and diagnostic assessments for autism spectrum disorders and ongoing research on early indicators of autism. Instructor: Jan Blacher, Ph.D.</p>
2008-2011	<p>UCLA Fieldwork in Psychology Class Guest Lecturer Duties: Lecture to undergraduate students on autism spectrum disorders – etiology, assessment, treatment, etc. Instructor: Heather Taylor, M</p>

Chapter 1: Introduction

Children with intellectual disabilities and their families represent an underserved minority in the public health domain. This is particularly significant given the additional stressors that parents of children with intellectual disabilities experience throughout their child's life. Parents of children with intellectual disabilities experience considerably more parenting stress than parents of typically developing children (Dyson, 1997; Lustig, 1999; McIntyre, Blacher & Baker, 2002). Moreover, children with intellectual disabilities are at increased risk for comorbid mental health disorders, and dual diagnosis (the diagnosis of two or more comorbid mental health disorders, APA 2000) occurs in 30% to greater than 50% of cases (Cormack, Brown & Hastings, 2000; Emerson, 2003; Linna, et al., 1999; Molteno, Molteno, Finchelescu & Dawes, 2001). Even in the absence of diagnosable disorders, children with intellectual disabilities engage in a significantly higher number of challenging behaviors than their typically developing peers (Baker, Blacher, Crnic & Edelbrock, 2002; Einfeld & Tonge, 1996; Whitaker & Read, 2006), and these behavior problems appear to be a mediating factor in the elevated level of stress their parents experience (Baker et al, 2003).

In the context of the heightened number of behavior problems seen in children with intellectual disabilities, the diagnosis of comorbid disruptive behavior disorders is a controversial topic, and it is often unclear whether behavior problems are manifestations of the child's disability or a comorbid mental health disorder (Borthwick-Duffy, 1994). Oppositional defiant disorder (ODD) is one of the most common disruptive behavior disorders (Lahey, Miller, Gordon & Riley, 1999), yet it remains unknown whether ODD is a valid diagnosis for a child with an intellectual disability. Moreover, the significance of a diagnosis of ODD in children with intellectual disabilities remains unclear, and it is possible that having ODD has no incremental impact beyond the behavioral problems that accompany the intellectual disability. In this light, the primary aim of the current study is to examine the validity and significance of an ODD diagnosis for children with intellectual disabilities.

Developmental Disabilities and Delays

The Center for Disease Control and Prevention (CDC) defines developmental disabilities as a group of chronic and often severe conditions involving mental and/or physical impairments that begin prior to 22 years of age and last throughout the person's lifetime (www.cdc.gov). Developmental disabilities can include disorders such as autism spectrum disorders, intellectual disabilities, and cerebral palsy.

The Diagnostic and Statistical Manual of Mental Disorders – Fourth Edition-TR (DSM-IV-TR, American Psychiatric Association [APA], 2000), defines intellectual disability (ID; labeled mental retardation in the DSM-IV-TR) as intellectual functioning that is well below the average range and that results in significant limitations in the person's daily living skills. The DSM-IV-TR recognizes four categories of intellectual disability based on intelligence quotient (IQ) scores -- mild ID (IQ 50–70), moderate ID (IQ 35–55), severe ID (IQ 20–40), and profound ID (IQ less than 20–25). In each category, the intellectual delays must be accompanied by impairments in adaptive behavior and must occur before the age of 18. The DSM also includes a diagnostic classification of borderline intellectual functioning for individuals with IQs just above the cut-off for intellectual disability (IQ range of 71-84).

Developmental delay is a broader term used to describe a significant lag in cognitive, linguistic, or physical functioning. For the purpose of the current study, developmental delay will be defined as cognitive functioning well below average (IQ scores below 85), often with concomitant impairments in adaptive functioning. Moreover, for the current study, the term developmental delay will be used in reference to a combined group of children with ID and those with borderline intellectual functioning.

Risk for Dual Diagnosis

The current study defines dual diagnosis in the context of intellectual disability and thus, this term signifies the presence of one or more mental health diagnoses in addition to the intellectual disability. Traditionally, the mental health of individuals with intellectual

disabilities has been ignored in spite of the greater risk for comorbid psychiatric disorders. Although the issue of dual diagnosis among individuals with ID was first noted in the mid-nineteenth century and later described in 1908 by Tredgold, psychiatric comorbidity in persons with intellectual disabilities was largely overlooked until the last few decades (Reiss, Levitan, & Szyszko, 1982).

Studies of children and adolescents with ID have showed elevated rates of psychiatric diagnoses with comorbidity estimates from 30% to greater than 50% (Cormack, Brown and Hastings, 2000; Dekker & Koot, 2003; Einfeld, Ellis and Emerson, 2011; Einfeld & Tonge, 1996; Emerson & Hatton, 2007; Emerson & Einfeld, 2010; Rojahn & Meier, 2009). Yet most research on the prevalence of psychiatric disorders in youth with intellectual disabilities has focused on psychiatric disorders in general and some studies have presented the prevalence rates for categories of disordered behavior that do not correspond to the specific disorders listed in the Diagnostic and Statistical Manual of Mental Disorders – 4th Edition-TR (DSM-IV-TR; APA, 2000) or International Classification of Disorders – 10th Edition (ICD-10; WHO, 1993).

Likewise, much of this research has utilized a checklist approach to diagnosis in which youth above a certain cut-off point on measures such as the Developmental Behavior Checklist (DBC) are considered cases, while those below that cut-off are considered non-cases (Cormack et al. 2000; Dekker et al. 2003; Einfeld & Tonge, 1996; Molteno, et al., 2001). While beneficial in advancing research on comorbid psychopathology in general, these studies do not provide information on specific co-morbid psychiatric disorders. Finally, many of these studies have failed to include a comparison group of typically developing children.

Recent epidemiological research utilizing standard diagnostic instruments has supported previous findings and suggests that children and adolescents with intellectual disabilities experience elevated rates of many psychiatric disorders (Emerson & Einfeld, 2010; Emerson & Hatton, 2007). Nevertheless, few studies have examined the epidemiology of specific psychiatric disorders in detail giving information beyond prevalence and comorbidity.

The diagnosis of mental disorders in children with ID is complicated because children with ID (and particularly those with moderate, severe, and profound ID) may have significant difficulties verbally expressing their internal experience. As a result, clinicians and researchers must rely on parents' and other observers' reports of the child's behavior to assess, and at times infer, psychopathology. Accordingly, modifications to standard diagnostic criteria and a diagnostic manual for individuals with ID have been developed to aid clinicians and researchers in understanding the presentation of comorbid disorders in this population (Diagnostic Manual – Intellectual Disability (DM-ID), American Association for Intellectual and Developmental Disabilities (AAIDD); Fletcher, et al., 2007). However, modifying the standard diagnostic criteria for children and adolescents with ID both complicates our ability to determine the prevalence of disorders and brings up a key question: Are these the same mental disorders in children with intellectual disabilities as they are in children with typical cognitive functioning? It may be that psychiatric disorders in children with ID are the same with regard to their genetic, neuroanatomical, and experiential etiology and that cognitive deficits simply mask this similarity. Yet it is also possible that psychiatric disorders in children with ID only partially map onto the disorders described in children with typical cognitive development and that the nature of disorders in these two populations is distinctly different.

Disruptive Behavior Disorders and Intellectual Disability

When categories of psychiatric disturbance are considered, disruptive behavior disorders (Attention Deficit/ Hyperactivity Disorder; Oppositional Defiant Disorder, Conduct Disorder) are particularly elevated in youth with ID, with 20- 25% meeting criteria for a disruptive behavior disorder (Dekker & Koot, 2003; Emerson & Hatton, 2007). In contrast, prevalence rates for disruptive behavior disorders in children with typical development on these same measures have been approximately 4% (Emerson, 2003; Emerson & Hatton, 2007). The comorbidity between ID and behavior disorders is an especially complicated issue because of the high prevalence of behavior problems in ID (Baker, Blacher, Crnic & Edelbrock, 2002; Whitaker

and Read, 2006). As a result, it may be difficult to determine the true prevalence of comorbid behavior disorders. The DSM-IV-TR states that individuals with intellectual disabilities should not be given a behavior disorder diagnosis unless the behavior problems are above and beyond what is expected for this population (APA, 2000). This raises two problems. On one hand, there may be considerable diagnostic overshadowing in which clinicians and researchers view all behavior problems as manifestations of the intellectual disability rather than an additional behavior disorder (Reiss, Levitan, & Szyszko, 1982). On the other hand, clinicians and researchers may fail to recognize the higher prevalence of behavior problems in individuals with ID and consequently, view all behavior problems as stemming from a comorbid mental disorder. Moreover, it may be that diagnosable behavior disorders simply represent the extreme end of the behavior problems continuum. A comorbid behavior disorder diagnosis could simply signify a certain frequency and intensity of behavior problems.

Oppositional Defiant Disorder and Intellectual Disability

Oppositional Defiant Disorder (ODD) is one of the most common behavior disorders in children; prevalence estimates in the typically developing population range from 1% to 20%, with a median of 3% (Lahey, Miller, Gordon & Riley, 1999). As defined in the DSM-IV-TR (APA, 2000), ODD is characterized by a pattern of negativistic, hostile, and defiant behavior. Symptoms of ODD include arguing with adults, defying rules, deliberately annoying others, blaming others for one's mistakes, frequently losing one's temper, and being easily annoyed, frequently angry or resentful, and spiteful or vindictive. To receive a diagnosis of ODD, children must exhibit four of these symptoms for a period of at least 6 months with significant impairment in social, academic, and occupational functioning.

Research suggests that children and adolescents with intellectual disabilities have an elevated rate of ODD, with one study citing a prevalence rate of 13.3% (Emerson, 2003). Likewise, research on risk factors contributing to the development of ODD and other conduct problems finds significant associations with cognitive functioning such that children with lower

cognitive abilities have higher rates of conduct problems later on (Elkins, Iacono, & Doyle, 1997; Fergusson, Horwood, & Riddler, 2005; Ge, Donnellan, & Wenk, 2001; Kratzer & Hodgins, 1999; Lynam, Moffitt, & Stouthamer-Loeber, 1993; Moffitt & Silva, 1988). Interestingly, this does not appear to be an artifact of socioeconomic status (Lynam, et al., 1993; Moffitt & Silva, 1988). Children and adolescents with conduct problems show deficits in IQ scores ranging from half a standard deviation to one standard deviation below average (Lynam & Henry, 2001). In particular, research suggests that slower language development and lower verbal intelligence may increase the risk for conduct problems by negatively impacting typical social development through poorer communication between the child and his or her caretakers (Keenan & Shaw, 1997). Accordingly, children and adolescents with developmental delays may be at particular risk for ODD based on their intellectual functioning.

Although a diagnosis of ODD reflects a cross-situational and pervasive level of hostility, ODD does have some overlap with common childhood behavior problems (e.g. talking back, refusing to comply with requests, etc.) and thus, it may be difficult to distinguish true cases of comorbid ODD from other behavior problems in children with ID. Accordingly, research is needed to address whether having a comorbid diagnosis of ODD has meaning for children with intellectual disabilities. In other words, it remains unknown whether children with intellectual disabilities and ODD experience additional or qualitatively different types of behavior problems than children with intellectual disabilities without ODD. Alternatively, children with intellectual disabilities and comorbid ODD may experience a higher frequency of the same behaviors as children with ID without ODD and thus, ODD may simply represent the extreme end of a behavior problems continuum for children with intellectual disabilities.

Borderline Intellectual Functioning

Relatively less research has focused on the issues of dual diagnosis in children with borderline intellectual functioning. However, there is evidence to indicate that like children with ID, children with borderline intellectual functioning are at greater risk for social and

occupational difficulties in adulthood (Vaillant & Davis, 2000), and children with borderline intellectual functioning experience rates of behavior problems that are similar to children with ID (Fenning, Baker, Baker & Crnic, 2007). More importantly, children with borderline intellectual functioning are at particular risk for negative outcomes because their parents may not recognize their cognitive limitations and adapt their expectations accordingly. Fenning et al., (2007) found that mothers of children with borderline intellectual functioning were less positive and sensitive than either mothers of children with developmental delays and mothers of typically developing children. However, those mothers of children with borderline intellectual functioning that recognized their child's cognitive limitations appeared more similar to mothers of children with developmental delays in terms of positivity and sensitivity. Thus, it appears that children with borderline intellectual functioning represent a unique risk group, experiencing higher levels of psychopathology than typically developing children within less adaptive contexts than children with ID.

Chapter 2: Overview

The primary goal of this dissertation was to examine the validity and significance of Oppositional Defiant Disorder as a psychiatric diagnosis for children and adolescents with intellectual disabilities. Diagnostic validity has historically been determined through clinical description, laboratory findings, exclusion of other disorders, follow-up studies, and family history (Robins & Guze, 1970). More recently, researchers have also emphasized the importance of examining etiological factors, developmental course, outcomes, and treatment response (Andreasen, 1995; Antshel et al., 2006). When examining whether a diagnosis is valid for a particular population, it is important to consider the convergence of these elements in the typical population and the population of interest – whether the presentation and etiology of the disorder is the same for both groups. Likewise, it is important to consider sources of divergence and illustrate that the disorder in the population of interest diverges in clinical description and etiology from other disorders or characteristics in this population.

This dissertation examined the convergence between ODD in children with and without intellectual disabilities for some of the factors needed to establish diagnostic validity – clinical description, etiology, and outcomes. Likewise, this study examined the divergent validity between ODD and other behavior problems for children with ID. This dissertation is one of the first to examine this question and did so through a number of specific aims, each of which is presented as a separate chapter.

The first aim of this dissertation was to elucidate the clinical presentation of ODD in children with and without ID (Chapter 4). The second aim was to explore etiological models of ODD to determine whether the pathways to this disorder described in the literature on typically developing children hold true for children with ID (Chapter 5). The third aim was to examine the relationship between ODD and other behavior problems with over time, thus investigating the predictive validity of ODD for children with and without ID (Chapter 6). The fourth and fifth aims of the dissertation examined outcomes of interest in pre-adolescence – friendships

(Chapter 7) and risk-taking/delinquent behaviors (Chapter 8) – to determine further the predictive validity of an ODD diagnosis for children with and without ID.

Rationale & Significance

The significance of this study must be considered in light of the impact that dual diagnoses have on children with intellectual disabilities and their families. Parents of children with ID experience considerably more parenting stress than parents of typically developing children (Baker et al., 2002; Dyson, 1997; Estes et al., 2009; Hodapp, Ricci, Ly & Fidler, 2003; Lustig, 1999). Likewise, parents of children with ID experience higher rates of mental health problems and depressive symptoms (Emerson, 2003b; Herring et al., 2006; Olsson & Huang, 2001), and have poorer physical health (Eisenhower, Baker & Blacher, 2009) than parents of typically developing children.

Research suggests that many of the negative outcomes for parents of children with intellectual disabilities are attributable to the heightened level of behavior problems in this population (Baker et al., 2002; Baker et al, 2003; Hodapp, et al., 1998; Stores, Stores, Fellows & Buckley, 1998). Given that having any comorbid psychiatric disorder coincides with a heightened number of behavior problems for children with intellectual disabilities (Borthwick-Duffy, 1994; Felce, Kerr & Hastings, 2009; Holden & Gitlesen, 2003; Moss, et al., 2000; Rojhan, Matson, Naglieri & Mayville, 2004), parents of dually diagnosed children may experience particularly high levels of parenting stress, depressive symptoms and negative physical effects (Emerson, 1995; Faust & Scior, 2008; Maes, Broekman, Dosen & Nauts, 2003).

Moreover, dually diagnosed individuals are less likely to live with family and are more frequently placed into congregate care settings than individuals with intellectual disability without a comorbid psychiatric disorder (Allen, 1989; Lakin, Doljanic, Taub, Chiri & Byun, 2007). Emerson (1995) notes that individuals with intellectual disabilities and comorbid mental health disorders are at risk for abuse and are likely to experience high levels of seclusion and restraint. Given the incremental risks and negative impact posed by these conditions,

additional research is needed to characterize further the nature of comorbid mental health disorders in individuals with intellectual disabilities. This study adds to the literature on dual diagnosis by examining one of the most common disorders (i.e. Oppositional Defiant Disorder) seen in children and adolescents with ID and its presentation, etiology and impact on the well-being of this population.

It is particularly important for researchers and clinicians to distinguish comorbid ODD from other behavior problems in part because ODD (if a meaningful comorbid diagnosis) may relate to a variety of other mental health problems, including Attention-Deficit/Hyperactivity Disorder and Conduct Disorder (CD). Research on typically developing children suggests that 90% of youths meeting criteria for CD met ODD criteria previously (Lahey, et al., 1994; Loeber, Keenan, Lahey & Green, 1993). Many youth who meet criteria for ODD do not develop CD later on (Lahey, Loeber, Southamer-Loeber & Christ, 1990). However, the presence of ODD appears to increase the risk for more severe conduct problems later on, and children with ODD who never progress to CD may also experience negative outcomes. Likewise, behavior problems associated with ODD may have a greater impact on family functioning and parenting behaviors than non-ODD-related behavior problems and may worsen family relationships over time, leading to other negative mental health outcomes for both the individual with ID and his/her caretakers and family members. Finally, interventions for behavior problems in individuals with a dual diagnosis of ID and ODD may differ from interventions targeting more common and/or non-pathological behavior problems in individuals with ID.

Organization

Chapter 3 will discuss the overall methods for this dissertation. In the subsequent chapters, each aim of the study will be addressed separately with relevant background information, a brief overview of the participants and measures used, presentation of the analyses, and a discussion of the results. The final chapter (Chapter 9) includes a larger

discussion, bringing together the results of each of the five aims and addressing the primary question – whether or not ODD is the same disorder for children with and without ID.

Chapter 3: Methods

Participants

Participants were selected from 238 families recruited to participate in a longitudinal study (“The Collaborative Family Study”) conducted at the University of California, Los Angeles, University of California, Riverside, and Pennsylvania State University. Families of typically developing children as well as families of children with developmental delays residing in the Southern California and Central Pennsylvania areas were recruited through community agencies serving persons with developmental disabilities, and the corresponding local preschools and daycare centers. Selection criteria for enrollment for typically developing (TD) children included (a) an enrollment age between 30 and 39 months, (b) a score of 85 or above on the Bayley Scales of Infant Development – II (BSID II; Bayley, 1969) at the intake assessment, and (c) no history of prematurity or diagnosis of a developmental disability. Criteria for children with developmental delays (DD) included (a) an enrollment age between 30 and 39 months, (b) a score between 30 and 84 on the BSID II, (c) being ambulatory and (d) not diagnosed with autism. A total of 238 families enrolled in the study at child age 3 and an additional 19 families (all with developmental delays) were recruited at child age five. At age 13, another sample of 25 participants was recruited (17 TD; 8 ID).

Participants and their families completed a battery of questionnaires & lab tasks at child ages 3, 4, 5, 6, 7, 8, 9 and 13. Additional questionnaires and home visits were conducted at child age 3.5, 4.5, and 12.

As is expected in longitudinal research, there has been some attrition over time. Approximately 171 subjects have data from ages 3-9. There is a slightly larger sample of 189 participants with data from ages 6-9 due to the addition of 19 participants at age 5. Only 101 participants have data from age 3 to 13. Given the changes in sample size over time, the sample for each aim of the study is described separately in the relevant chapters.

Inclusion criteria for the ID group was an IQ of 70 or below on the Stanford-Binet IV (or Wechsler Intelligence Scale for Children IV; WISC IV) and scores of 85 or below on the Vineland Scales of Adaptive Behavior II. Participants were considered to have borderline intellectual functioning (Borderline) if they scored between 71 and 84 on the Stanford-Binet IV (or WISC IV) and had scores on the Vineland below 85. Finally, inclusion criteria for the typically developing group was an IQ on the Stanford-Binet IV (or WISC IV) above 85. Of note, for some aims, the Borderline and ID groups will be combined and referred to as developmentally delayed (DD) to increase sample sizes.

Measures

Stanford-Binet IV (SB-IV; (Thorndike, Hagen, & Sattler, 1986)). The SB-IV is a widely used instrument designed to test the cognitive abilities of individuals 2 to 23 years in age. The SB-IV is comprised of 15 subtests and yields a composite IQ score with a normative mean of 100 and a standard deviation of 15. The SB-IV has good internal consistency and test-retest reliability (Thorndike, et al., 1986). It is well suited to the evaluation of children with delays because starting points for the subtests can be adapted to meet the child's developmental level. The composite score of the SB-IV was used as a measure of overall cognitive abilities at child age 5.

Wechsler Intelligence Scale for Children, Fourth Edition (WISC-IV; Wechsler, 2003): Scores from the Vocabulary, Matrix Reasoning, and Arithmetic subtests of the WISC-IV were used to determine an estimated IQ range and confirm status group classification at child ages 9 and 13. The selection of these three subtests was based on the high correlation between IQ estimates from these subtests and IQ scores based on the full battery of subtests (Sattler & Dumont, 2004).

Vineland Scales of Adaptive Behavior-II (VABS; Sparrow, Cicchetti, & Balla, 2005). The VABS is a semi-structured interview conducted with a parent or other caregiver that assesses the child's adaptive behavior in a variety of domains. Scores from the communication, daily living

skills and socialization subscales comprise the Adaptive Behavior Composite. This measure was shown to have good reliability (alphas in the low 80s for most subscales) and good validity for children (Sparrow, Cicchetti, & Balla, 2005). The VABS was administered at ages 5, 9, and 13 and the composite score was used to group participants into the ID, Borderline, and TD groups.

Toddler Behavior Assessment Questionnaire (Abbreviated; TBAQ-A; Goldsmith, 1996).

The TBAQ-A is a caregiver-report questionnaire of toddler behavior that includes five subscales addressing activity level, pleasure, social fearfulness, anger proneness and interest/persistence. The TBAQ-A has high internal consistency within the subscales with alphas ranging from .78 to .83 (Goldsmith, 1996). Likewise, there is good evidence for convergent validity with other measures of temperament. The TBAQ-A was administered to parents at child age 3 as a measure of child temperament.

Symptom Checklist-35 (SCL-35; Derogatis 1993). The SCL-35 is a widely used measure of psychiatric symptomatology. Higher scores on the SCL-35 reflect more psychological symptoms. Adequate reliability for this measure (Cronbach's alpha = 0.84) has been previously reported (Cicirelli 2000). The SCL-35 total score at age 3 was used as a measure of maternal psychopathology.

Parent-Child Interaction Rating System (PCIRS; Belsky, Woodworth, & Crnic, 1996).

The Parent-Child Interaction Rating System (PCIRS; Belsky, Woodworth, & Crnic, 1996) is a coding system for parent and child behaviors and interactions that can be applied to a variety of observational tasks. The PCIRS includes ratings of maternal behavior and child behavior as well as dyadic ratings of mother-child interactions. Each variable is coded on a 5-point scale, ranging from 1 (not all characteristic) to 5 (highly characteristic). Maternal codes include positivity, negativity, intrusiveness, sensitivity, stimulation of cognition and detachment. Child codes include positivity, negativity, liveliness/activity, sociability, sustained attention and demandingness. Dyadic codes include dyadic pleasure and dyadic conflict between mother and child. Fenning, et al., (2007) created two composite scores based on codes from the PCIRS –

positive parenting (positivity + sensitivity + stimulation of cognition – detachment) and *negative/controlling parenting* (intrusiveness + negative affect). The PCIRS negative/controlling parenting index was used at age 5 as a measure of parenting behaviors.

Diagnostic Interview Schedule for Children (DISC; Costello, Edelbrock, & Costello, 1985). The DISC is a highly structured diagnostic interview administered to the parent that covers DSM-IV-TR criteria for all of the major mental illnesses observed in children and adolescents. Respondents are asked about the presence or absence of symptoms within the diagnostic categories, and disorder-specific algorithms are used to derive diagnoses from responses to individual items. The DISC has undergone extensive testing, refinement and revision (Fisher, Shaffer, Piacentini & Lapkin, 1993; Shaffer, Schwab-Stone, Fisher & Cohen, 1993; Schwab-Stone, Fisher, Piacentini & Shaffer, 1993) and has achieved acceptable levels of reliability and validity (Jensen, Roper, Fisher & Piacentini, 1995). The DISC was administered at ages 5, 6, 7, 8, 9, 12 and 13 as a measure of child psychopathology. Standard administration was followed, except that mothers were given a brief description of each area (e.g. anxiety, fear, behavior problems) and asked to select the areas that were relevant to their child (with a minimum of one area). This procedure reduces administration time, increases reliability, and is judged to be more engaging for the respondents than the standard procedure of administering all areas in a fixed order (Edelbrock, Crnic & Bohnert, 1999). For the 13-year assessment, however, all participants were administered the ADHD and ODD sections of the DISC regardless of whether they endorsed these areas as being relevant for their child.

Child Behavior Checklist for Ages 1 ½ - 5 (CBCL; Achenbach & Rescorla, 2000). This preschool version of the CBCL has 99 items that indicate child problems, listed in alphabetical order (from “aches and pains without medical cause” to “worries”). The respondent indicates, for each item, whether it is “not true” (0), “somewhat or sometimes true” (1), or “very true or often true” (2), now or within the past two months. The CBCL yields a total problem score, broadband externalizing and internalizing scores, 7 narrow-band syndrome scores and 5 DSM-

oriented scores. This version of the CBCL was administered to both parents at child ages 3-5 as a measure of behavior problems.

Child Behavior Checklist for Ages 6-18 (CBCL; Achenbach & Rescorla, 2001). This child/adolescent version of the CBCL has 20 competence items in which the parent rates his/her child's activities, social relationships and school performance and 118 items that describe specific behavioral and emotional problems. The respondent indicates, for each item, whether it is "not true" (0), "somewhat or sometimes true" (1), or "very true or often true" (2), now or within the past six months. The CBCL yields a total problem score, broadband externalizing and internalizing scores, 8 narrowband syndrome scores and 6 DSM-oriented scores. The CBCL yields three competence scores (Activities, Social and School) and a total competence scale score. This version of the CBCL was administered to both parents at child ages 6-13 as a measure of behavior problems.

Semi-Structured Parent Interview. The semi-structured parent interview was conducted at child age 13. During the (average) 45-min interview, parents (usually mothers) were asked to describe any significant life events that had occurred in the family and how these had impacted the adolescent, the adolescent's friendships and relationships with his or her peers, and the adolescent's experiences (if any) of being bullied or bullying others. The interview also asked about any concerning behaviors or involvement with negative peer groups; relationship with his or her sibling(s) (if applicable); and school involvement, performance, and attitudes. Clinical psychology graduate students administered the interviews. They were trained in the administration of semi-structured interviews and received ongoing feedback on their administration to ensure fidelity across interviewers. A detailed coding system had been developed based on the administration of the Parent Interview at youth age 12, and a coding team worked together for over a year and achieved high reliability. Reliability checks were conducted on one third of all total coded videos, and teams of coders were required to meet at least 70% reliability with the master coder.

Semi-Structured Adolescent Interview. The semi-structured adolescent interview was conducted at child age 13; it was developed to parallel the Parent Interview in content. Adolescents were asked to describe their friendships and relationships with peers, their relationship with their sibling(s) (if applicable), their involvement in school, opinions of school, and whether they had experienced or engaged in any bullying. As with the Parent Interview, trained graduate students administered the Adolescent Interview. Similarly, a coding system was developed for each of the domains addressed in the interview, and the same standards for reliability were used.

Adolescent Risk-Taking and Delinquency Questionnaire. This questionnaire was created for the current study and included 33 items about the adolescents' participation in a range of risky and delinquent behaviors. Items were based on questions from the Self-Report Delinquency Questionnaire (SRD; Elliot, & Huizinga, 1983), the Adolescent Risk-Taking Questionnaire (Gullone, Moore, Moss & Boyd, 2000) and other unpublished risk-taking and delinquency measures (Kaplan & Robbins, 1983; Leung & Lau, 1989). Given the younger age of the sample in the current study, included items address a variety of delinquent and risky behaviors that range in severity from "I have passed notes, instant messaged or texted friends while in class" to "I have used other drugs (cocaine, heroin, LSD, K, opium, etc.)." A number of follow-up items were included that address whether respondents felt pressure from peers to engage in reported behaviors. The questionnaire was converted into an online survey using SurveyMonkey.com to reduce discomfort and encourage honest responses. The questionnaire was administered at child age 13 as a measure of participation in risky or delinquent activities.

Chapter 4: Clinical Presentation of Oppositional Defiant Disorder in Children with and without Intellectual Disabilities¹

The first aim of this dissertation was to describe the clinical presentation of ODD in children with developmental delays and determine whether this presentation differs from ODD in typically developing children. In order to achieve this aim, we compared the prevalence, age of onset, gender differences, comorbidity, and stability of ODD in children with intellectual disabilities, borderline intellectual functioning, and typically development, and evaluated group differences in ODD symptomology as measured by a parent-report instrument.

Prevalence

Oppositional Defiant Disorder is one of the most common referral reasons for youth mental health services (Loeber, Burke, Lahey, Winters & Zera, 2000) with prevalence rates of 2-15% in the typically developing population (Lahey, et al., 1999; Loeber et al., 2000; Maughan, Rowe, Messer, Goodman & Meltzer, 2004). Using data from the National Comorbidity Survey Replication, Nock, Kazdin, Hiripi & Kessler (2007) found evidence for a 10.2% lifetime prevalence of ODD.

Youth with intellectual disabilities have an elevated prevalence of ODD; Emerson & Hatton (2007) reported rates of 13.3 and 11.1% compared to 2.3% in typically developing youth. However, much of the research on the prevalence of ODD and other disruptive behavior disorders in children with intellectual disabilities focuses on a particular age or on a large age range. The present study expands on this sampling by examining prevalence rates for children with intellectual disabilities, children with borderline intellectual functioning and typically developing children at five points across middle childhood and analyzing the changes in the odds ratios of meeting ODD criteria over time.

¹ Note: This aim of the dissertation is currently in press at the *Journal of Mental Health Research in Intellectual Disabilities*. Minor modifications have been made to that paper to fit the format of this dissertation.

Age of Onset

Research on ODD in typically developing youth suggests that the median age of onset is 12 or 13 years of age (Kessler et al., 2005; Nock, 2007) although there is evidence for diagnoses as early as 2-5 years of age (Lavigne et al., 2001). Moreover, the DSM-IV-TR cites the age of onset as usually evident prior to age 8 and typically not later than early adolescence.

No studies to date have examined the age of onset of ODD in children with developmental delays and it remains unknown whether children with ID and those with borderline intellectual functioning experience earlier or later onsets than typically developing children.

Gender

Some studies illustrate a higher prevalence of ODD in boys (Carlson, Tamm & Gaub, 1997; McDermott, 1996; Rey, 1993). However, other studies do not show such gender differences (Lahey et al., 2000; Lumley, McNeil, Herschell, & Bahl, 2002). Reflecting this inconsistency, two studies found that gender differences varied by reporter, with significant gender differences in the prevalence of ODD for teacher report only (Maughan et al., 2004; Serra-Pinheiro, Mattos & Regala, 2008). Similarly, the DSM-IV reports gender differences in ODD prior to pubertal onset, with more boys than girls meeting criteria for the disorder, but indicates no gender difference in prevalence rates during adolescence (APA, 2000).

At present, the gender distribution of ODD in children with ID and those with borderline intellectual functioning remains unknown.

Comorbidity

Epidemiological research suggests that psychiatric disorders frequently co-occur and that approximately 79% of individuals who meet criteria for one disorder also meet criteria for another (Kessler, Nelson, McGonagle & Liu, 1996). Much of the research on the comorbidity of ODD focuses on ODD as a comorbid condition for children and adolescents with Attention-Deficit Hyperactivity Disorder (ADHD). Results from the MTA Study (Jensen, et al., 2001)

suggest that 39.9% of children with ADHD also meet criteria for ODD. Likewise, in one of the few studies that focuses on the clinical presentation of ODD, Speltz, McClellan, DeKlyen & Jones (1999) found that 39% of clinic-referred boys with ODD also met criteria for ADHD.

Research suggests that approximately 14 to 19% of children with intellectual disabilities are diagnosed with multiple psychiatric disorders (Dekker & Koot, 2003; Emerson, 2003) compared to 3% of typically developing children. Likewise, recent findings suggest higher rates of comorbidity with ODD for children with ADHD and ID. Five-year-old children with ID showed comorbidity rates of 53% while children with TD had a comorbidity rate of 21% (Baker, Neece, Fenning, Crnic & Blacher, 2010).

Stability

Research suggests that behavior problems are relatively stable across time for children with developmental delays (Baker et al., 2003) and typically developing children (Campbell, March, Pierce & Ewing, 1991; Campbell, Pierce, March & Ewing, 1994a, Campbell, 1994; Campbell & Ewing, 1990; Egeland, Kalkoske, Gottesman & Erickson, 1990; Lavigne et al., 1998; McGee, Partridge, Williams & Silva, 1991). Moreover, research on ODD in typically developing children indicates that symptoms are relatively stable over time, with 57% continuing to meet criteria for ODD two years after their initial intake (Speltz et al., 1999). Likewise, the Developmental Trends Study (Lahey & Loeber, 1994) examined the diagnostic changes of clinic-referred children and found that 47% of the boys with ODD continued to meet criteria 4 years later (excluding those children who developed conduct disorder). To our knowledge, there is no research to date examining the stability of ODD for children with ID.

Symptom Presentation

Much of the research on the specific symptoms of ODD has focused on the validity of this diagnosis as separate from conduct disorder (CD), and such studies have presented factor analytic models of ODD and CD. Likewise, investigators have examined cut-off scores for ODD in typically developing children, finding that many children with only 3 of the 4 necessary

symptoms for a DSM-IV diagnosis are as impaired as children meeting full criteria (Angold & Costello, 1996). Considerably less research has examined the relative frequency of symptoms endorsed. However, Speltz et al. (1999) examined the specific symptoms of ODD endorsed by 92 mothers of clinic-referred boys between 4-6 years of age. Of the DSM-III-R symptoms on the Diagnostic Interview Schedule for Children (DISC; Costello et al., 1985), 84-94% of the sample met criteria for the following symptoms of ODD: loses temper, argues with adults, defies/refuses to comply and annoys others. Approximately 50% of the sample (39-54%) met criteria for the blames others, touchy or easily annoyed, angry/resentful, and spiteful/vindictive symptoms. Only 18% of the sample met criteria for the DSM-III-R symptom of swearing. Thus, it appears that there are differences in the frequencies with which mothers of children with ODD endorse certain items.

Investigators have yet to consider the presentation of ODD in children with developmental delays with regard to the number of symptoms or specific items endorsed. In this light, the current study examined the symptom presentation and number of symptoms endorsed by mothers on a semi-structured diagnostic interview, comparing children with and without developmental delays.

Hypotheses & Rationale for the Current Study

The primary aim of the present study was to assess the prevalence, gender differences, age of onset, comorbidity, diagnostic stability, and symptom pattern of ODD in children with ID, borderline intellectual functioning, or typical development across early and middle childhood (ages 5-9 years). The primary question asked was: Is the clinical presentation of ODD the same for children with cognitive delays as those with typical cognitive development? If the clinical picture of ODD is similar for children with intellectual disability, borderline intellectual functioning, and typical cognitive development, the position that ODD is the same disorder for these populations would be supported. If there are significant differences in the clinical picture

of ODD among children in these three groups, then the position that ODD means something different in children with cognitive delays would be supported.

Question 1: What is the clinical presentation of Oppositional Defiant Disorder in children with intellectual disabilities and how does it differ from typically developing children?

Hypotheses:

- 1a. *Children with intellectual disabilities will have an elevated rate of oppositional defiant disorder compared to typically developing peers.*
 - 1a-1. *Children with borderline intellectual functioning will have elevated rates of oppositional defiant disorder similar to the rates found in children with ID.*
- 1b. *Patterns of comorbidity will be similar for children with ODD with and without intellectual disabilities. In particular, rates of comorbid ADHD will be significantly elevated among both children with ODD and ID and those with ODD alone.*
- 1b. *Diagnoses of ODD will be moderately stable over middle childhood for children with and without ID.*
 - 1b-1. *The stability of diagnoses of ODD will not differ between children with ID and typically developing children.*

Although it is expected that the odds of receiving a diagnosis of ODD will be higher in children with developmental delays than typically developing children, no hypotheses were specified with regard to changes in the odds ratio over time.

No hypotheses were specified with regard to group differences in the age of onset of ODD, the number of symptoms of ODD endorsed, or the frequency of endorsement for specific symptoms of ODD.

With the exception of the prevalence rate, no hypotheses were specified with regard to clinical presentation of ODD in children with borderline intellectual functioning.

Brief Method:

Participants

The data reported in this aim of the study are from the 184 of the original 238 families who met inclusion criteria, i.e. those who completed the age 5 assessment and at least 2 of the 4 assessments between child ages 6 and 9. The families in the current sample did not differ from the 53 families who did not meet inclusion criteria on any of the demographic variables shown in Table 1.1.

The children were classified based on scores on the SB-IV and VABS at child age 5, the first year considered in the present study. Although the children were followed through age 13, only data from ages 5-9 was used for the current analyses.

Table 1.1 shows demographic characteristics at child age 5 by developmental status group (TD, Borderline and ID). Child gender and race/ethnicity were not associated with status group; 57% of the participants were male and the 60% were Caucasian. Family income and mothers' education were significantly related to group status. The TD group had more families with an annual income of \$50,000 or higher than the ID and borderline groups, and mothers in the TD group completed significantly more years of school than mothers in the ID group. As these socioeconomic variables did not relate significantly to dependent variables, they were not covaried in any analysis.

Measures

In addition to the measures used to classify the participants, the primary instrument used for this aim was the Diagnostic Interview Schedule for Children (DISC). For a more detailed description of this measure, please see the earlier methods section.

Results:

Prevalence of Oppositional Defiant Disorder

The prevalence rates of ODD found at child ages 5 through 9 are shown in Table 1.2. At age 5, 44.9% of children in the ID group and 35% of children in the borderline group met criteria for ODD, compared with 21.7% of children in the TD group. Similar prevalence rates of ODD were found at ages 6, 7, 8 and 9, with the ID and borderline groups consistently showing higher rates of ODD than the TD controls. The differences between the ID and TD group rates were significant by Chi-square analyses at ages 5, 6, 8 and 9. As seen in Table 1.2, the borderline group tended to have prevalence rates between those of the ID and TD groups, differing significantly from the TD group only at age 9 and not differing significantly from the ID group at any age. The combined variable indicating whether criteria for ODD were “ever met” showed comparable rates for ID (73.5%) and borderline (70%) groups, which were both higher than for the TD group (50.4%) group. Thus, the ID group experienced higher rates of ODD than the TD group across the four-year interval assessed, while the borderline group generally had rates in between the ID and TD groups.

Gender

The prevalence of ODD diagnosis did not differ significantly by child gender in the ID (X^2 values between 0 to 2.52) and borderline groups (X^2 values between 2.95 to 3.59). In the TD group, the only significant difference was at age 9, when, contrary to expectations, a significantly greater percentage of girls than boys met ODD diagnostic criteria ($X^2 = 5.12$, $p = .03$). When the “ever met criteria” variable was examined, there were no gender differences for the TD and ID groups ($X^2 = .23$, $p = .71$ and $X^2 = 1.98$, $p = .20$, respectively). There was a significant relationship between gender and “ever met criteria” for the borderline group ($X^2 = 7.94$, $p = .01$) with more males than females meeting criteria.²

² When we look at the odds ratios for females to males, we find ratios between 1.29 and 1.66 for the TD group (with the exception of OR = 3.06 for age 9), odds ratios between 0.10 and 0.21 for the borderline group and odds ratios

Age of Onset

Of the children who “ever met criteria” for ODD between ages 5 to 9, we coded those who first met criteria at age 5 or 6 as the “early onset” group and those who first met criteria at age 7 or later as the “late onset” group. Although children meeting criteria for ODD at age 5 may have had an earlier onset of the disorder, we have chosen to focus on the first time point at which participants in the study met diagnostic criteria and have referred to this here as the “age of onset.” Table 1.3 shows the breakdown of age of onset by group. Chi-square analyses did not find a relationship between status group and the age of onset of ODD; most children in each status group first met criteria at age 5 or 6.

Stability

Given the binary nature of our data (0 = didn’t meet criteria, 1 = met criteria), we examined the stability of diagnoses of ODD in two ways. First, we used Cohen’s kappa to examine agreement within status group from one age to the next. Table 1.3 shows these statistics. For each group, stability tended to increase over time. Second, we created patterns of stability. Children who met ODD criteria or children who did not meet ODD criteria at 4 or 5 assessments were classified as stable. The remaining children were classified unstable. A chi-square analysis was used to examine group differences in the number of children classified as stable vs. unstable. As shown in Table 1.3, status group was not significantly related to stability of meeting ODD as assessed this way.

Comorbidity

Table 1.4 shows the comorbidity of ODD with any other diagnosis on the DISC. The ID group had a significantly higher rate of comorbidity with other DSM-IV diagnoses than the TD

between .37 and 1.21 for the ID group. Thus, it appears that while there are no significant gender differences (as X^2 values are non-significant), males have higher odds of getting a ODD diagnosis in the borderline and ID groups while females have higher odds in the TD group. The odds ratios for females to males for “ever met criteria” follow the same pattern; males have higher odds in the ID and borderline groups, while females have higher odds in the TD group.

group at every age but 9 years. The borderline group had variable rates of comorbidity with other DSM-IV diagnoses, perhaps attributable to the small sample size. Table 1.4 also shows the comorbidity between ODD and ADHD in the three status groups. Again, the ID group demonstrated a significantly higher rate of comorbidity than the TD group at every year but age 9. The borderline group had variable rates of comorbidity with ADHD.

Risk for ODD over Time

We used multilevel modeling analyses in HLM 6.0 (Bryk & Raudenbush, 1992) to examine if the odds of receiving an ODD diagnosis on the DISC changed over time. We used a logit function to accommodate the binomial/Bernoulli distribution of the dependent variable DISC ODD diagnosis. Results are reported in Table 1.5 with the first column showing the results for a random effects model and the second column showing the final model.

We examined the effects of linear and quadratic time by adding each to level 1 of the model first as fixed and later as random. Time effects were added in a hierarchical fashion with linear time added before quadratic time. Time (both linear and quadratic) was centered on age 5 (the initial time point). We then added two predictors representing status group contrasts between the ID and TD groups and the borderline and TD groups to level 2 of the model. From a model with fixed and random effects of linear time, the fixed effect of linear time was non-significant ($p = .162$) and there was very little variance ($\text{Var}(B_{10}) = .00012$). As a result, linear time was dropped from the model. Similar results were found when examining the fixed and random effects of quadratic time. When quadratic time was included as a fixed effect in a model with linear time and a random intercept, there was no significant effect ($p = .54$). Thus, quadratic time was also dropped from the model. There were no linear or quadratic effects of risk for ODD over time. Significant effects for the two status group variables were found and these were included in the final model

The odds of receiving an ODD diagnosis for children in the TD control group were .22. The odds of receiving an ODD diagnosis were .74 for children with ID and .52 for children with

borderline intellectual functioning. Thus, the odds ratio of an ODD diagnosis for ID children relative to TD children was $.74/.22 = 3.36$. The odds ratio of an ODD diagnosis for children with borderline intellectual functioning relative to TD children was $.52/.22 = 2.36$.

Overall, there were significant status group differences in the odds of receiving a diagnosis, with a higher percentage of ID children receiving the diagnosis than TD children. At a trend level, children with borderline intellectual functioning had higher odds of meeting ODD criteria than TD children. More importantly, these analyses indicated that the odds of meeting criteria for ODD did not change in a consistent manner over time.

Symptoms of ODD

Multiple regression analyses were used to examine group differences in ODD symptom counts for children who met criteria for ODD. Family income and mother's education were covaried when they were related to symptom count (at age 8 for family income and at age 6 for mother's education). There were no status group differences in symptom counts at any age between 5 to 9. At each age all groups endorsed a mean of 4.9 to 5.7 symptoms.

Rank order correlations, shown in Table 1.6, were run to examine group differences in the patterns of endorsing the 8 ODD symptoms. Rank order correlations between groups were high suggesting that the groups endorsed symptoms with similar relative frequency. Chi-square analyses were used to examine group differences in the endorsement of particular items at ages 5 and 9. Some group differences emerged in the specific items endorsed. However, these differences were not consistent across time and could be considered to be an artifact of the number of statistical tests and random variation.

Discussion:

At age 5 years, children with intellectual disabilities (ID) or borderline intellectual functioning (borderline) were almost twice as likely to meet diagnostic criteria for ODD as those with typical development (TD). This difference was generally consistent across the early school years, from child age 5 to 9. The difference in prevalence rates was further reflected in the odds

ratios of meeting criteria for ODD; children with ID and those with borderline intellectual functioning had markedly higher odds of meeting criteria for ODD than children with typical development. There was no consistent change in these odds over time for any of the status groups.

These findings are consistent with the literature and support the assertion that children with ID experience higher rates of behavior disorders in general and ODD in particular. The current study expands upon previous findings in two significant ways. First, rather than assessing children varying widely in age, we assessed a cohort of children all at the same age, and followed them longitudinally for four years. Second, we included a group of children with borderline intellectual functioning, finding that these children also have elevated rates of ODD. The borderline group risk was intermediate between the ID and TD groups.

Beyond risk for ODD, we examined other characteristics of psychiatric disorders typically included in classification schemes: co-morbidity, gender differences, age of onset, and stability over time (APA, 2000). There were significant group differences in the co-morbidity of ODD with any other diagnosis on the DISC, largely accounted for by the co-morbidity with ADHD. Children in the ID and borderline groups had significantly higher rates of co-morbidity than did children with TD. This is consistent with findings that children with ID experience higher rates of co-morbidity in general (Dekker & Koot, 2003; Emerson, 2003). The comorbidity of ODD for children with borderline intellectual functioning, not previously examined in the literature, was quite variable; at some ages these children resembled their typically developing peers and at other times they had even higher rates of co-morbidity than the ID group. These fluctuations may result, at least in part, from the smaller sample size. Future studies with larger samples of children in the borderline range would be important to conduct, as there are many more children in this range than with ID. Moreover, children with borderline cognitive functioning and adaptive behavior may experience additional challenges in

parenting and academic contexts and later in occupational ones (Fenning, et al., 2007; Valliant & Davis, 2000).

Group differences were not found in gender, age of onset, stability of diagnosis, or symptom presentation of ODD. Boys and girls, overall and within each group, met ODD diagnostic criteria at highly similar rates. This is different from much prior research on typically developing children, in which the prevalence of ODD was higher for males than females (APA, 2000; Carlson et al., 1997; McDermott, 1996; Rey, 1993). Yet there continues to be some disagreement over gender differences in the diagnosis of ODD. Some studies did not find significant gender differences in children with TD (Lahey et al., 2000; Lumley et al., 2002) or ID (Einfeld et al., 2010) while others found that gender differences varied by reporter (Maughan, et al., 2004).

Age of onset was also similar, as the majority of children in each group first met criteria for ODD at age 5 or 6. The stability of ODD appeared to increase over time with a higher concordance between diagnostic status from age 8 to 9 than from age 5 to 6. This pattern, however, was similar across status groups; there were no group differences in the number of children with stable versus unstable patterns of meeting criteria for ODD.

For children meeting ODD diagnostic criteria, we examined whether the ways in which criteria were met differed by status group. The number of ODD symptoms endorsed by mothers did not differ for ID, borderline, and TD children. Moreover the frequency with which each of the ODD symptoms was endorsed was similar among the status groups. Too, Baker and colleagues (2010), using data from this same longitudinal study, found that mothers of children with ID and TD meeting criteria for ADHD reported similar patterns of symptom endorsement.

Taken together, the status group similarities in ODD expression by gender, age of onset, stability, and symptom presentation provide support for the view that children with intellectual disabilities/borderline intellectual functioning do not meet criteria for ODD in a qualitatively different manner from their typically developing peers. Further research on the etiology and

outcomes of ODD for children with ID is needed to conclude that the disorder is the same as seen in typically developing children. However, results from the current study represent a step in that direction by illustrating that the clinical presentation of ODD is more similar than different across groups

Limitations

The rates of ODD for children with and without intellectual disability presented in this study are notably larger than the rates of 11.1 and 13.3% previously reported in the literature (Emerson, 2003; Emerson & Hatton, 2007). This discrepancy may relate to differences in the ages of the participants. In both prior studies, the point prevalence of ODD was reported for a large sample of children from 5 to 15 years of age. The inclusion of older children and adolescents in prior studies may have resulted in lower prevalence rates than would be observed in samples of younger children. In particular, research suggests a decline in the prevalence of ODD during early adolescence as a result of the DSM-IV-TR prohibition of ODD diagnoses in individuals who meet criteria for conduct disorder (Maughan, et al., 2004). It is also important to note that DSM-IV-TR prevalence rates for ODD are reported as ranging from 2-16% depending on the methods used. Findings from the current paper are somewhat consistent with the higher end of this range, where children in the TD group show prevalence rates between 20 and 28%.

The coding scheme used to classify children as meeting criteria for ODD may have resulted in the larger prevalence rates reported in the current paper and may have contributed to the lack of gender differences. Following DSM-IV-TR, children were considered to have met criteria for ODD if they experienced four or more symptoms for 6 months or longer. However, impairment and distress were not taken into account and as a result, the current study may have been more inclusive than previous studies. Moreover, a true diagnosis of ODD should meet criteria in multiple settings, and would include not only parent report but also confirmation from a mental health professional (although these multiple criteria are rare in research reports

and don't appear in the previous studies cited for children with ID or borderline intellectual functioning).

Given the possibility that ODD is merely a proxy for behavior problems, the utility of examining the epidemiology of ODD may be questioned (especially given the research clearly establishing higher rates of behavior problems for children with intellectual disabilities). However, we argue that there may not be complete overlap between ODD and behavior problems. In other words, research on ODD supports a distinction between emotional and behavioral symptoms of ODD (Burke, Hipwell, and Loeber, 2010) and a number of studies have supported three dimensions of symptoms – irritable, headstrong and hurtful (Stringaris & Goodman, 2009a; Stringaris & Goodman, 2009b). These dimensions appear to have different comorbidities, with depression and generalized anxiety disorder best predicted by the irritable symptoms, Attention-Deficit Hyperactivity Disorder and Conduct Disorder predicted by the headstrong symptoms, and Conduct Disorder also predicted by the hurtful symptoms. In spite of these differences, there is also considerable evidence that ODD is a single diagnostic entity (Frick, Lahey, Loeber & Tannenbaum, 1993; Loeber et al., 2000). Accordingly, these dimensions of symptoms may correspond to a difference between behavior problems and the interpersonal and affective components that characterizes ODD as a disorder. In this light, it is important to determine that ODD is the same disorder for children with ID and those with borderline intellectual functioning as it is for children with typical development.

Conclusions and Implications

Results from this study are consistent with the view that ODD is the same disorder for children with intellectual disabilities as for children with typical cognitive development. However, children with intellectual disabilities show higher rates of ODD and demonstrate higher rates of comorbidity with other disorders and ADHD in particular. Children with borderline intellectual functioning experience higher rates of ODD and higher comorbidity, although not to the same extent as peers with ID.

Table 1.1.

Demographics by Delay Status at Child Age 5

Demographic	Typically Developing (n=115)	Borderline (n=20)	Intellectual Disability (n=49)	X ² or F Ratio (df)
Child				
Stanford Binet IQ	103.7 (11.6)	76.8 (4.0)	53.1 (10.9)	F = 382.4 (2, 181)**
Vineland Scales of Adaptive Behavior	105.2 (16.0)	71.2 (8.7)	58.0 (8.6)	F = 221.1 (2, 181)**
Gender (% Male)	62 (53.9%)	15 (75.0%)	27 (55.1%)	X ² = 3.14 (N = 184)
Race/Ethnicity (% Caucasian-non Hispanic)	72 (62.6%)	10 (50.0%)	28 (57.1%)	X ² = 1.32 (N=184)
Mother and Family				
Income \$50,000 +	73 (63.5%)	12 (60.0%)	20 (40.8%)	X ² = 7.28 (N=184)*
Mother's Years of Schooling	15.6 (2.3)	15.0 (2.2)	14.2 (1.9)	F = 7.67 (2, 181)**

(*) p < .10* p < .05, ** p < .001

Table 1.2.

Percentage of Children Meeting DISC Cut-off for ODD, by Delay Status

% Children with ODD at:	Typically Developing (n = 115)	Borderline (n = 20)	Intellectual Disability (n = 49)	X ² (df)
Age 5	25 (21.7%) ^a	7 (35.0%) ^{ab}	22 (44.9%) ^b	9.23 (2, N = 184)*
Age 6	29 (25.2%) ^a	7 (35.0%) ^{ab}	21 (42.9%) ^b	5.17 (2, N = 184) ^(*)
Age 7	33 (28.7%)	7 (35.0%)	17 (34.7%)	0.75 (2, N = 184)
Age 8	24 (21.6%) ^a	5 (29.4%) ^{ab}	22 (47.8%) ^b	10.78 (2, N = 174)*
Age 9	22 (20.6%) ^a	7 (43.8%) ^b	16 (39.0%) ^b	7.45 (2, N = 164)*
Ever Met Criteria Age 5-9	58 (50.4%) ^a	14 (70.0%) ^{ab}	36 (73.5%) ^b	8.70 (2, N = 184)*

(*) p < .10* p < .05, ** p < .001

¹Sample size at child age 8 was reduced with TD (n = 111), Borderline (n=17) and DD (n = 46)

²Sample size at child age 9 was reduced with TD (n = 107), Borderline (n = 16) and DD (n = 41)

At each age, percents with different superscripts (a,b,c) were significantly different at p < .05.

Table 1.3.

Age of Onset and Stability of ODD by Delay Status

	Typically Developing	Borderline	Intellectual Disability	X ² (df)
Age of Onset				
Early: % Before or At Age 6 ¹	41 (70.7%)	9 (64.3%)	27 (75.0%)	
Later: % At or after age 7	17 (29.3%)	5 (35.7%)	9 (25.0%)	0.58 (2, N=108)
Stability				
Kappa Age 5 – 6	.32	.56	.54	
Kappa Age 6 – 7	.38	.56	.57	
Kappa Age 7 – 8	.56	.60	.69	
Kappa Age 8 – 9	.54	.73	.64	
Kappa Age 5 – 9	.34	.87	.50	
% Stable Status	86 (74.8%)	15 (75%)	34 (69.4%)	0.54 (2, N=184)

(*) p < .10* p < .05, ** p < .001

¹Age of onset analyses were calculated within the group that met criteria at least once (N = 108)

Table 1.4.

Comorbidity of ODD and All Other Diagnoses or ADHD by Delay Status

	Typically Developing (n = 115)	Borderline (n = 20)	Intellectual Disability (n = 49)	X ² (df)
Child % with any diagnosis				
Age 5	7 (28.0%) ^a	7 (100%) ^b	15 (68.2%) ^c	14.53 (2, N = 54) **
Age 6	6 (20.7%) ^a	5 (71.4%) ^b	13 (61.9%) ^b	11.30 (2, N = 57) **
Age 7	9 (27.3%) ^a	3 (42.9%) ^{ab}	12 (70.6%) ^b	8.64 (2, N = 57) **
Age 8	5 (20.8%) ^a	1 (20.0%) ^{ab}	13 (59.1%) ^b	7.89 (2, N = 51) *
Age 9	10 (45.5%)	3 (42.9%)	11 (68.8%)	2.39 (2, N = 45)
Child % with ADHD diagnosis				
Age 5	6 (24.0%) ^a	6 (85.7%) ^b	13 (59.1%) ^b	10.82 (2, N = 54) **
Age 6	5 (17.2%) ^a	5 (71.4%) ^b	12 (57.1%) ^b	11.81 (2, N = 57) **
Age 7	8 (24.2%) ^a	2 (28.6%) ^{ab}	10 (58.8%) ^b	6.04 (2, N = 57) *
Age 8	3 (12.5%) ^a	1 (20.0%) ^{ab}	11 (50.0%) ^b	8.01 (2, N = 51) *
Age 9	9 (40.9%)	3 (42.9%)	8 (50.0%)	0.32 (2, N = 45)

(*) p < .10 * p < .05, ** p < .001

At each age, percents with different superscripts (a,b,c) were significantly different at p < .05.

Table 1.5.

Modeling Diagnoses of ODD

Fixed Effects	Model 1: Random Intercept Only	Model 2: Final Model
Predictor		
Coefficient (SE)		
Intercept, B ₀₀	-1.11 (.17)**	-1.53 (.22)**
ID, B ₁₀		1.23 (.40)**
BD, B ₂₀		0.88 (.50)(*)
Variance Components		
Intercept, R ₀₀	3.12 (1.77)**	3.01 (1.73)**

(*) $p < .10$ * $p < .05$, ** $p < .001$

Table 1.6.

Rank Order Correlations of ODD Symptoms

Child Age	TD and Borderline	TD and ID	ID and Borderline
Age 5	.78*	.87**	.73*
Age 6	.89**	.63(*)	.54
Age 7	.86**	.69(*)	.90**
Age 8	.83*	.86**	.66(*)
Age 9	.81*	.87**	.76*

(*) $p < .10$ * $p < .05$, ** $p < .001$

Chapter 5: Etiological Model of Oppositional Defiant Disorder

The second aim of this dissertation was to determine whether the etiology of ODD differs between children with and without developmental delays. To achieve this aim, we examined the literature on the etiology of conduct problems and ODD and generated an etiological model with the measures available in the current data set. This model was then tested in the combined sample and in the samples of children with developmental delays (ID and borderline intellectual functioning) and typically developing children separately.

Risk Factors for Conduct Problems

Research on risk factors for conduct problems (often defined as a spectrum of antisocial, aggressive, dishonest, delinquent, defiant and disruptive behaviors) often focus on three domains – child characteristics, parent characteristics, and parent-child interactions. Research has considered these predictors individually, but also within the context of an interactive framework.

Child Characteristics

Temperament is understood as a substantially heritable framework of socio-emotional responding that is apparent early in life (Buss & Plomin, 1975). Within the context of temperament, negative emotionality and fearfulness have been discussed as most closely related to issues of externalizing and internalizing behavior problems (Gilliom & Shaw, 2004). Negative emotionality can be understood as the frequency and intensity of negative moods (Gilliom & Shaw, 2004), while fearfulness/fearlessness can be understood as the child's willingness to approach novel situations and stimuli (Kagan, 1989; Gilliom & Shaw, 2004). Both of these traits appear to vary across individuals and there is substantial research suggesting that both negative emotionality and fearlessness are related to externalizing behavior problems

Temperamental factors are largely believed to impact antisocial behavior and externalizing behavior problems through interactions with the social environment (Bates, Bayles, Bennett, Ridge, & Brown, 1991; Keenan & Shaw, 1995; Shaw & Winslow, 1997; Tremblay, 1992). In

particular, emphasis is placed on parenting behaviors that are likely evoked by a child's difficult temperament – coercive, harsh, nonresponsive and/or inconsistent parenting (Ge et al., 1996; Sanson & Prior, 1999). These evocative parental reactions to the child's temperament appear to be necessary for the emergence of antisocial behaviors (Reid & Patterson, 1989; Patterson et al., 1992).

Another child characteristic associated with conduct problems is child intelligence, particularly verbal intelligence (Lynam, Moffitt, & Stouthamer-Loeber, 1993; Moffitt & Silva, 1988; Stattin & Klackenberg-Larsson, 1993) and there is substantial research suggesting that youth with conduct problems demonstrate IQs that range from half a standard deviation to one standard deviation below average (Lynam & Henry, 2001). The relationship between intelligence and behavior problems appears to function through parenting, and researchers suggest that children with higher IQs are easier for parents to socialize (Keenan & Shaw, 1997; Lahey, Waldman & Burnett, 1999).

Parent Characteristics

Parent variables contributing to an increased risk for conduct problems include a parental history of psychopathology (Lahey, et al., 1999; Frick et al., 1992). Lahey et al., (1999) suggests that parents with antisocial behaviors and those dealing with psychopathology such as substance use and/or depression may have a chronically lower threshold for their child's behavior and may be more likely to respond to oppositional or defiant behavior inappropriately, with harsher discipline, neglect, etc.

Similar to the child characteristics, parent psychopathology is hypothesized to confer risk for future child conduct problems by disrupting parenting practices and increasing the likelihood of inadequate supervision, inconsistent and/or overly punitive punishment, and possibly, neglect (Lahey, et al., 1999; Patterson & Southamer-Loeber, 1984; Frick et al., 1992; August, Realmuto, Joyce, & Hektner, 1999). It is likely that the relationship between parent

characteristics and negative parenting behaviors is due to differences in parents' thresholds for tolerating their child's behavior (Lahey, Conger, Atkeson, Trieber, 1984).

Parent-Child Interactions and the Etiological Model

Considering child and family risk factors together suggests a possible etiological model of conduct problems. Parents with histories of psychopathology are likely to have children with similar personality characteristics. The temperament of these children may be more difficult, such that they experience and express more negative emotions. Likewise, these children may be more likely to engage in misbehavior because of their less fearful temperaments, which do not inhibit them from testing limits and getting into trouble. Parents have lowered thresholds for coping with their children's misbehavior as a result of their own psychopathology and instead of responding adaptively, may be overly harsh in their punishments. Moreover, these parents may also have more lax supervision of their children and/or be inconsistent in their punishment and thus, unable to punish their children in a way that might reduce negative behaviors. Over time, this back-and-forth between parent and child may escalate both the frequency and nature of behavior problems on the part of the child.

There has been some research supporting this parent-child interactional model of conduct problems (Jaffee, Belsky, Harrington, Caspi & Moffitt, 2006; Simons Chao, Conger & Elder, 2004). Simons et al. (2004) used latent growth curve analyses to examine the trajectory of conduct problems over late childhood and adolescence and determine whether a latent trait of impulsivity, risk-taking, and insensitivity to the needs of others explained the increase in conduct problems over time. Simons, et al. (2004) also examined a transactional model in which impulsive and aggressive children interact with their temperamentally similar parents and through increasingly ineffective parenting, engage in more problematic behaviors. Contrasting these models, the authors found evidence for the role of ineffective parenting as a mediator between early child conduct problems and later engagement in antisocial behaviors.

Oppositional Defiant Disorder

Much of the research in this domain has focused on conduct problems or externalizing behavior problems and the author is not aware of any research examining interactions between child temperament and negative parenting in children with Oppositional Defiant Disorder. ODD is often conceptualized as part of a continuum of conduct problems with conduct disorder (CD) and there is some research suggesting that each of the risk factors associated with the development of conduct problems is associated with both CD and ODD when considered separately. However, associations tend to be more robust with CD and it is important to consider how risk factors function in predicting ODD behavior problems only. Thus, research is needed to examine the development of ODD to determine whether the same model of child temperament and ineffective parenting that accounts for more severe conduct problems also accounts for the emergence of ODD.

Oppositional Defiant Disorder in Intellectual Disability

As discussed, children with intellectual disabilities also experience a higher rate of general behavior problems apart from ODD (Baker, Blacher, Crnic & Edelbrock, 2002; Whitaker and Read, 2006). Research suggests that behavior problems may contribute to increased parenting stress in parents of children with ID, and that increased parental stress may lead to subsequent increases in child behavior problems (Baker, et al., 2003; Orsmond, Seltzer, Krauss, & Hong, 2003; Neece, Green & Baker, 2012). Moreover, this link may be mediated by parent-child interactions. Given that much of the research on risk factors for conduct problems highlights negative interactions between parents and children, it may be the case that the higher prevalence of disruptive behavior disorders (and ODD in particular) is the result of increased behavior problems and/or parenting stress that heightens the frequency or intensity of negative interactions.

Hypotheses & Rationale for the Current Study

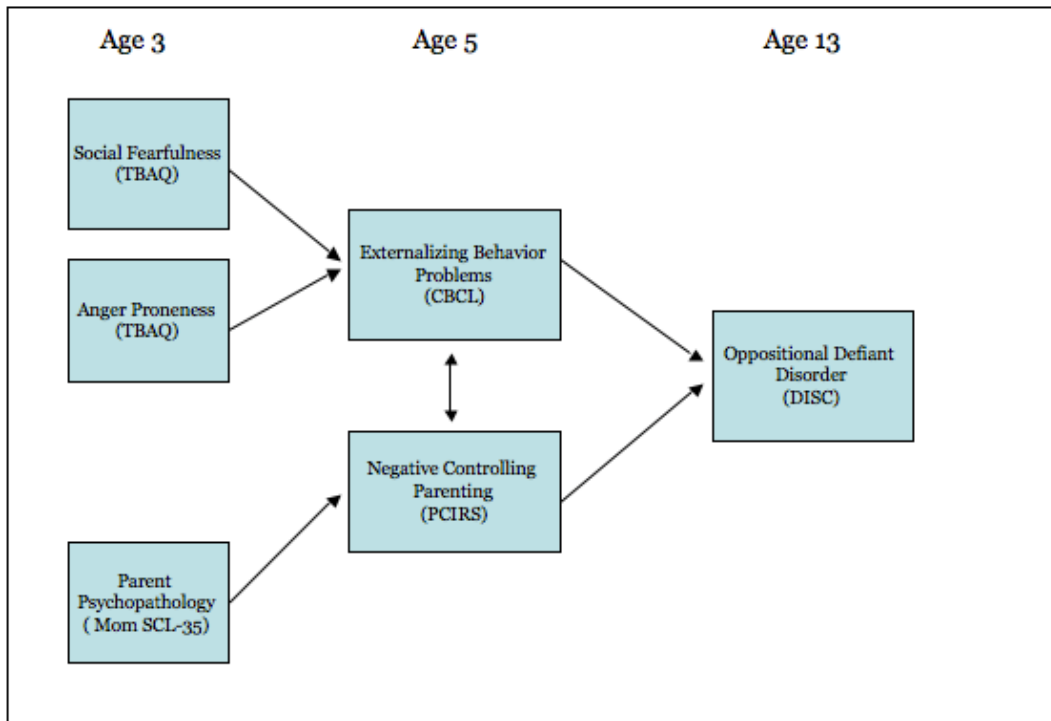
The current study examines the etiology of ODD using data from the Collaborative Family study on families of children with and without developmental delays. We propose a model in which child temperament (negative emotionality and social fearfulness) contributes to later externalizing behaviors while parent psychopathology contributes to negative/controlling parenting behaviors. We suggest that ODD symptoms emerge from the interaction between externalizing behavior problems and negative/controlling parenting behaviors. We examine this model (shown below in Figure 2.1) in the combined sample and separately for children with and without developmental delays. We further examine the contribution of status group to the model by adding it as a predictor with a relationship to later externalizing behavior problems.

Question 2: Does the etiological model of conduct problems hold true for Oppositional Defiant Disorder in typically developing children and children with developmental delays?

Hypotheses:

- *2a.* *The etiological model of ODD (illustrated below) will hold true for typically developing children*
- *2b.* *The etiological model of ODD (illustrated below) will hold true for children with developmental delays.*

Figure 2.1 Theoretical Model



Brief Method:

Participants

The data used for this aim of the study are from the 90 of the original 238 families (TD n= 70; DD n=20) who met inclusion criteria, i.e. those who completed the necessary measures at child ages 3, 5 and 13.

At child age 13, participants were classified as typically developing (TD) if they had a score on the Wechsler Intelligence Scales for Children (WISC IV; Wechsler, 2003) of 85 or above. Participants were classified as borderline intellectual functioning (APA, 2000) if they scored between 71 and 84 on the WISC and below 85 on the Vineland Scales of Adaptive Behavior (VABS), and they were classified as intellectually disabled (ID) if they scored below 71 on the WISC and below 85 on the VABS³. For the purpose of this paper, children with borderline intellectual functioning and those with intellectual disabilities were combined into

³ On the Vineland Scales of Adaptive Behavior, a score of 85 represents one standard deviation below the mean. The definition of intellectual disability stipulates deficits in adaptive behavior, but not to any extent (APA, 2000)

one group (termed Developmental Delay, DD) to increase power. Combining these groups is supported by prior research suggesting that children with borderline intellectual functioning experience rates of emotional and behavior problems that are similar to children with ID (Fenning, Baker, Baker & Crnic, 2007; Emerson, Einfeld & Stancliffe, 2011).

Table 2.1 shows demographic characteristics at child age 13 by developmental status group (TD and DD). Child gender was not associated with status group. Child race, family income and mothers' education were significantly related to group status. The TD group had a higher percentage of Caucasian families, more families with an annual income of \$50,000 or higher, and mothers who completed significantly more years of school. Mother's education did not have a significant relationship with any of the variables of interest in our model. Child race had a significant relationship with Anger Proneness on the TBAQ only. However, family income related significantly to externalizing behavior problems on the CBCL, ODD symptoms on the DISC, Anger Proneness on the TBAQ and parent psychopathology on the SCL. We did not covary any of these demographic variables in the analyses because of limitations related to the sample size and the number of pathways specified in the models. However, the relationship between family income and the aforementioned variables is supported by previous research and should be considered in future models that expand upon the models we examined.

Measures

In addition to the measures used to classify the participants, the primary instruments used for this aim were the Toddler Behavior Assessment Questionnaire (TBAQ), the Symptom Checklist-35 (SCL), the Child Behavior Checklist (CBCL), the Parent-Child Interaction Rating System (PCIRS) and the Diagnostic Interview Schedule for Children (DISC).

Results:

Prior to examining the predicted model, we ran bivariate correlations in SPSS Version 18 to confirm expected relationships between predictor and outcome variables. Table 2.2 shows these analyses, conducted with the whole data set, including data from children with and

without developmental delays. Overall, results suggest that anger proneness on the Toddler Behavior Assessment Questionnaire was significantly related to the Externalizing Behavior Problem subscale of the CBCL at age 5 and to the number of ODD symptoms on the DISC at age 13. However, social fearfulness on the TBAQ was not related to CBCL Externalizing Behavior Problems or ODD symptoms. The total score from the Symptom Checklist-35 was significantly related to TBAQ Anger Proneness at age 3, negative/controlling parenting behavior on the PCIRS at age 5, CBCL Externalizing Behavior Problems at age 5 and ODD symptoms on the DISC at age 13. Interestingly, negative/controlling parenting behavior as measured by the mother's scores on the PCIRS was not related to ODD symptoms at age 13 or CBCL Externalizing Behavior Problems at age 5.

Following this, we examined the theoretical model (Figure 2.1) in the total data set using MPlus software. Figure 2.2 depicts the model we ran and Figure 2.3 depicts the results of this model with only the significant pathways included. Anger proneness at age 3 relates to externalizing behavior at age 5. Parent psychopathology at child age 3 relates to parenting behaviors at age 5. Externalizing behavior mediates the relationship between anger proneness at age 3 and ODD symptoms at age 13 (as the direct relationship between anger proneness and ODD symptoms no longer exists). Surprisingly, there is a significant negative relationship between negative/controlling parenting behaviors and child externalizing behavior. Moreover, there continues to be no relationship between parenting behaviors at age 5 and ODD symptoms at age 13.

As shown in Table 2.3, measures of the variance explained for the dependent variables of the model (by the model's paths to that variable) suggest that 30% of the variance in CBCL externalizing problems is explained by the paths in model ($p < .001$) and 10% of the variance in negative parenting behavior is explained by the model ($p = .11$). More importantly, it appears that 18% of the variance in oppositional defiant symptoms is explained by the current model ($p = .018$). When we examine the overall fit statistics of the model, we find that some indices

indicate good fit, while others do not. The model's fit statistics are Chi-square/degree of freedom ratio = 2.47, Comparative Fit Index (CFI) = .92, Root Mean Square Error of Approximation (RMSEA) = .13 and Standardized Root Mean Square Residual (SRMR) = .047. These values are contrasted with cut-offs discussed in the literature of <3 for the Chi-square/degree of freedom ratio (Carmines & McIver, 1981), CFI $>.90$ (Tanaka, 1987), RMSEA $<.05$ (Browne & Cudeck, 1993) and SRMR $<.08$ (Browne & Cudeck, 1993; Hu & Bentler, 1999). According to all but the RMSEA, the model is a good fit for the data. Of note, there is some indication that RMSEA values may be subject to sampling error for models with small degrees of freedom and low sample sizes (Kenny, Kaniskan, & McCoach, 2011). As such, some researchers elect not to use the RMSEA or to focus on the confidence interval instead. In the current model, the 90% confidence interval is quite large (0.00 to 0.249), but includes zero, further suggesting that the model may be a good fit for the data.

Next, we examined the aforementioned model in the two status groups separately. For the TD group, all of the significant pathways remained the same, with three exceptions. First, in this model, there is a significant negative relationship between social fearfulness and externalizing behavior problems. Second, there is no longer a significant negative relationship between negative/controlling parenting behaviors and externalizing behavior problems. Finally, the pathways between externalizing problems at age 5 and ODD symptoms at age 13, and between parent psychopathology and negative/controlling parenting dropped to trend level significance. This is at least in part the result of the decrease in sample size and the subsequent increase in standard errors. The variance explained in negative/controlling parenting, externalizing behavior problems and ODD symptoms was 4% (ns), 28% ($p = .004$) and 17% ($p = .04$), respectively. Generally, the fit statistics were within acceptable range with a Chi-square/degree of freedom = 1.96, CFI = 0.91, RMSEA = 0.12 and SRMR = 0.057.

For the DD group, all of the significant pathways remained the same as the combined sample's model. However, the relationship between externalizing behavior problems and ODD

symptoms dropped from significant to a trend level. Again, this is likely the result of larger standard errors due to the smaller sample size (as evidenced by the fact that the parameter estimate was larger than in the combined sample). The variance explained in negative/controlling parenting, externalizing behavior problems and ODD symptoms was 40% ($p=.004$), 31% ($p = .02$) and 47% ($p=.08$), respectively. However, the fit statistics were not within an acceptable range with a Chi-square/degree of freedom = 5.45, CFI = 0.60, RMSEA = 0.48 and SRMR = 0.227. This is likely the result of the very small sample size for this group ($n=19$).

Finally, we examined a predicted model (Figure 2.4) that includes developmental delay as a variable impacting the rate of externalizing behavior problems. Figure 2.5 depicts the results of this model with only the significant pathways included. Anger proneness at age 3 relates to externalizing behavior at age 5 and parent psychopathology at child age 3 relates to negative/controlling parenting behaviors at age 5. Status has a significant contribution to externalizing behavior, and externalizing behavior appears to mediate the relationships between anger proneness at age 3 and ODD symptoms at age 13. Again, there was a negative relationship between externalizing behavior problems and negative/controlling parenting behaviors at age 5. There continues to be no relationship between parenting behaviors at age 5 and ODD symptoms at age 13.

As shown in Table 2.4, measures of the variance explained by the model suggest that 33% of the variance in CBCL externalizing problems is explained by the model ($p < .001$) and 10% of the variance in negative parenting behavior is explained by the model ($p < .10$). More importantly, it appears that 18% of the variance in oppositional defiant symptoms is explained by the current model ($p = .02$). When we examined the overall fit statistics of the model, however, we found that some of the fit indices were poor. The model's fit statistics were Chi-square/degree of freedom ratio = 2.26, Comparative Fit Index (CFI) = .89, RMSEA = .12 and SRMR = .053. Accordingly, while the model explains significant variance in our dependent

variables, it may not be a good fit for our data as only two of the four indices are above the reported criteria. Moreover, while greater variance in externalizing behavior is explained by the addition of status to the model, this is minimal and there is no change in variance explained for ODD symptoms.

Discussion:

The results suggest that there are significant relationships between measures of early childhood temperament and later ODD symptoms for children with and without DD. In particular, anger proneness on the TBAQ at age 3 was significantly related to later symptoms of ODD on the DISC regardless of status group. This is consistent with prior research linking measures of negative emotionality in early childhood to later conduct problems. Of interest, however, we find a significant negative relationship between social fearfulness and ODD symptoms in the TD sample only. For the DD group, this relationship is non-significant. Accordingly, it appears that while social fearfulness relates to fewer ODD symptoms for children with typical development, this is not the case for children with ID. Instead, it may be that ODD symptoms in children with ID occur more as a function of their communication deficits in combination with negative emotionality, and thus, that social inhibition is unlikely to decrease these behaviors.

When measures of temperament are examined within the proposed etiological model, the relationship between anger proneness at age 3 and ODD symptoms at age 13 appears to be fully mediated by CBCL externalizing behavior problems assessed here at age 5 (as the prior relationship between anger proneness and ODD symptoms disappears when externalizing behavior problems is added). In many ways, this finding appears intuitive and much of the literature supports relationships between measures of negative emotionality and later behavior problems beyond a specific relationship to conduct disorder/conduct problems. However, it is also possible that the results simply reflect the strong relationship between externalizing

behavior problems and ODD and not a path by which children develop ODD (e.g. demonstrating a broad array of behavior problems prior to developing ODD).

Our results also support a relationship between parent psychopathology on the SCL-35 at age 3 and ODD symptoms at age 13. However, this relationship was only significant when these variables were considered alone. When included in a model with child temperament, there was no longer a direct relationship between parent psychopathology at age 3 and ODD symptoms at age 13. Thus, it appears that the relationship between parent psychopathology and ODD may be fully mediated by the child's temperament; the strong relationships between parent psychopathology and child temperament seen in the final model is evidence for this. Accordingly, it may be that parent psychopathology relates to child temperament and that the latter is related to later externalizing behavior problems and ODD.

We also found a significant relationship between parent psychopathology as measured by the SCL-35 and negative/controlling parenting behaviors on the PCIRS. This relationship is consistent with previous research suggesting that parents with antisocial behaviors and those dealing with psychopathology such as substance use and/or depression may have a chronically lower threshold for misbehavior and be more likely to respond in a harsh or negative way (Lahey, et al., 1999).

Interestingly, there appears to be a negative relationship between negative/controlling parenting and externalizing behavior problems, a finding that is somewhat counterintuitive (as one would expect more externalizing behavior problems in response to higher levels of negative/controlling parenting). However, when we look at the two status groups separately, it appears that this relationship is driven by the DD group (and non-significant for the TD group). Previous research suggests that parents of children with DD may be more intrusive than parents of typically developing children (e.g. Herman & Shantz, 1983; Marfo, 1992). Moreover, this parental intrusiveness may be beneficial for children with DD depending upon the purpose served by the parent's behavior and the level of sensitivity to their child's needs and goals

(Cielinski, Vaughn, Seifer & Conteras, 1995). Accordingly, the negative relationship between negative/controlling parenting and externalizing behavior problems may reflect the positive impact of parental intrusiveness for children with DD – a benefit that does not occur for children with typical development.

There was a non-significant relationship between negative/controlling parenting and later ODD symptoms at age 13. This non-significant relationship (as well as the counterintuitive relationship between negative/controlling parenting and externalizing behavior problems) may be explained by the variable used to measure negative-controlling parenting, the PCIRS. The advantage of the PCIRS is that it is a live-coded interaction between mother and child that involves a variety of tasks that range in difficulty. In this way, the PCIRS is able to capture interactions between the mother and child during activities that elicit some amount of struggle and/or conflict. However, given the nature of the task – being observed and videotaped, involving academic tasks and/or games – it is unlikely to elicit the overly critical, harsh or inconsistent discipline that may be characteristic of some parents of children with ODD. This in turn may explain the lack of relationship between parenting behaviors as measured by the PCIRS and ODD symptoms on the DISC and may partially explain the negative relationship between negative/controlling parenting and externalizing behaviors. Instead, different measures/instruments may be necessary to truly evaluate this relationship and to capture the parenting behaviors that may result in higher behaviors problems and ODD symptoms.

Taking the model as a whole, we find that the aforementioned predictors explain a significant amount of the variance in externalizing behavior problems and ODD symptoms. Moreover, our model appears to largely fit the data in the combined sample and for the TD group alone. However, the fit indices for the model with status as a predictor (model 2) and for the DD group alone suggest that our model may fail to sufficiently capture the relationships present in the data. To some degree, the poor fit indices may reflect the smaller sample sizes,

particularly in the DD group. However, it may be that we are missing important elements from an etiological model of ODD for children with DD. As mentioned previously, it may be the case that our poor fit is partially attributable to our inability to capture truly harsh, critical and/or inconsistent parenting through the PCIRS.

When we add status group to the model, we find a significant contribution of status to the level of externalizing behavior problems. This is consistent with the literature on intellectual disabilities, which suggests that children and adolescents with ID demonstrate substantially higher rates of behavior problems than typically developing youth (Baker, Blacher, Crnic & Edelbrock, 2002; Einfeld & Tonge, 1996; Whitaker & Read, 2006). Moreover, by adding status group to the model, we also increase the proportion of variance explained. This increase is negligible for ODD symptoms and parenting behaviors. However, there is a larger, although still relatively small, increase in variance explained for externalizing behavior problems.

Limitations

There are a few limitations that require consideration when interpreting the results of the current study. As a result of the 10-year span of data included in the analyses, many of the original participants did not have sufficient data to be included. Accordingly, our sample size, particularly in the DD group, is small. Although we were able to examine the model in the two groups separately, our small sample sizes may have resulted in biased estimates and larger standard errors. Accordingly, a number of findings failed to reach significance and we are limited in our ability to generalize our findings and conclusions beyond the current sample. Likewise, the model fit indices may be biased and thus, limit our ability to determine the true fit of the proposed model. Future research may replicate the current study by examining a larger sample and thereby addressing our primary question more fully. Nonetheless, our results suggest that much of the model holds true for ODD and suggests a way in which having an intellectual disability may contribute to etiology of ODD and result in higher prevalence rates for this population.

As discussed, another limitation of the current study may relate to the instrument used to measure parenting behavior. Although the PCIRS allows for a detailed coding of a live interaction between mother and child, it likely does not capture the harsh, critical or inconsistent parenting practices that may relate to later ODD. It is possible that the relationship between parenting behavior and later ODD is not present for our sample. However, it is also possible that our measure of parenting has simply failed to capture the more extreme disciplinary behaviors that do relate to later ODD.

Conclusion and Future Directions

Overall, our findings provide support for an etiological model of ODD that is largely consistent with previously described models for conduct problems. We find that temperament, and anger proneness in particular, plays an important role in the development of externalizing behavior problems and later, ODD symptoms. Likewise, we find that parent psychopathology may contribute to later ODD through child temperament. However, while we find connections between parent psychopathology and parenting behavior, we find counterintuitive and/or non-significant relationships parenting behavior and externalizing behavior problems and/or ODD. For children with DD, the negative relationship between negative/controlling parenting and externalizing behavior problems may be explained by the benefit of parental intrusiveness. Nonetheless, we find no relationship between negative/controlling behavior and later ODD symptoms even when considered alone. In this way, our findings do not replicate the proposed model for the development of ODD or prior models of Conduct Disorder/conduct problems.

There is some indication that our parenting measure may have failed to capture the behaviors that contribute to ODD symptoms. In this light, future research may emphasize alternative approaches to capturing parenting behavior and disciplinary practices in particular in order to capture the mechanism by which parent psychopathology impacts child behavior. Without this information, it is difficult to identify points of interventions for ODD and many of

the significant predictors in our model may or may not be amenable to treatment (e.g. early temperament).

Table 2.1.

Demographics by Delay Status at Child Age 13

Demographic	Typically Developing (n=70)	Intellectual Disability (n=20)	X ² or t(df)
Child			
WISC-IV IQ	109.3 (12.1)	61.1 (14.0)	t = 14.53 (85)***
Vineland Scales of Adaptive Behavior	95.8 (9.5)	72.1 (14.3)	t = 8.05 (75)***
Gender (% Male)	41 (58.6%)	10 (52.6%)	X ² = 0.22 (N = 89)
Race/Ethnicity (% Caucasian-non Hispanic)	46 (65.7%)	7 (36.8%)	X ² = 5.17 (N=89)*
Mother and Family			
Income \$50,000 +	57 (81.4%)	11 (57.8%)	X ² = 4.59 (N=98)(*)
Mother's Years of Schooling	16.3 (2.3)	14.4 (2.2)	t = 3.03 (85)**

(*) p < .10, * p < .05, ** p < .01, *** p < .001

Table 2.2.

A Priori Correlation Table

	Status Group	ODD Symptoms	External. BPs	TBAQ Social Fear	TBAQ Anger Prone	Mother SCL Total	Neg/ Control. Parenting
Status Group (0= TD; 1=DD)	1	.10	.30**	.18	.33***	.07	.18
ODD Symptoms		1	.49***	-.12	.40***	.36***	.10
Externalizing BPs			1	-.08	.62***	.45***	.05
TBAQ Social Fear				1	-.01	-.23*	-.10
TBAQ Anger Proneness					1	.33***	.14
Mother SCL Total						1	.28**

(*) p < .10, * p < .05, ** p < .01, *** p < .001

Table 2.3.

Variance Explained in the Dependent Variables of Model 1 (without Status Group)

Outcome Variable	R ² Estimate	S.E.	Est./S.E.
CBCL Externalizing	0.30	0.08	3.65***
Negative Parenting	0.10	0.06	1.60
Oppositional Sx	0.18	0.07	2.37*

(*) p < .10, * p < .05, ** p < .01, *** p < .001

Table 2.4.

Variance Explained in the Dependent Variables of Model 2 (with Status Group)

Variable	R ² Estimate	S.E.	Est./S.E.
CBCL Externalizing	0.33	0.08	4.09***
Negative Parenting	0.10	0.06	1.70(*)
Oppositional Sx	0.18	0.07	2.37*

(*) p < .10, * p < .05, ** p < .01, *** p < .001

Figure 2.2. Predicted Model 1

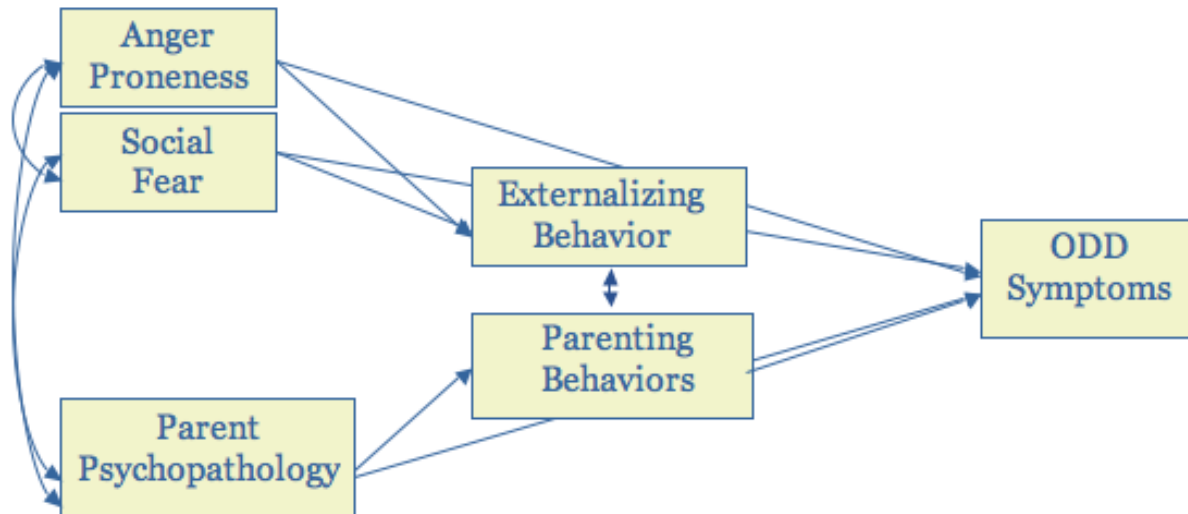
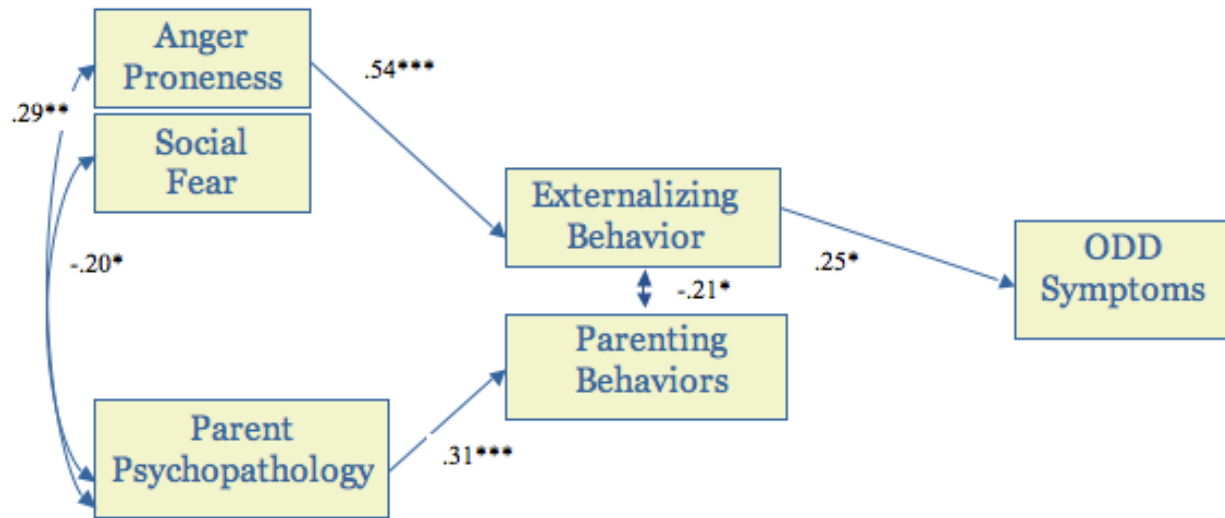


Figure 2.3. Final Model 1



(*) $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$

Note: Only the significant pathways are shown.

Figure 2.4. Predicted Model 2

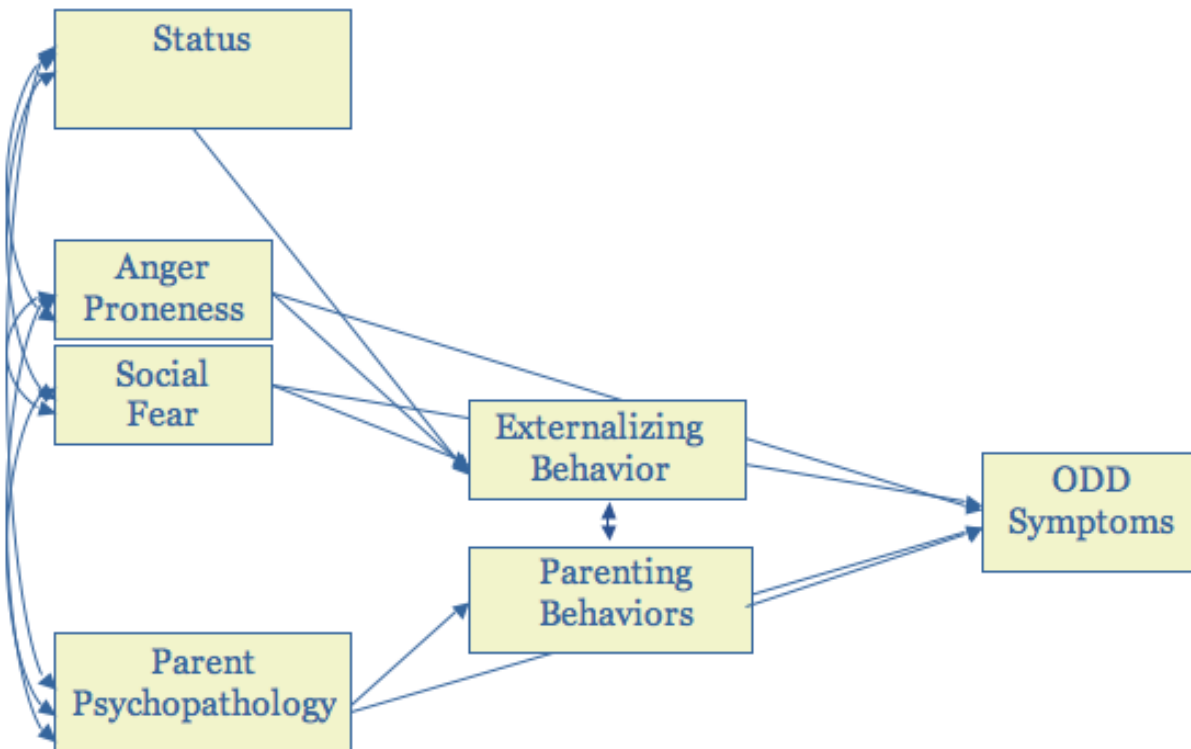
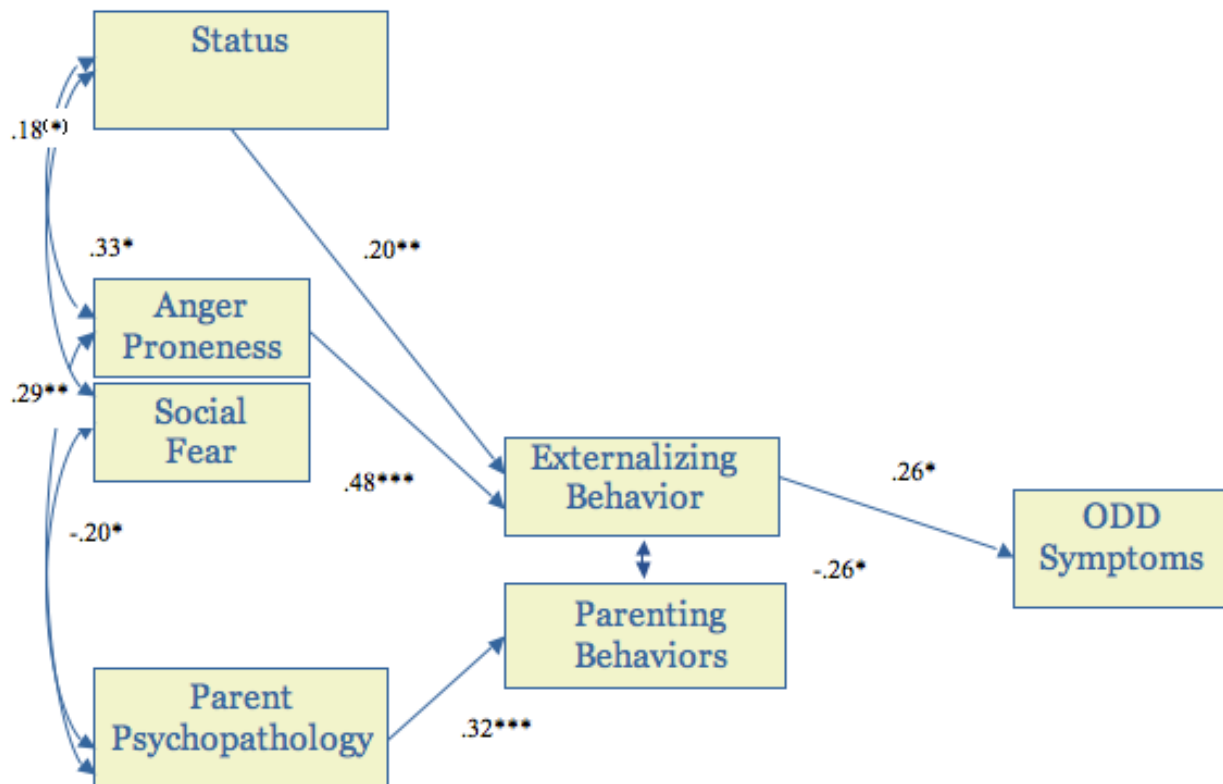


Figure 2.5. Final Model 2



(*) $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$

Note: Only the significant pathways are shown.

Chapter 6: Relationship between Oppositional Defiant Disorder and Other Behavior Problems

The third aim of this dissertation was to examine similarities and differences in outcomes for children with ODD with and without developmental delays. To address this aim, we examined the relationship between ODD and different types of behavior problems to determine whether these relationships differ between children with intellectual disabilities, children with borderline intellectual functioning and typically developing children.

Behavior Problems Over Time

Behavior problems appear to be relatively stable over time for both children with developmental delays (Baker et al., 2003) and typically developing children (Campbell et al., 1991; Campbell, 1994a, Campbell et al., 1994b; Campbell & Ewing, 1990; Egeland et al., 1990; Lavigne et al., 1998; McGee et al, 1991), and youth rated as having high levels of behavior problems maintain their relative rank over time. At the same time, researchers modeling trajectories in children with typical development find that externalizing behavior problems tend to decrease over the course of early and middle childhood, while internalizing problems increase (Mathieson, Sanson, Stoolmiller & Karevold, 2009; Mesman et al., 2009).

Similar trajectories of behavior problems are found in children with ID. De Ruiter, Dekker, Verhulst & Koot (2007) examined trajectories of 11 scales of behavior problems as measured by the Child Behavior Checklist (CBCL; Achenbach, 1991) for a sample of 978 children with ID and 2,047 children without ID between 6-18 years of age. Findings suggest that children with ID experience a higher level of behavior problems across all domains than typically developing children. Total behavior problems as well as externalizing problems, anxious/depressed symptoms, aggressive behavior, attention problems and social problem all appear to decrease over time for children with and without ID. Likewise, somatic complaints and internalizing behavior problems increase over time for children with and without ID. Children with ID appear to have steeper declines in aggressive behavior, attention problems,

social problems and externalizing behavior than typically developing children. One of the limitations of this study, however, was the use of only three time points over a 5-year time span. As the authors mention, only linear time trends can be examined in cases where the maximum number of assessments is three. Moreover, different ages were examined for each participant. Thus, additional research is needed to examine the possibility of curvilinear growth in behavior problems in these groups. The current study builds on previous research by examining five time points between ages 5-9 and thus, allows for quadratic models of change over time. Moreover, de Ruiter, et al., (2007) did not address the trajectory of behavior problems in children with borderline intellectual functioning, which the current study will do.

Oppositional Defiant Disorder and Behavior Problems

Children with ID and a comorbid mental health disorders are at risk for a higher number of behavior problems than would be predicted based on the intellectual disability alone (Felce, Kerr, Hastings, 2009). However, the author is not aware of any studies that have examined the relationship of comorbid psychopathology to behavior problems over time. Accordingly, the current study may be the first to examine the relationship between ODD and trajectories of different types of behavior problems. It is expected that the impact of ODD diagnoses will differ by the type of behavior problems. For example, we speculate that having a diagnosis of ODD will have a stronger relationship to externalizing as opposed to internalizing behavior problems. It is unknown whether the relationship of ODD to different types of behavior problems will interact with status group. However, it is expected that the relationship between behavior problems and ODD will be the same for children with and without developmental delays if ODD is the same disorder in both populations.

Hypotheses & Rationale for the Current Study

The current study addresses three questions. First, are there differences in behavior problems over time between children with and without intellectual disabilities? Second, what is the relationship between ODD and different types of behavior problems over time? Third, does

this relationship differ between children with and without ID? To address these questions, we modeled internalizing behavior problems, externalizing behavior problems, and social problems over time after removing the items from each scale that measure oppositional defiant behavior. Furthermore, we examine ODD diagnosis as a time-varying predictor of a child's behavior problems at each point in time as well as consider the effect of having ODD at any point during middle childhood on the intercept and slope of behavior problems over time. The interaction of predictors of group status and ODD diagnosis addresses whether the relationship between ODD and behavior problems differs between children with intellectual disabilities, children with borderline intellectual functioning, and typically developing children.

Question 3: How do behavior problems over time differ between children with intellectual disabilities, children with borderline intellectual functioning and typically developing children?

Hypotheses:

- *3a. Trajectories of behavior problems will follow the same patterns as seen in de Ruiter, Dekker, Verhulst & Koot, (2007).*
 - *3a-1. Externalizing behavior problems will decrease from age 5 to age 9 in children with and without ID. Children with ID will experience a steeper trajectory of decreasing externalizing behavior problems than typically developing children (per findings by de Ruiter, 2007).*
 - *3a-2. Internalizing behavior problems will increase from age 5 to age 9 in children with and without ID.*
 - *3a-3. Social problems will decrease from age 5 to age 9 in children with and without ID. Children with ID will experience a steeper trajectory of decreasing social problems than typically developing children.*
- *3b. Children with ID will demonstrate higher rates of each type of behavior problem regardless of age.*

Given that previous research has not examined trajectories of behavior problems for children with borderline intellectual functioning, this question serves an exploratory purpose.

Question 4 & 5: What is the relationship between ODD and behavior problems over time and does this relationship differ across status groups?

As discussed, there is no evidence to suggest what the relationship between ODD and behavior problems will be and whether this relationship differs for the three groups.

Brief Method:

Participants

The data reported in this aim of the study are from the 191 of the original 238 families (TD n= 115; Borderline n =27; ID n=49) who met inclusion criteria, i.e. those who completed the age 5 assessment and at least 2 of the 4 assessments between child ages 6 and 9.

The children were classified based on scores on the SB-IV and VABS at child age 5, the first year considered in the present study. Although the children were followed through age 13, only data from ages 5-9 was used for the current analyses

Table 3.1 shows demographic characteristics at child age 5 by developmental status group (TD, Borderline and ID). Child gender was not associated with status group and at least 50% of the participants in each group were male. Likewise, race/ethnicity did not differ across status group and approximately 50% of participants in each group were Caucasian. However, family income and mothers' education were significantly related to group status. The TD group had more families with an annual income of \$50,000 or higher than the ID and Borderline groups, and mothers in the TD group completed significantly more years of school than mothers in the ID and Borderline groups. Mother's education was not related to any of the outcomes of interest. However, family income was related to all three CBCL subscales and was included in analyses as appropriate.

Measures

In addition to the measures used to classify the participants, the primary instruments used for this aim were the Child Behavior Checklist (CBCL – versions for ages 1 ½ to 5 and for ages 6 to 18) and the Diagnostic Interview Schedule for Children (DISC).

Data Preparation:

There is a high overlap in items between the two versions of the CBCL (for ages 1 ½ to 5 and for ages 6 to 18) and previous research has suggested that the scales are highly equivalent (e.g., Tan, 2011). Nonetheless, as these two versions differ in the total number of items, some preparation was needed to allow for the modeling of behavior problems from age 5 through age 9. Following a paper by Neece, Green and Baker (2012), we divided the sum score for each scale by the number of items and used this mean item score in analyses of behavior problem trajectories.

The CBCL also includes a DSM-oriented scale to measure ODD and this subscale contains items that directly assess ODD symptoms and/or behaviors that fall clearly under symptom descriptions (e.g. argues, disobedient at home, disobedient at school, stubborn, has a temper). In addition to the ODD scale, these items also load onto the Externalizing Behavior Problems subscale. Accordingly, for this scale, we removed those items from the Externalizing Behavior Problems subscale that load onto the ODD subscale in order to examine the relationship between ODD and other behavior problems. Once these items were removed, the aforementioned scale was examined for internal consistency. Cronbach's alpha for the Externalizing Behavior Problems scale at each age was between 0.87 and 0.96.

Results:

We used multilevel modeling analyses in HLM 6.0 (Bryk & Raudenbush, 1992) to examine the impact of a) having an intellectual disability and b) having an ODD diagnosis on the intercept and slope of behavior problems over time. We also examined the interaction between these two variables on the intercept and slope to address the question of whether the impact of

ODD differs for children with and without ID. Our outcome variables included the CBCL Externalizing Behavior Problems, Internalizing Problems and Social Problems indices. Results are reported in Tables 3.2 through 3.4 with the first column showing the results for a random effects model and the second column showing the final model.

For each outcome variable⁴, we used the same process to arrive at a final model. First, we examined the effects of linear and quadratic time by adding each to level 1 of the model first as fixed and later as random. Time effects were added in a hierarchical fashion with linear time added before quadratic time. Time (both linear and quadratic) was centered on age 5 (the initial time point). We then added two dummy-coded predictors representing status group contrasts between the ID and TD groups and the borderline and TD groups to level 2 of the model. The effect of status group was examined for the intercept first and then the slope. Next, a time-varying predictor of ODD diagnosis was added to the model to account for ODD diagnoses made on the DISC at each time point. A separate predictor representing having “Ever Met” ODD diagnosis was then added to level 2 of the model, first on the intercept and next on the slope. The purpose of having these two separate variables was to capture the effect of having an ODD diagnosis at any given time point (time-varying variable) as well as the overall effect of having met ODD criteria at any point (“Ever Met”). With regard to the latter variable, it is possible that children who meet ODD criteria at any point between ages 5-9 demonstrate a higher rate of

⁴ Typically, multilevel modeling techniques assume that the level one error variance is the same for all time points and that there is no covariance between the errors at different time points. In longitudinal studies, such as this one, these assumptions are often not met as observations that are temporally close to one another may be correlated and the variance of the errors may differ across time points/ To determine the appropriate error structure for the current study, we considered previous literature on behavior problems over time to suggest possible models. As discussed, behavior problems in typically developing children and children with developmental disabilities appear stable across time and researcher find high correlations between measures of behavior problems at assessments one year apart (Baker, et al., 2003). We ran an empty model for each of the continuous and normally distributed dependent variables using the homogeneous, unrestricted, and autoregressive error structures. Estimates of the fixed effects were comparable across the different models. Model comparisons of nested error structures (homogeneous and autoregressive) suggest that the auto-regressive error structure was not a consistent improvement compared to the homogeneous error structure. Although it was a significant improvement for social problems, the two error structures did not differ for internalizing problems and the homogenous error structure was a better fit for externalizing behavior problems. The unrestricted error structure was also examined, although we decided against this structure because it places all error variance at level one and thus, will not allow modeling of level two random effects. Ultimately, we decided on the homogenous error structure because it seemed both to fit the data and the theoretical model best.

behavior problems even when not currently meeting ODD criteria. As these variables may explain the same variability in outcome, we examined them separately as necessary to prevent one from canceling out the effect of the other. Finally, we looked at cross-level interactions between time (linear and quadratic) and the dummy-coded status group variables and between ODD diagnosis and the dummy-coded status group variables. Non-significant fixed effects were dropped from the final model, with the exception that those fixed effects on level one that had any meaningful variance on level two when specified as random were retained in the model as fixed and random.

Externalizing Behavior Problems⁵

For the CBCL Externalizing Behavior Problems index, we found significant effects for linear and quadratic time trends. We found a trend level effect of status group on the intercept, but not the slope. We also found significant effects for ODD diagnosis, both the time-varying and “ever met” variables. Examining the cross-level interactions between the dummy-coded group contrast variables for ID and Borderline children and ODD diagnosis, there were no significant interactions. The final model (A) is given below. All of the fixed effect estimates and variance components are reported in Table 3.2 and Figure 3.1 depicts the final model for CBCL Externalizing Behavior Problems over time.

$$(A) \quad \text{Level 1: } Y = P_{0i} + P_{1i}(\text{Time_centered}) + P_{2i}(\text{Time_centered}^2) + P_{3i}(\text{ODD Diagnosis}) + E_{ti}$$

$$\text{Level 2: } P_{0i} = B_{00} + B_{01}(\text{“Ever Met” ODD}) + B_{02}(\text{Borderline}) + B_{03}(\text{ID}) + R_{00}$$

$$P_{1i} = B_{10} + R_{10}$$

$$P_{2i} = B_{20} + R_{20}$$

$$P_{3i} = B_{30}$$

As shown in Figure 3.1, there is a negative linear time trend and positive acceleration such that externalizing behavior problems decrease and then gradually increase over time.

Children with ID and those with borderline intellectual functioning have higher rates of

⁵ The results for the total behavior problems were identical to those for externalizing behavior problems. Given the high overlap between the total problem and externalizing behavior problems scales, these results are not shown.

externalizing problems than children with typical development (although this drops to non-significant in the final model). Moreover, the slope of their trajectories across time are the same. Having ever received an ODD diagnosis also results in a higher number of externalizing problems and meeting ODD criteria at any particular time point leads to a significant increase in the number of externalizing problems at that time. However, the impact of ODD (by either variable) does not differ for children with and without ID.

Internalizing Problems

For the CBCL Internalizing Problems index, we found significant effects for linear and quadratic time trends. We also found a significant effect of having ever received an ODD diagnosis on the intercept, but not on the slope. There were no significant effects for status group (on the intercept or slope) nor was there an effect for the time-varying ODD diagnosis variable. The final model (B) is given below. All of the fixed effect estimates and variance components are reported in Table 3.3 and Figure 3.2 depicts the final model for CBCL Internalizing Problems over time.

$$(B) \quad \text{Level 1: } Y = P_{0i} + P_{1i}(\text{Time_centered}) + P_{2i}(\text{Time_centered}^2) + E_{ti}$$

$$\text{Level 2: } P_{0i} = B_{00} + B_{01}(\text{“Ever Met” ODD}) + R_{00}$$

$$P_{1i} = B_{10} + R_{10}$$

$$P_{2i} = B_{20} + R_{20}$$

As shown in Figure 3.2, it appears that the trajectory of CBCL internalizing problems has a negative linear time trend and positive acceleration. Moreover, having ever received an ODD diagnosis results in a higher number of internalizing problems. However, the slope of internalizing problems remains the same and there appears to be no impact of having an intellectual disability (or borderline intellectual functioning) on either the initial level of internalizing problems or change over time.

Social Problems

For the CBCL Social Problems scale, we found no significant effects of either linear or quadratic time. However, there were significant effects of status group on the intercept of social problems. Likewise, there was an effect of ODD diagnosis such that both the time-varying and “ever met” variables were significant when included in the model alone, but not when both in the model. There were no significant interactions between ODD diagnosis and status group. The final model (C) is given below. All of the fixed effect estimates and variance components are reported in Table 3.4 and Figure 3.3 depicts the final model for CBCL Social Problems over time.

$$(C) \quad \text{Level 1: } Y = P_{0i} + P_{1i}(\text{ODD Diagnosis}) + E_{ti}$$

$$\text{Level 2: } P_{0i} = B_{00} + B_{01}(\text{Borderline}) + B_{01}(\text{ID}) + R_{00}$$

$$P_{1i} = B_{10}$$

As shown in Figure 3.3, the trajectory of social problems did not change over time. However, both children with ID and those with borderline intellectual functioning demonstrated rates of social problems that were significantly higher than children with typical development. Moreover, there is a significant effect of ODD, such that children who have “ever met” criteria demonstrate higher rates of social problems and/or that meeting ODD criteria a particular time point results in higher social problems at that time. (Note that while both variables measuring ODD diagnosis were significant when in the model alone, neither were significant when both included. Accordingly, the increase in social problems can be explained EITHER by having ODD at that time point OR ever having met ODD criteria, not both).

Discussion:

Overall, it appears that children with ID and those with borderline functioning have higher rates of externalizing behavior problems and social problems than typically developing children. There were no status group differences in internalizing problems. Moreover, there appear to be no status group differences in the rate of change over time for any of the aforementioned scales. Instead, externalizing behavior problems and internalizing problems

appear to decrease over time while social problems do not change over time. Of note, the positive acceleration in rate of change for the externalizing behavior problems and internalizing problems suggests that the overall number of these problems may ultimately increase during adolescence, as the positive acceleration overrides the negative instantaneous slope.

With regard to ODD, our findings suggest that meeting criteria for ODD (“Ever Met” variable) related to an increase in externalizing behavior problems, internalizing problems and social problems. Of interest, for externalizing behavior problems both having “ever met” ODD criteria on the DISC and currently meeting ODD criteria have a significant effect, increasing the initial level of problems and the number of problems at that time point. This was not the case for internalizing problems, where only having “ever met” ODD criteria had a significant impact. Likewise, for social problems, either ODD variable but not both, was significant. For all three scales, ODD did not have a significant effect on the slope of behavior problems, suggesting that having ODD does not impact the rate of change over time.

Finally, although both ODD and status group had significant impacts on the initial level of behavior problems, there were no significant interactions between these variables for any of the aforementioned scales. This was the case for both the intercept and the slope of behavior problems over time. Accordingly, it appears that the impact of having an ODD diagnosis on behavior problems does not differ for individuals with and without ID.

Our results are somewhat consistent with the previous research and the study by de Ruiter, et al. (2007). Like their findings, we also found higher rates of all behavior problems for children with ID. Moreover, the current study included a sample of children with borderline intellectual functioning and found that these children also demonstrate significantly higher rates of behavior problems across all domains relative to typically developing peers. We also found that externalizing behavior problems appear to decrease over time for children with ID, children with borderline functioning and children with typical development. However, our findings are not consistent with previous research suggesting that children with ID experience a steeper

decrease in behavior problems relative to children with typical development. Moreover, our results are not consistent with findings by de Ruiter et al., (2007) suggesting that social problems appear to decrease over time and that internalizing problems appear to increase over time. These differences may be explained by the difference in number of time points and ages examined between the current study and that by de Ruiter et al., (2007). While their study included only three time points, our study included 5 time points and thus addressed quadratic time trends. Moreover, while the current study included children ages 5 to 9, the de Ruiter, et al. (2007) study examined children ages 6 to 18, with each participant contributing three data points across 6 years. Accordingly, the findings from that study may reflect changes between ages 9 and 18 that were not captured in this study and/or differences in the methodology.

Limitations

There are a few limitations to the present study that require consideration when interpreting the results. First, the primary measure and the measure of ODD are both mother-report measures. Accordingly, there may be some shared method variance that may account for the strong relationships between ODD diagnoses on the DISC and behavior problems on the CBCL. Ideally, either or both of these measures would represent the report of multiple informants, thereby strengthening the interpretability of relationships between ODD diagnoses and behavior problems. This was not possible in the current study as requiring multiple informants or using father or teacher-report data would have drastically reduced the already small sample size.

Another possible limitation relates to the sample size included in the study and in the ID and borderline groups in particular. Research suggests that small sample sizes, both at level 1 (time point in the current study) and level 2 (individual participants in the current study), may result in biased estimates of the variance components, particularly when the interclass correlations (proportion of variance at level 2) are large. However, the number of level 2 units is particularly important and research suggests that having at least 50 groups generally results in

unbiased estimates (Maas & Hox, 2005). Accordingly, the current study, having a total of 191 level 2 units with 5 level 1 units in each, appears more than sufficient.

Conclusions and Future Directions

Overall, our results suggest that there are substantial group differences in behavior problems between individuals with and without ID, such that children with ID and those with borderline intellectual functioning demonstrate significantly higher rates of externalizing behavior problems and social problems than do their typically developing peers. Likewise, receiving a diagnosis of ODD on the DISC appears to significantly increase the number of externalizing behavior problems and internalizing problems. Of note, however, there appear to be no interactions between either ODD or status group and the slope (or acceleration) of behavior problems from age 5-9. Instead, both ODD and status group impact only the initial level of behavior problems, not the change over time.

Perhaps more importantly, we do not find any interactions between ODD diagnosis and status group, suggesting that the impact of ODD on behavior problems does not differ between children with and without ID. This supports the hypothesis that ODD is the same disorder for children with and without ID.

Table 3.1.

Demographics by Delay Status at Child Age 5

Demographic	Typically Developing (n=115)	Borderline (n=27)	Intellectual Disability (n=49)	X ² or F Ratio (df)
Child				
Stanford Binet IQ	103.7 (11.7)	77.3 (4.0)	53.1 (10.9)	F = 397.1 (2, 188)***
Vineland Scales of Adaptive Behavior	105.2 (16.0)	76.6 (12.1)	58.0 (8.6)	F = 209.2 (2, 188)***
Gender (% Male)	62 (53.9%)	19 (70.3%)	27 (55.1%)	X ² = 2.47 (N = 191)
Race/Ethnicity (% Caucasian-non Hispanic)	72 (62.6%)	14 (51.8%)	28 (57.1%)	X ² = 1.23 (N=191)
Mother and Family				
Income \$50,000 +	73 (63.5%)	16 (59.3%)	20 (40.8%)	X ² = 7.26 (N=191)*
Mother's Years of Schooling	15.6 (2.3)	14.7 (2.1)	14.2 (1.9)	F = 8.36 (2, 188)***

(*) p < .10, * p < .05, ** p < .01, *** p < .001

Table 3.2

Impact of ODD and Status Group on CBCL Externalizing Behavior Problems Index

Fixed Effects	Model 1: Random Intercept Only	Model 2: Final Model
Predictor	Coefficient (SE)	Coefficient (SE)
Intercept, B ₀₀	0.23 (0.02)***	0.343 (0.032)***
Linear Time, B ₁₀		-0.019 (0.002)***
Quadratic Time, B ₂₀		0.0003 (0.000)***
ODD Diagnosis, B ₃₀		0.087 (0.017)***
ID, B ₀₁		0.041 (0.028)(*)
Borderline, B ₀₂		0.048 (0.035)(*)
Ever Met ODD Diagnosis, B ₀₃		0.112 (0.025)***
Variance Components		
Intercept, R ₀₀	0.04 (0.00)	0.099 (0.015)
Linear Time, R ₁₀		0.0003 (0.0001)
Quadratic Time, R ₂₀		0.0000 (0.0000)
Level 1, σ^2	0.04 (0.00)	0.018 (0.002)

(*) p < .10, * p < .05, ** p < .01, *** p < .001

Table 3.3

Impact of ODD and Status Group on CBCL Internalizing Problems Index

Fixed Effects	Model 1: Random Intercept Only	Model 2: Final Model
Predictor	Coefficient (SE)	Coefficient (SE)
Intercept, B_{00}	0.21 (0.01)***	0.188 (0.025)***
Linear Time, B_{10}		-0.005 (0.001)***
Quadratic Time, B_{20}		0.0001 (0.000)***
Ever Met ODD Diagnosis, B_{01}		0.119 (0.026)***
Variance Components		
Intercept, R_{00}	0.29 (0.00)	0.045 (0.007)
Linear Time, R_{10}		0.0001 (0.0000)
Quadratic Time, R_{20}		0.0000 (0.0000)
Level 1, σ^2	0.01 (0.00)	0.011 (0.001)

(*) $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$

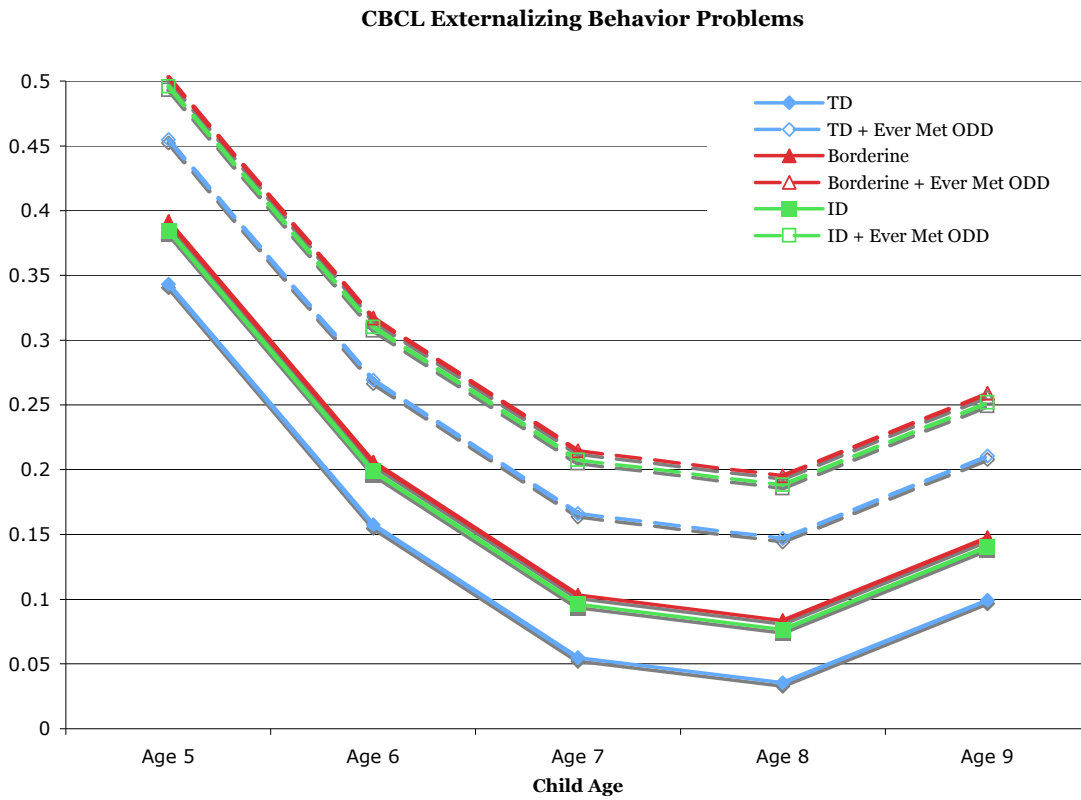
Table 3.4

Impact of ODD and Status Group on CBCL Social Problems Index

Fixed Effects	Model 1: Random Intercept Only	Model 2: Final Model
Predictor	Coefficient (SE)	Coefficient (SE)
Intercept, B_{00}	3.59 (0.25)***	2.36 (0.27)***
ODD Diagnosis, B_{30}		0.49 (0.22)*
ID, B_{01}		3.45 (0.51)***
Borderline, B_{02}		2.00 (0.63)**
Variance Components		
Intercept, R_{00}	9.29 (1.10)	6.53 (0.80)
Level 1, σ^2	2.76 (0.18)	2.80 (0.18)

(*) $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$

Figure 3.1



Note: The time-varying ODD variable is not represented in the figure, but would increase the total number of externalizing behavior problems at that given time point by 0.087.

Figure 3.2

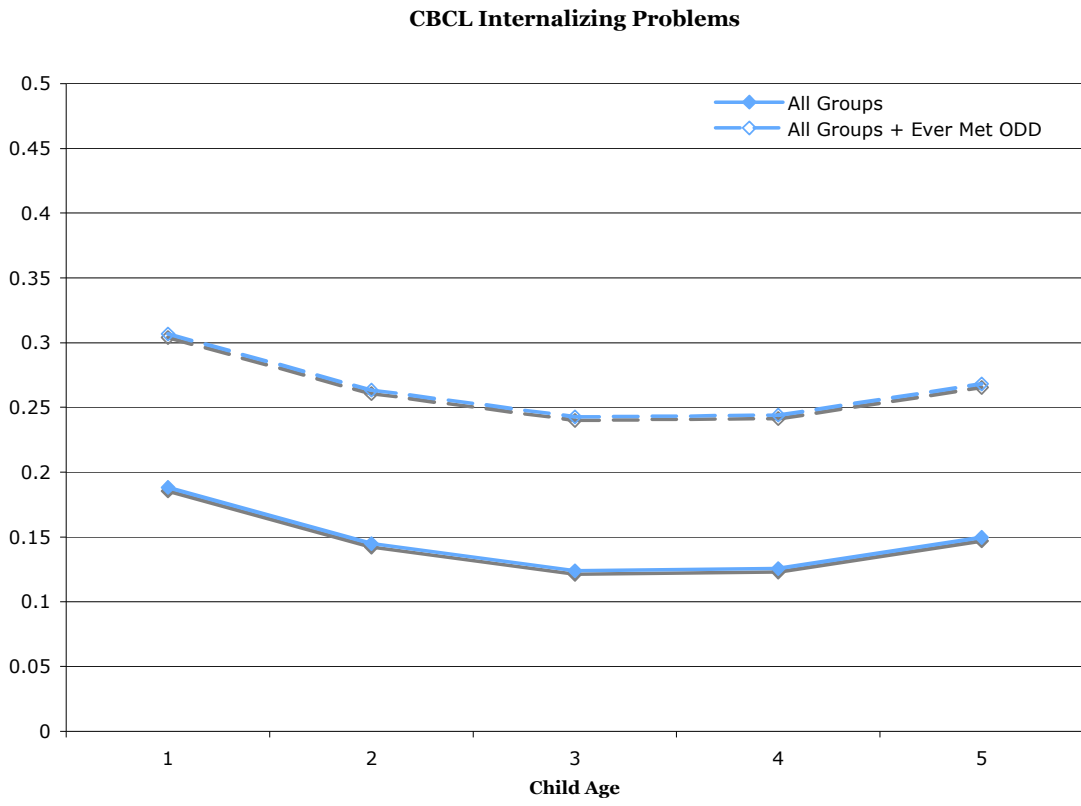
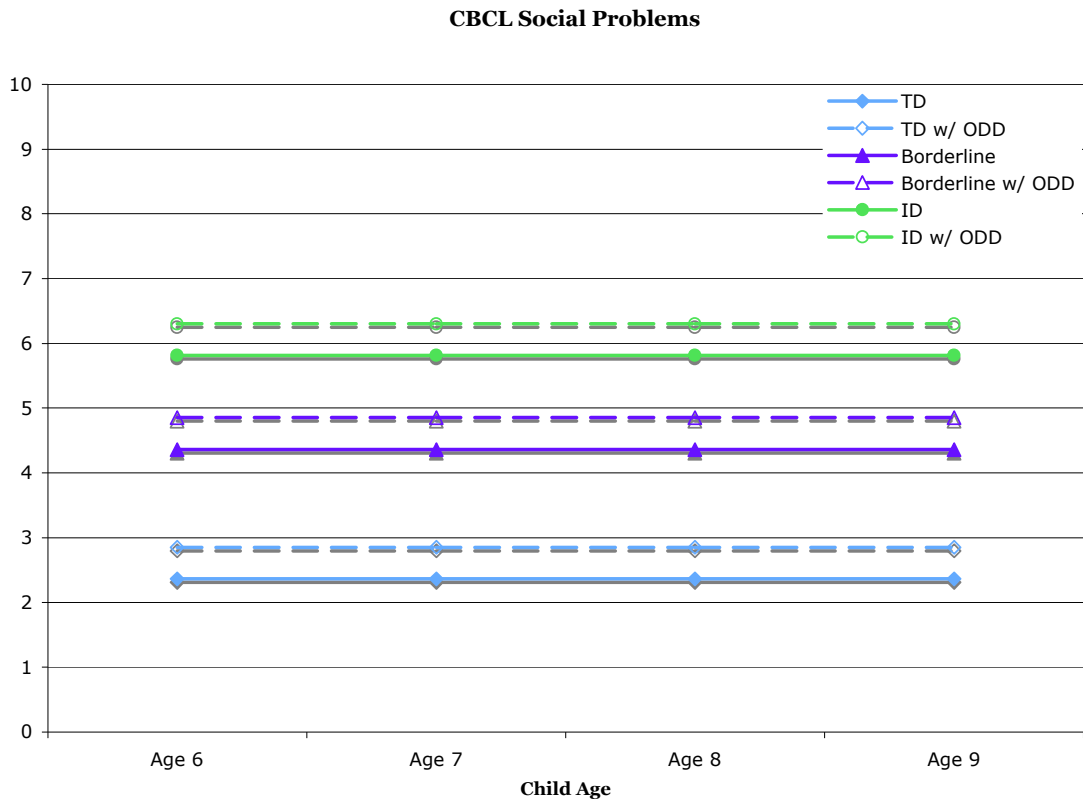


Figure 3.3



Note: For this model, both the “Ever Met” and time-varying ODD variables were significant when alone in the model. However, when both were added, neither was significant. The “Ever Met” variable is depicted above.

Chapter 7: Friendships in Early Adolescence

The fourth aim of this dissertation was to examine similarities and differences in friendships for children with ODD with and without developmental delays. To address this aim, we examined a variety of friendship characteristics to determine a) whether these relationships differ between children with developmental delays and typically developing children and b) the impact of ODD on friendship in adolescence.

Friendships in Early Adolescence

Friendships provide a source of support during adolescence as children transition from relying predominantly on their parents to seeking support from their peers (Furman & Buhrmester, 1992). As such, developing friendships represents an important step in adolescent's social development and may be indicative of their social competence (Sullivan, 1953; Hartup, 1993). Likewise, having friends in childhood and adolescence predicts better outcomes in adulthood by increasing self-worth and interpersonal competence (Buhrmester, 1996; Hartup, 1996). The positive contribution of having one or more friends appears distinct from the impact of peer acceptance/rejection (Bagwell, Newcomb & Bukowski, 1998; Parker & Asher, 1993), and having one reciprocal friendship may serve as a protective factor for children who are rejected by their peers (Rubin, et al., 2005).

Relatively little research has considered the quality of children and adolescents' friendships, focusing instead on whether children have friends and/or their overall relationships with their peers. Research on the characteristics and quality of friendships suggests that the elements emphasized in friendships change as children enter adolescence. Children tend to form friendships with same-age and same-gender friends during early and middle childhood, while adolescents develop increasing numbers of opposite-gender friends (Connolly, Furman & Konarski, 2000; Feiring, 1999; Shrum et al., 1988). Likewise, the quality of children's friendships changes as they enter adolescence. While younger children emphasize proximity, similarity, transcending contexts (i.e. spending time together in multiple situations/places) and

companionship in their friendships (Matheson, Olsen & Weisner, 2007; Aboud & Mendelson, 1996), adolescents emphasize support, conflict management, stability, trust, loyalty and intimacy (Berndt, 1989; Berndt, 1996; Bukowski, Hoza, & Boivin 1994; Parker & Asher, 1993). It is likely the emphasis on the latter characteristics of friendships that allows children to rely more on their peers for support as they enter adolescence.

Friendships of Children & Adolescents with Developmental Delays

There is considerable evidence to suggest that children with developmental delays experience more difficulties in their peer relationships and are rated as less popular than their typically developing peers (Frostad & Pijl, 2007). Accordingly, it may be particularly important for children and adolescents with developmental delays to establish friendships that will provide them with opportunities to improve social skills and buffer against poor social outcomes in adulthood.

Much of the research on friendships in children with developmental delays has utilized sociometric measures of peer relationships such as peer nominations (Webster & Carter, 2007). These measures may inaccurately represent the amount of time children with developmental delays spend with their peers and instead, may be a better gauge of overall popularity (Webster & Carter, 2007). Considerably less research has been devoted to the number of friends children with developmental delays have and the quality of these friendships.

Children with developmental delays report varying numbers of friends, with much of this variance accounted for by differences in educational settings (Heiman, 2000; Heiman, 200b). Although there is conflicting evidence about whether children in inclusive settings have more friends than those in special education schools (Webster & Carter, 2007), there is considerable support for fewer friendships and increased levels of loneliness in children with developmental delays compared to typically developing children (Heiman, 2000; Vaughn & Ebaum, 1999; Frostad & Pijl, 2007). Moreover, children with developmental delays may report friendships that do not fall under traditional standards. Heiman (2000) found that children in special

education classrooms included siblings who were often around as friends and viewed shared playtime with classmates as indicative of a close friendship.

Characteristics of Friends

Age of Friends

Research suggests that children with learning disabilities and those with developmental delays tend to select younger friends (Osman, 1982; Wiener & Sunohara, 1998; Wiener & Schneider, 2002) rather than same-aged peers. One of the foundational aspects of friendship appears to be similarity between friends (Aboud & Mendelson, 1996; Rubin, Lynch, Coplan, Rose-Krasnor, & Booth, 1994). Similarity has a different meaning for children than it does for adolescents and children often focus on similarities in demographic characteristics and interests (Hartup, 1996). Accordingly, it is somewhat intuitive that children with developmental delays would select younger peers with whom they have similar interests.

Gender of Friends

While children predominantly have same-gender friends during middle childhood, the number of opposite-gender friendships increases during adolescence (Bukowski, Guaze, Hoza & Newcomb, 1993; Eder & Hallinan, 1978; Schneider, Wiener & Murphy, 1994). Investigators suggest that the choice of same or opposite-gender friends relates closely to the activities preferred by the child and by children of his/her gender (Bukowski et al., 1993; Maccoby, 1988). As children enter adolescence, they begin to have opposite gender friends in part because of hormonal changes that accompany the onset of puberty. Girls who befriend boys during adolescence have typically experienced an early onset of puberty and are becoming interested in romantic relationships.

Research suggests that children with developmental delays do not differ from typically developing peers in the gender of their friends (Guralnick, 1997). However, much of the research to date has focused on children in early childhood before children tend to segregate into same-gender friend groups. Nevertheless, Wiener & Schneider (2002) examined the

friendships of pre-adolescents with and without learning disabilities and found no group differences in the gender of friends.

Duration of Time and Setting of Interactions

Children with developmental delays spend limited time with friends outside of school and spend less time at friends' houses than their typically developing peers (Geisthardt, Brotherson & Cook, 2002; Guralnick, 1997). Instead, interactions with peers occur predominantly during school hours (Zetlin & Murtaugh, 1988) or within the context of organized activities (Abells, Burbidge, & Minnes, 2008). While most children meet their friends at school (Weiner & Schneider, 2002), there is some evidence to suggest that children with developmental delays in self-contained classrooms within mainstream settings may meet friends at home or in the neighborhood instead (Heiman, 2000).

Play and Activities

Parten (1932) described six categories of social participation - unoccupied behavior, solitary play, onlooker behavior, parallel play (playing beside one another, but not together), associative play (plays and shares with others, but is not coordinating with them), and cooperative play (social play involving coordination and division of roles). Parten suggested that there may be some developmental sequence in which children move from solitary to cooperative play by age 5. Since this study, researchers have questioned the developmental sequence of these behaviors and the degree to which children move from one to the other and Guralnick, Hammond & Connor (2003) added the category of talking or interactive play.

Play interactions among young children with developmental delays are characterized by more solitary play and on-looking behavior and less cooperative play than typically developing peers (Hestenes & Carroll, 2000) and they may remain in parallel play for longer than their peers (Guralnick & Hammond, 1999).

Given that it is unknown how adolescents with developmental delays will engage with their peers and what the focus of their interactions will be, the author has adapted these

categories and examines them in the current study. Rather than use the categories as observed codes of interaction, the author considers the focus of the adolescent's interactions. For example, playing videogames or watching T.V. would be considered parallel play, while making a movie would be considered cooperative play.

Quality of Friendships

Children with developmental delays rarely form reciprocal friendships (Guralnick, Gottman & Hammond, 1996; Guralnick & Groom, 1988). Likewise, the quality of their friendships may differ from typically developing children. However, relatively little research has examined the quality of friendships of children and adolescents with developmental delays and their beliefs about friendship. Heiman (2000) examined 121 adolescents with mild intellectual delays in special education schools, 189 adolescents with mild intellectual delays in self-contained mainstream classrooms and 265 typically developing adolescents. All of the participants were between the ages of 12-15. When asked to identify the characteristics of a "good friend," many of the adolescents with ID failed to identify intimacy or other emotional aspects as important to a close friendship. As opposed to typically developing adolescents who included friends in secrets and expected loyalty and intimacy, adolescents with ID emphasized friends as being entertaining and helpful (particularly at school).

Matheson, Olsen & Weiser (2007) interviewed 27 adolescents with developmental delays in semi-structured format. The authors coded the interviews for 11 domains of friendship drawn from the literature on typically developing children – similarity, proximity, transcending context, companionship, reciprocity, mutuality, help/support, conflict management, stability, trust/loyalty, intimacy/disclosure (Berndt & Perry, 1986; Bukowski, Newcomb & Hartup, 1996). The authors found that companionship was the most frequently discussed theme, although transcending context, similarity, proximity and stability were also popular themes. On the other hand, intimacy/disclosure, support, reciprocity, conflict management and trust/loyalty were less frequently discussed. Turnbull, Blue-Banning & Pererira (2000) also found evidence for

companionship as a primary theme in the interviews of friends of children and adolescents with developmental delays, with instrumental and emotional support mentioned less frequently. Accordingly, it appears that adolescents with developmental delays appear to emphasize domains of friendship typically associated with younger children.

The Role of Parents

Parents play a critical role in the friendships of children with developmental delays and research suggests that parents may be considerably more involved in the interactions between their children and their children's friends than parents of typically developing children (Guralnick, 1997; Turnbull, Pereira & Blue-Banning, 1999). Turnbull, Pereira & Blue-Banning (1999) examined the friendships of 11 youths with a range of disabilities and found that parents reported using a variety of facilitation strategies to increase the target child's friendship network. Interestingly, mothers of children without disabilities often had a major role in the friendships of children with disabilities, often because they had a career in a related field. This is particularly noteworthy given evidence that mothers of typically developing children appear to arrange more playdates for their children than mothers of children with developmental delays (Guralnick, 1997).

It is interesting to consider the role that parents may play in the friendships of adolescents with developmental delays, especially given that much of the research has focused on children. Adolescence is a time of increasing autonomy and many young adolescents may independently arrange meetings with friends, consulting with parents for transportation only. Likewise, parents may no longer need to monitor the interactions of their children and his/her friends, relying on them to solve disputes, etc. Adolescents with developmental delays may not have the same skills and parents may need to continue to play an integral role in arranging and monitoring interactions with friends.

Friendships of Children with Oppositional Defiant Problems

Research has identified a robust link between aggression and peer rejection. Children exhibiting disruptive and aggressive behaviors are at increased risk for peer rejection (Coie, Dodge, Terry & Wright, 1991; Coie & Dodge, 1998; Dodge, 1983; Newcomb, Bukowski & Pattee, 1993; Rubin, Bukowski, & Parker, 1998), and approximately 50% of aggressive children are rejected by their peers (Coie et al., 1991). Other behavior problems may also lead to rejection by peers. French and Waas (1985) found that behavior problems as measured by the Child Behavior Checklist (Achenback & Edelbrock, 1983) were higher among rejected children as compared to neglected and popular children.

Children with aggressive and externalizing behaviors have friends and many have a reciprocal best friendship (Vitaro, Brendgen & Temblay, 2000). However, these children tend to form friendships with other aggressive or disruptive children (Dishion, Andrews, & Crosby, 1995; Dishion, Eddy, Haas, Li, & Spracklen, 1997) and as a result, they may have less stable and more conflictual friendships.

While there is evidence for higher rates of rejection and more conflict with friends for children with aggressive behavior, we do not know of any research that addresses the characteristics of friendships for children with Oppositional Defiant Disorder. While children with ODD by definition behave in defiant ways, their misbehavior may be directed primarily at teachers, parents and other adults. As such, while it is possible that children with ODD may be rejected in a manner similar to children exhibiting aggressive behavior, it is also possible that children with ODD do not differ from typical peers in the quality of their friendships.

Friendships of Children with Oppositional Defiant Problems and Developmental Delays

Given the increased risk of peer rejection and poorer friendships associated with having a developmental delay and the risks associated with behavior problems, research is needed to examine the friendships of adolescents with dual diagnoses. There is some evidence to indicate that the relationship between behavior problems and peer rejection may be attenuated in

adolescents with ID. Laws, Taylor, Benny and Buckley (1996) examined the relationship between peer rejection via sociometric nominations and level of behavior problems in 16 children with Down syndrome and 122 typically developing children between the ages of 8 and 11. Although the number of behavior problems was higher in the Down syndrome group, there was a weaker relationship between behavior problems and rejection than seen in the typically developing children. This finding may be the result of the physical characteristics associated with Down Syndrome, the subsequent awareness of their disability status, and acceptance of associated behavior problems. Peers of children with ID who are not easily identified as having a disability may be more likely to be rejected as a result of their higher rates of behavior problems. Accordingly, further research is needed to examine the impact of dual diagnosis on friendships and peer relationships in adolescents with developmental delays.

Hypotheses & Rational for the Current Study

The current study addresses three questions. First, how do the friendships of young adolescents with and without developmental delays differ? Second, does Oppositional Defiant Disorder (ODD) impact the friendships of youth with and without developmental delays? Third, does this impact differ across status groups? Hypotheses for each of these questions are delineated below.

Question 5: How do the friendships of adolescents with and without developmental delays differ?

Hypotheses:

- *5a. Fewer adolescents with developmental delays will have a best friend(s) than typically developing adolescents. .*
- *5b. Friends of adolescents with developmental delays will be younger on average than the friends of typically developing peers.*

- *5c. Adolescents with developmental delays will not differ from typically developing adolescents with regard to the gender of their friends. Both adolescents with and without developmental delays will have predominantly same-gender friends.*
- *5d. Adolescents with developmental delays will spend less time with friends than typically developing adolescents.*
- *5e. Fewer adolescents with developmental delays will engage in interactive play than typically developing adolescents.*
- *5f. Adolescents with developmental delays will have friendships that are rated less warm/close and more conflictual than the friendships of typically developing adolescents.*
- *5g. Friendships of adolescents with developmental delays will be rated as less reciprocal than friendships of typically developing adolescents.*
- *5h. Parents of adolescents with developmental delays will be more involved in arranging interactions (e.g. playdates) between their children and their children's friends than parents of typically developing adolescents.*

Question 6 and 7: What is the impact of Oppositional Defiant Disorder on these friendships, and does this impact differ across status groups?

- *6a. Adolescents with ODD will not differ from adolescents without ODD with regard to the number of friends they have and whether they have a best friend.*
- *6b. Adolescents with ODD will have more conflictual relationships with friends.*

No further hypotheses are specified with regard to the friendships of children with ODD or the differential impact of ODD on the friendships of children with and without delays. However, the impact of ODD and the interaction between ODD and developmental delay will be addressed for the same domains discussed in Question #5.

Brief Method:

Participants

The data reported in this aim of the study are from the 101 of the original 238 families (TD n= 78; DD n=23) who met inclusion criteria, i.e. those who completed the age 13 assessment as well as the age 5 assessment and at least 2 of the 4 assessments between child ages 6 and 9.

The children were classified based on scores on the SB-IV and VABS at child age 5, the first year considered in the present study. The children and their families were then followed through age 13, with visits at age 6, 7, 8, 9, and 13. The Wechsler Intelligence Scale for Children (WISC-IV) and VABS were administered at ages 9 and 13 to confirm status grouping.⁶ Due to the small sample size, we combined the children with borderline intellectual functioning and those with intellectual disabilities into one group (termed Developmental Delays, DD).

Table 4.1 shows demographic characteristics at child age 13 by developmental status group (TD and DD). Child gender was not associated with status group and roughly 50% of the participants in each group were male. However, race/ethnicity did differ across the groups, with a higher percentage of Caucasians in the TD group than the DD group. Family income and mothers' education were also significantly related to group status. The TD group had more families with an annual income of \$50,000 or higher than the DD group, and mothers in the TD group completed significantly more years of school than mothers in the DD group. These covariates were not included in the analyses due to concerns about further reducing cell sizes.

⁶ A majority of participants received scores that were consistent with their prior classification at ages 9 and 13. Eight participants had scores at age 13 that placed them in a different group than previously. Three participants had IQs that fell from the typically developing range of 85 and above to just below this criteria (e.g. IQ between 80-84). These participants were kept in the typically developing group as all their previous scores were well within the average range and their VABS continued to be significantly above 85. Three participants had VABS scores that were slightly above 85 at age 13. However, these participants had consistently met criteria for ID and/or borderline intellectual functioning at previous time points and continued to have IQ scores in the ID and/or borderline intellectual functioning range. Accordingly, their classification in the ID group was maintained. One participant appeared to move from the ID range at age 3 and 5 to the TD range at age 9 and 13. Given the consistency in scores at the latter ages, this transition was considered accurate and this participant was classified as TD for this study. Finally, one participant was dropped as a result of inconsistent scores across time.

Measures

With the exception of the measures used to determine status group, the primary measures for this aim were the semistructured parent and adolescent interviews and the Diagnostic Interview Schedule for Children (DISC).

Results:

To address the differences in friendship characteristics by status group and the presence of ODD, logistic regressions were conducted in SPSS version 18. The analyses were run with both variables and an interaction term (to address the question of whether the impact of ODD differs for adolescents with and without developmental delays). Given the lack of significant interactions and to make the findings more interpretable, however, the findings for the main effects (of status group and ODD diagnosis) are presented as separate chi-square analyses in Table 4.2.

Friendships of Adolescents with and without DD

Age of Friends

To examine group differences in the age of friends, the codes from the interview were dichotomized into “Primarily Younger” and “Same Age or Older.” Chi-square analyses⁷ were then used to examine differences in age of friends by status group. According to both adolescent and parent report, there were no significant group differences in age of friends.

Gender of Friends

To examine group differences in the gender of friends, the codes from the interview were dichotomized into “Primarily Same Gender” and “Opposite/Mixed Gender.” Chi-square tests were then used to examine differences in gender of friends by status group. According to both adolescent and parent report, there were significant group differences in gender of friends such that a higher percentage of adolescents with DD had opposite gender friends.

Best Friend

⁷ Fisher’s exact correction was used as necessary to account for low expected cell counts.

Chi-square tests were then used to examine differences in the presence of a best friend by status group. Using adolescent report data, there were no significant group differences in the presence of a best friend and the vast majority of children in both groups reported that they had a best friend. Parents reported significant group differences in the presence of a best friend, however. Only 50% of adolescents with DD were reported to have a best friend compared to a majority of TD adolescents.

Time with Friends Outside of School

To examine group differences in the amount of time adolescents spend with friends outside of school, we created a dichotomous code of “None” vs. “At least monthly” time with friends outside of school. Chi-square analyses were then used to examine status group differences with friends outside of school. According to both adolescent and parent report, there were significant group differences in time with friends outside of school, such that a higher percentage of TD adolescents met with friends outside of school monthly (or more frequently) than adolescents with ID.

Cohesive Group of Friends

To examine group differences in the structure or composition of friends, we created a dichotomous code of “Compartmentalized/Separate Friendships” vs. “Cohesive group of Friends.” Chi-square analyses were then used to examine group differences in the composition of friends. According to adolescent report, there were significant group differences in the composition for friends, such that a higher percentage of TD adolescents had a cohesive group of friends than adolescents with DD. Using parent report data, the same pattern emerged, but was non-significant.

Level of Interaction During Activities

To examine whether or not adolescents with DD engage with their friends differently than TD adolescents, we created a code addressing four different levels of interaction during activities with friends – parallel, associative, cooperative, and interactive. These four levels of

interaction were then dichotomized into “Interactive” vs. “Other.” Chi-square analyses were conducted to examine status group differences in level of interaction. According to both adolescent and parent report, there were no significant group differences in level of interaction with friends.

Quality of Friendship

Three codes addressing warmth/closeness, positive reciprocity and conflict were used to examine differences in the quality of friendships of adolescents with and without DD. Each of these codes was initially scored on a likert scale where 0= None or very little, 1= minimal, 2= moderate, 3= very/a lot and 4= predominantly. These codes were then dichotomized into none/low vs. moderate to high and chi-square analyses were conducted. Results suggest significant status group differences, such that fewer adolescents with DD have friendships characterized by at least moderate warmth closeness according to both adolescent and parent report. There were also significant group differences in positive reciprocity, such that fewer adolescents with DD have friendships characterized by at least moderate positive reciprocity according to both adolescent and parent report. There were no significant group differences in levels of conflict with friends according to parent report. However, using adolescent report data, findings suggest that fewer adolescents with DD have any conflict with friends.

Parent Involvement in Organizing Activities

To examine whether or not adolescents with DD differ from their typically developing peers with regard to who organizes activities, we created a code for who initiates play dates/interactions between the adolescent and his/her friends – the adolescent, the parent, a combination or the adolescent only sees friends during organized activities such as sports. This code was dichotomized into the adolescent as the primary initiator vs. all other scenarios (e.g. parent as primary initiator, combinatory or organized activities only). Chi-square analyses were conducted to examine status group differences in level of interaction. According to both

adolescent and parent report, there were no significant group differences in who initiates activities.

Friendships of Adolescents with and without Oppositional Defiant Disorder

In order to examine group differences in characteristics of friendships for adolescents with and without ODD, chi-square analyses were conducted on all of the aforementioned codes. Two different variables were used to capture ODD diagnosis: one variable capturing those participants who “ever met” criteria for ODD on the DISC between ages 5-9 (shown in Table 4.3) and another variable capturing concurrent diagnoses of ODD on the DISC at age 13. With one exception, there were no group differences in any of the friendship codes for either of the ODD variables using either parent or adolescent report. The one exception was a significant difference in who initiates activities using parent report data, such that adolescents with a concurrent diagnosis of ODD were less likely to organize activities on their own ($\chi^2 = 6.61, p = 0.03$). Given the number of analyses conducted, however, this finding must be interpreted with caution.

Examining logistic regression analyses with main effects for ODD, status group and an interaction between the two, we find no interactions between status group and ODD diagnosis (prior or concurrent diagnoses), with two exceptions. Using parent report data, there is an interaction between prior ODD diagnosis and status group on level of interaction and who initiates activities. Adolescents with typical development and without a prior ODD diagnosis are even more likely to engage in interactive play with peers and initiate activities on their own. Given the number of analyses conducted, however, these results must be interpreted with caution.

Discussion:

Overall, findings from both parent and adolescent interviews suggest that adolescents with DD have friendships that differ substantially from those of their typically developing peers. Although most adolescents with DD have same-age friends, they appear more likely to have opposite gender friends. Furthermore, it appears that fewer adolescents with DD have a best

friend (according to parent report only) or a cohesive group of friends. Moreover, significantly fewer adolescents with DD spend time with friends outside of school than typically developing adolescents. Finally, adolescents with DD appear to have friendships characterized by less warmth/closeness and less positive reciprocity than their typically developing peers. According to adolescent report only, there also appear to be differences in the amount of conflict with adolescents with DD reporting less conflict with friends than TD adolescents.

These findings appear largely consistent with prior findings suggesting that adolescents with disabilities have qualitatively different friendships than typically developing adolescents. With regard to the age and gender of friends, however, our findings are inconsistent with previous literature, which suggests that adolescents with disabilities tend to have younger friends and friends of the same gender (while typically developing peers develop friendships with the opposite sex). Our contrary findings with regard to age of friends may relate to the way in which this question was addressed in the current study. Our coding system focused on the average age of the adolescent's friends and given that most adolescents and parents did not know the exact birthdays of their friends, differences in age were operationalized in years as opposed to months. This approach may have missed important but smaller differences in the age of the adolescent's friends. Likewise, it is possible that while a majority of an adolescent's friends are his/her same age, his/her best friend could be significantly younger.

With regard to gender of friends, our discrepant findings may relate to the age of our sample. As all of our participants were just beginning adolescence, few may have begun the process of befriending individuals of the opposite sex as is typical of later adolescence. Instead, the greater number of adolescents with DD who reported primarily having friends of the opposite sex may reflect a delay in the gender separation typical of middle childhood. Unlike their TD peers, adolescents with DD may have not yet divided into single gender groups and may continue to engage with peers of the opposite sex.

With regard to time spent with friends and the quality of friendship, our findings were consistent with our hypotheses and with the previous literature. Adolescents with DD appear to spend less time with friends outside of school and their friendships are rated less warm/close and less positively reciprocal. Furthermore, it appears that significantly fewer adolescents with DD have a best friend than typically developing adolescents. Of note, this latter finding is only true for parent report data and it appears that adolescents with DD report having a best friend even when their parents do not describe such a relationship. Likewise, findings suggest a significant differences in conflict with friends according to adolescent report data, such that fewer adolescents with DD have any conflict with friends. Although this may be the case, the discrepancy between adolescent and parent report on this variable suggests that adolescents with DD may deny conflict with friends even though they demonstrate the same level of conflict as TD peers.

When the impact of Oppositional Defiant Disorder is examined, there is no impact of ODD on any of the friendship variables examined. This is the case for both prior diagnoses of ODD on the DISC and concurrent diagnoses, with one exception. There is a significant relationship between ODD diagnosis at age 13 and who initiates activities according to parent report; it appears that parents are more likely to initiate activities for adolescents with ODD than adolescents without an ODD diagnosis. This result may reflect the need for parents to step in when adolescents are rejected by peers as a result of externalizing behavior. However, given the number of analyses conducted, this finding must be interpreted with caution and may not be a meaningful result. Moreover, there appear to be no significant interactions between status group and ODD diagnosis, with two possible exceptions. Accordingly, our results support the similarity between the impact of ODD on friendships for adolescents with and without intellectual disabilities.

Limitations

There are a few limitations to the present study that require consideration when interpreting the results. One limitation of this study is the small sample size, particularly in the DD group. This limitation is particularly important with regard to the adolescent report data as some of the adolescents included in the study were unable to complete the interview, leaving only parent report data. Nonetheless, the consistency between findings using adolescent and parent report data suggests that our findings are meaningful in spite of the small sample sizes.

Another limitation relates to the self-report nature of the data, which may be impacted by reporter biases related to social desirability and/or limitations in recall. Moreover, this study did not include sociometric or observational measures of friendships and thus, cannot fully address whether friendships are reciprocated by the identified peers. Accordingly, the accuracy of the parent and adolescent reports cannot be assessed.

Conclusions and Future Directions

Overall, our results suggest that adolescents with intellectual disabilities demonstrate qualitatively different friendships than their typically developing peers. However, having a diagnosis of ODD appears to have no impact on friendship, with the possible exception of who initiates activities. Of particular importance, however, is the lack of interaction between status and ODD. By and large, it appears that these two variables do not interact and thus, that the impact of having ODD on friendships does not differ for adolescents with and without intellectual disabilities. Accordingly, the current study provides evidence that ODD is the same disorder for adolescents with and without DD.

Given the considerable differences between adolescents with and without DD on measures of friendship, future research should consider contributors to these differences. Research on intellectual disabilities has examined the role of social skills and behavior problems in explaining the impact of having an intellectual disability on parenting stress, school

adjustment, etc. (Baker et al., 2002; Neece et al., 2012) and it is possible that these variables may explain differences in friendship quality and thus, provide a target for intervention.

Table 4.1.

Demographics by Delay Status at Child Age 13

Demographic	Typically Developing (n=78)	Intellectual Disability (n=23)	X ² or t(df)
Child			
WISC-IV IQ	109.5 (12.2)	60.5 (13.7=4)	t = 15.64 (95)***
Vineland Scales of Adaptive Behavior	95.1 (9.1)	71.9 (13.8)	t = 8.56 (85)***
Gender (% Male)	44 (56.4%)	10 (47.6%)	X ² = 0.52 (N = 99)
Race/Ethnicity (% Caucasian-non Hispanic)	50 (64.1%)	9 (39.1%)	X ² = 4.56 (N=101)*
Mother and Family			
Income \$50,000 +	62 (79.5%)	12 (57.1%)	X ² = 4.38 (N=99)*
Mother's Years of Schooling	16.0 (2.4)	14.2 (2.2)	t = 3.14 (95)**

(*) p < .10, * p < .05, ** p < .01, *** p < .001

Table 4.2.

Quality of Friendship by Status Group

	Typically Developing (n=78)	Intellectual Disability (n=23)	X ² or t(df)
Adolescent Report			
Age of Friends (% Same Age/Older)	100%	91.7%	X ² = 6.32 (N = 87)
Gender of Friends (% Same Gender)	79.5%	39.1%	X ² = 13.86 (N = 101)***
Best Friend (% w/ a Best Friend)	80.5%	92.8%	X ² = 1.24 (N = 91)
Time With Friends (% At least 1x/mo)	88.0%	53.8%	X ² = 9.14 (N = 88)**
Group Composition (% w/ Group)	70.7%	30.7%	X ² = 7.53 (N = 78)*
Level of Interaction (% Interactive)	61.8%	53.3%	X ² = 0.38 (N = 91)
Initiates Activities (% Child)	81.8%	63.6%	X ² = 1.96 (N = 88)
Warmth/Closeness (% At Least Moderate)	92.3%	73.3%	X ² = 4.72 (N = 93)*
Positive Reciprocity (% At Least Moderate)	94.6%	53.3%	X ² = 19.60 (N = 89)***
Conflict (% None)	53.8%	85.7%	X ² = 4.97 (N = 92)*
Parent Report			
Age of Friends (% Same Age/Older)	93.2%	86.9%	X ² = 0.83 (N = 82)
Gender of Friends (% Same Gender)	81.4%	43.5%	X ² = 11.47 (N = 82)***
Best Friend (% w/ a Best Friend)	86.4%	52.2%	X ² = 10.92 (N = 82)**
Time With Friends (% At least 1x/mo)	96.6%	66.7%	X ² = 13.91 (N = 80)***
Group Composition (% w/ Group)	76.8%	56.3%	X ² = 2.62 (N = 72)

Level of Interaction (% Interactive)	31 (53.4%)	7 (33.3%)	$X^2 = 2.50$ (N = 79)
Initiates Activities (% Child)	45 (78.9%)	14 (60.9%)	$X^2 = 2.77$ (N = 80)(*)
Warmth/Closeness (% At Least Moderate)	57 (98.3%)	16 (69.6%)	$X^2 = 15.25$ (N = 81)***
Positive Reciprocity (% At Least Moderate)	57 (98.3%)	17 (77.3%)	$X^2 = 10.14$ (N = 89)**
Conflict (% None)	31 (54.4%)	10 (50.0%)	$X^2 = 0.11$ (N = 77)

(*) $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$

Note: As a result of missing data, the N's differ by each analysis and thus, the N's reported in the chi-square results may not add up to the full sample.

Table 4.3.

Quality of Friendship by ODD Diagnosis

	No ODD Diagnosis (n=52)	ODD Diagnosis (n=50)	X ² or t(df)
Adolescent Report			
Age of Friends (% Same Age/Older)	97.9%	100%	X ² = 0.95 (N = 93)
Gender of Friends (% Same Gender)	74.5%	63.9%	X ² = 1.52 (N = 96)
Best Friend (% w/ a Best Friend)	86.5%	82.0%	X ² = 0.40 (N = 102)
Time With Friends (% At least 1x/mo)	80.0%	79.2%	X ² = 0.10 (N = 98)
Group Composition (% w/ Group)	60.0%	67.4%	X ² = 0.53 (N = 88)
Level of Interaction (% Interactive)	62.0%	61.2%	X ² = 0.01 (N = 99)
Initiates Activities (% Child)	80.9%	76.1%	X ² = 0.31 (N = 93)
Warmth/Closeness (% At Least Moderate)	86.5%	90.0%	X ² = 0.29 (N = 102)
Positive Reciprocity (% At Least Moderate)	89.8%	82.6%	X ² = 1.04 (N = 95)
Conflict (% None)	59.6%	58.3%	X ² = 0.02 (N = 100)
Parent Report			
Age of Friends (% Same Age/Older)	93.4%	87.7%	X ² = 0.91 (N = 95)
Gender of Friends (% Same Gender)	78.2%	66.0%	X ² = 1.78 (N = 96)
Best Friend (% w/ a Best Friend)	77.8%	78.0%	X ² = 0.001 (N = 95)
Time With Friends (% At least 1x/mo)	91.3%	83.3%	X ² = 1.34 (N = 94)
Group Composition (% w/ Group)	69.0%	72.5%	X ² = 0.10 (N = 85)

Level of Interaction (% Interactive)	47.8%	42.5%	$X^2 = 0.26$ (N = 93)
Initiates Activities (% Child)	76.1%	68.1%	$X^2 = 0.74$ (N = 93)
Warmth/Closeness (% At Least Moderate)	88.9%	88.0%	$X^2 = 0.02$ (N = 95)
Positive Reciprocity (% At Least Moderate)	95.5%	87.8%	$X^2 = 1.83$ (N = 89)*
Conflict (% None)	59.5%	52.2%	$X^2 = 0.48$ (N = 88)

(*) $p < .10$, * $p < .05$, ** $p < .01$, *** $p < .001$

Note: As a result of missing data, the N's differ by each analysis and thus, the N's reported in the chi-square results may not add up to the full sample.

Chapter 8: Risk-Taking and Delinquent Behaviors in Pre-Adolescence

The fifth aim of this dissertation was to examine similarities and differences in risk-taking and delinquent behaviors for adolescents with ODD with and without developmental delays. To address this aim, we examine a scores from a self-report survey of risk-taking, delinquent, and antisocial behaviors to determine a) whether these behaviors differ between children with developmental delays and typically developing children and b) the impact of ODD on risk-taking in adolescence.

Risk-Taking and Delinquency in Adolescence

In the process of developing autonomy from their parents and establishing a separate identity for themselves, adolescents may engage in some degree of experimentation with substances and other risky behaviors (Ellickson, Collins, Hambarsoomians & McCaffrey, 2005; Jessor, 1987; Shedler & Block, 1990;). While some children only experiment with occasional risky behaviors, others may develop conduct disorder (CD) or be declared a juvenile delinquent. As defined in the DSM-IV, a person must engage in at least 3 of 15 specific antisocial behaviors within a year to be diagnosed with CD. A juvenile delinquent (a legal term), on the other hand, may be labeled as such based on engaging in at least one illegal act.

Children who engage in risky and/or delinquent behaviors during adolescence are at risk for a variety of negative outcomes ranging from fines to serious consequences such as incarceration and death (Moffitt, Caspi, Rutter & Silva, 2001; Loeber & Stouthamer-Loeber, 1998). Accordingly, engaging in delinquent and risk-taking behavior during adolescence is a particular area of concern for researchers, parents, and law enforcement. As a result, there has been considerable research devoted to risk-taking and delinquent behaviors in adolescence, with particular attention paid to substance use, cigarette use, and risky sexual behavior.

Association with Delinquent Peers

Research suggests that rejection from normative peers may lead adolescents to associate with deviant peer groups who expose them to delinquent behaviors and encourage their

participation (Deater-Deckard, 2001, Rubin et al., 1998; Vitaro, Tremblay & Bukowski, 2001). At the same time, children who experience peer rejection and also fail to maintain at least one close relationship may be at reduced risk for delinquent and risky behaviors because they are not encouraged by their peers to engage in such acts. Regardless it appears that peer relationships are an important component of delinquency, and the role of friends and peer pressure in these behaviors is well-documented.

Risk-Taking for Children with Oppositional Defiant Disorder

There appears to be significant overlap between externalizing behavior problems and delinquent and risk-taking behaviors. Children and adolescents with disruptive behavior disorders appear to initiate antisocial behaviors earlier (Lillehoj, Trudeau, Spoth & Madon, 2005), and there is considerable research suggesting that aggression and noncompliance during childhood is a significant predictor of delinquency in adolescence (Caspi & Moffit, 1995; Loeber, 1982; Sampson & Laub, 1993). Moreover, oppositional defiant disorder (ODD) is often viewed as a developmental precursor to conduct disorder, and 90% of children with conduct disorder met criteria for ODD previously (Lahey, et al., 1994; Loeber, et al., 1993). In this light, it is important to consider what risk-taking and delinquent behaviors children with ODD might engage in.

Risk-Taking for Children with Developmental Delays

Research finds considerable support for differences in cognitive functioning between children with and without significant conduct problems (Elkins, et al., 1997; Fergusson et al., 2005; Ge et al., 2001; Kratzer & Hodgins, 1999; Lynam et al., 1993; Moffitt & Silva, 1988). Recent research suggests that youth who commit antisocial and delinquent behaviors may have mean IQs a full standard deviation below average (Lynam & Henry, 2001). Moreover, investigators have identified executive functioning and verbal reasoning as two areas of interest that may characterize the neuropsychological profiles of early-onset antisocial behaviors.

Relatively less research has been devoted to the study of individuals with ID who engage in risk-taking and delinquent behaviors, although there is some literature indicating that a significant portion of the prison population may have intellectual disabilities (Murphy, Harnett & Holland, 1995; Hayes, Shackell, Mottram & Lancaster, 2007). Moreover, there is some research suggesting that children and adolescents with DD demonstrate higher rates of antisocial behaviors (Dickson, Emerson & Hatton, 2005; Frison, Wallander & Browne, 1998). Much of this research has utilized official statistics (Coleman & Hendry, 1999), which likely under-represent the prevalence of antisocial behaviors (Dickson et al, 2005). Dickson et al., (2005) used interviews to obtain self-reported antisocial behaviors from 98 11-15 year olds with ID (and a comparison sample of TD adolescents). Findings illustrate the higher rate of antisocial behavior in this population relative to typically developing peers. Moreover, the authors found that antisocial behavior was associated with male gender, older age, lower levels of maternal education, living in poverty, family dysfunction and having a comorbid mental health disorder. Of note, Dickson et al., only examined antisocial behaviors such as truancy, breaking-and-entering, etc. Moreover, the authors used a fairly inclusive definition of ID, including adolescents reported to having ‘learning difficulties’ and whose parents had concerns about their language development. The current study expands upon previous research by examining other risk-taking and delinquent behaviors, by clearly defining ID and by examining children with borderline intellectual functioning.

Hypotheses and Rationale for the Current Study

This section of the current study addresses three questions - (1) whether youth with intellectual disabilities and/or borderline intellectual functioning differ from typically developing youth on measures of risk-taking and delinquency, (2) whether having a comorbid diagnosis of ODD increases the level of risk-taking and delinquency, and (3) whether the impact of a diagnosis of ODD on these behaviors changes by status group.

The current study expands on previous research by considering other types of delinquent and risk-taking behaviors that adolescents may engage in. In particular, we examine typical rule-breaking behaviors to see if these also differ by status group and the presence of comorbid ODD. The current study builds on previous research by examining two factors that confer a significant risk for risky and delinquent behaviors – having a developmental delay and having an ODD.

Question 8: Do adolescents with developmental delays differ from typically-developing adolescents on measures of risk-taking and delinquency?

Hypotheses:

- *8a. It is expected that adolescents with DD will endorse more risk-taking behaviors than typically developing adolescents.*

Question 9 and 10: Does having Oppositional Defiant Disorder impact the level of engagement in risk-taking and delinquent behaviors and does this impact differ by status group?

- *9a. It is expected that adolescents with ODD will endorse more risk taking behaviors than adolescents without ODD and that that adolescents with ODD and DD will endorse the most risk-taking behaviors.*

No hypotheses are specified regarding status group differences in the impact of ODD on risk-taking and delinquent behaviors.

Brief Method:

Participants

The data reported in this aim of the study are from the 101 of the original 238 families (TD n= 78; DD n=23) who met inclusion criteria, i.e. those who completed the age 13 assessment as well as the age 5 assessment and at least 2 of the 4 assessments between child ages 6 and 9.

The children were classified based on scores on the SB-IV and VABS at child age 5, the first year considered in the present study. The children and their families were then followed

through age 13, with visits at age 6, 7, 8, 9, 12 and 13. The Wechsler Intelligence Scale for Children (WISC-IV) and VABS were administered at ages 9 and 13 to confirm status grouping.⁸ Due to the small sample size, we combined the children with borderline intellectual functioning and those with intellectual disabilities into one group (termed Developmental Delays, DD).

Table 5.1 shows demographic characteristics at child age 13 by developmental status group (TD and DD). Child gender was not associated with status group and approximately 50% of the participants in each group were male. However, race/ethnicity did differ across the groups, with a higher percentage of Caucasians in the TD group than the DD group. Family income and mothers' education were also significantly related to group status. The TD group had more families with an annual income of \$50,000 or higher than the DD group, and mothers in the TD group completed significantly more years of school than mothers in the DD group. None of these socioeconomic variables related significantly to the dependent variables. Accordingly, the demographic variables were not covaried in any analysis.

Measures

In addition to the measures used to classify the participants, the primary instruments used for this aim were the Diagnostic Interview Schedule for Children (DISC) and the Adolescent Risk-Taking and Delinquency Questionnaire.

Data Preparation:

Prior to analyzing the questions of interest, the Adolescent Risk-Taking and Delinquency questionnaire was divided into a number of subscales. Exploratory factor analyses were then

⁸ A majority of participants received scores that were consistent with their prior classification at ages 9 and 13. Eight participants had scores at age 13 that placed them in a different group than previously. Three participants had IQs that fell from the typically developing range of 85 and above to just below this criteria (e.g. IQ between 80-84). These participants were kept in the typically developing group as all their previous scores were well within the average range and their VABS continued to be significantly above 85. Three participants had VABS scores that were slightly above 85 at age 13. However, these participants had consistently met criteria for ID and/or borderline intellectual functioning at previous time points and continued to have IQ scores in the ID and/or borderline intellectual functioning range. Accordingly, their classification in the ID group was maintained. One participant appeared to move from the ID range at age 3 and 5 to the TD range at age 9 and 13. Given the consistency in scores at the latter ages, this transition was considered accurate and this participant was classified as TD for this study. Finally, one participant was dropped as a result of inconsistent scores across time.

conducted in SPSS Version 18 and the writer examined the solutions for 3, 4, 5 and 6 factors. A principal axis factoring with varimax rotation was used for each of the analyses.

Examining the results in combination with a priori subscales⁹ suggests a final division of the full scale into 3 factors. These final factors/subscales are based on both the factor loadings from the exploratory factor analyses and the external validity of the individual items.

Accordingly, the following subscales were identified: Rule Breaking, Risk-Taking and Antisocial/Delinquent. As shown in table 5.2, the Rule Breaking subscale consisted of those items assessing normative adolescent non-compliance with rules, including talking to other students during class, eating/chewing gum during class, wearing clothing that one's parents don't approve of, using curse words/bad language, being loud/rowdy in public, reading other material during class, watching television and/or playing videogames that one's parents don't allow, kissing/hooking up with someone, passing notes or texting during class, lying to parents about where one is going/was, downloading music from the internet without paying, and not wearing a helmet when bike riding. The Risk-Taking subscale focused on those items assessing true risk-taking and included the following items: making a bet/gambling, hitchhiking, running away from home, watching/reading pornography, skipping school/class, joining a gang, using substances, riding in a car with an unlicensed or intoxicated driver, riding a bike/skateboard/rollerblades off a handrail/wall/staircase, and doing tricks with a bike/skateboard/rollerblades. Finally, the Antisocial/Delinquent scale focused on violations of other's rights or property and lying/cheating, including the following items: stealing from other people/stores, lying about one's age to purchase something, toilet-papering or otherwise messing up someone's house/car, sneaking out past curfew, writing on walls, desks or other surfaces, threatening another person, cheating on an assignment and helping someone else cheat.

⁹ Initially, the 31 items were divided into 6 subscales based on face validity (e.g. Substance Use, Delinquent Behaviors, Biking & Skateboarding, etc.) and Cronbach's alpha was used as a measure of internal consistency. Alpha values generally ranged from .52 to .75, with the one scale achieving a value of .37. As these values were largely below the "acceptable" criteria of .70, exploratory factor analysis was then used to consider alternative subscales.

The internal consistency of these subscales was then examined and Cronbach's alphas ranged from .74 to .79. Accordingly the internal consistency of each of the scales appears acceptable and items within the subscales can generally be considered to measure the same construct. The distributions of these subscales were then examined via Q-Q plots to determine whether the variables were normally distributed. As the distributions of the scores did not appear normal, non-parametric tests were used to confirm findings as appropriate.

Results:

First, the differences in risk-taking and delinquent behaviors between adolescents with and without intellectual disabilities were examined. A two-way ANOVA was used to examine the main effects of disability status and previous diagnosis of ODD as well as the interaction between these two variables. Table 5.3 shows results from the ANOVA.

For the Rule Breaking subscale, there was a significant main effect of having an developmental delay; individuals with DD demonstrated fewer rule-breaking behaviors. Likewise, there was a significant main effect of having met criteria for ODD on at least one occasion between ages 5 and 9¹⁰ with those youth demonstrating increased rule-breaking behaviors. There was no interaction between disability status and prior diagnosis of ODD.

For the Risk-Taking subscale, there was a significant main effect of having a developmental delay and adolescents with DD demonstrated fewer of these behaviors. However, there was no main effect of prior ODD nor any interaction between the two predictors.

Finally, for the Antisocial/Delinquent subscale, neither main effect nor the interaction were significant.¹¹

The role of gender was examined and two-way ANOVAs were run with gender and status group. Results from this analysis are presented in table 5.4. We found a main effect of gender

¹⁰ Results were the same when more stringent criteria were used (i.e. meeting ODD criteria on more than one occasion between ages 5-9).

¹¹ We also examined the total score for differences by status group and by ODD diagnosis. Results for the total score were identical to the rule breaking subscale, with the exception that group differences by ODD diagnosis were only significant at the trend level.

on Risk Taking only, such that males demonstrated more of these behaviors than females.

However, there were no significant interactions between status group and gender for any of the subscales.¹²

Differences in risk-taking and delinquent behavior were then examined using concurrent diagnoses of ODD on the DISC (at age 13). As these analyses only included data from the 13-year visit, these analyses were conducted both with the sample of continuing participants as well as with a larger sample that included participants recruited at 13 years of age. Although there was no main effect of ODD diagnosis on Rule Breaking and Risk-Taking subscales, a significant effect emerged for Antisocial/Delinquent behavior; participants with a concurrent diagnosis of ODD demonstrated more of these behaviors than those who did not meet ODD criteria. For the continuing subjects only, an interaction also emerged between ODD diagnosis at age 13 and status group on Antisocial/Delinquent behaviors (although there was no main effect of status).

Finally, individual items were examined for group differences by status group and prior diagnosis of ODD. Results from t-tests for status group differences suggest that children with developmental delays engage in the following behaviors with significantly less frequency than typically developing peers: talking in class when one is not supposed to, making a bet/gambling, being loud/rowdy in public (trend level, defined as $p < 0.10$), using curse words/bad language, reading other material besides class work (trend level), passing notes/texting during class (trend

¹² Examining the distributions of the subscales suggest that these variables are not normally distributed and thus, the two-way ANOVAs reported above may not be appropriate analyses. Accordingly, Mann-Whitney rank sum tests were used to confirm the main effects previously reported, accounting for the non-normal distributions of the dependent variables. Results from the Mann-Whitney rank sum test suggest that adolescents with intellectual disabilities have significantly lower scores on the Rule Breaking ($U = 555.00$, $z = -2.78$, $p = 0.005$), and Risk-Taking ($U = 650.00$, $z = -2.10$, $p = 0.036$) subscales, with a trend level group difference on the Antisocial/Delinquent ($U = 691.00$, $z = -1.75$, $p = 0.09$) subscale. These results are identical to those found in the two-way ANOVAs. Likewise, results from the Mann-Whitney rank sum test found no differences in any of the subscales by ODD diagnosis ($U = 1208.00$, $z = -1.08$, $p = 0.28$, $U = 1352.00$, $z = -0.16$, $p = 0.87$ and $U = 1249.50$, $z = -0.84$, $p = 0.40$, respectively), suggesting that having a previous diagnosis of ODD has no impact on risk-taking at 13 years of age. This is somewhat consistent with results from the two-way ANOVA analyses. However, findings from the two-way ANOVA suggest that individuals with a prior diagnosis of ODD have higher rates of Rule Breaking behavior at age 13.

Finally, results from the Mann-Whitney rank sum test suggest that there are no gender differences in the Rule Breaking and Antisocial/Delinquent subscales ($U = 1346.00$, $z = -0.89$, $p = 0.37$ and $U = 1339.50$, $z = -0.95$, $p = 0.34$, respectively). However, there do appear to be gender differences in the Risk-Taking subscale, with males receiving significantly higher scores on this subscale than females ($U = 899.50$, $z = -3.75$, $p < 0.001$). These results are consistent with findings from the two-way ANOVA.

level), riding in a car with an unlicensed or intoxicated driver (trend level), downloading music illegally, not wearing a helmet when biking/skateboarding/rollerblading (trend level), riding one's bike/skateboard/rollerblades off a rail/wall, and doing tricks on a bike/skateboard/rollerblades.

Results from t-tests for group differences by previous ODD diagnosis suggest that adolescents with a history of ODD engage in the following behaviors with significantly greater frequency than peers who have never met criteria for ODD previously: watch TV/play videogames that parents don't allow, written on walls, desks or other surfaces, used substances, helped another student cheat, and ridden in a car with an unlicensed or intoxicated driver.

Discussion:

Overall, results suggest that adolescents with developmental delays demonstrate fewer risk-taking behaviors than their typically developing peers. This is the case for normative rule-breaking/non-compliant behavior (Rule Breaking subscale) as well as true risk-taking behaviors (Risk-Taking subscale). However, adolescents with DD do not appear to differ from typically developing peers with regard to anti-social/delinquent behaviors and both status groups demonstrate relatively low frequencies of such behaviors.

This finding is contrary to our expectation that adolescents with DD would demonstrate higher rates of risk-taking and delinquent behaviors. One possibility is that the age of the participants in our sample may have contributed to this finding. The participants in this study are all 13 years of age and thus, at the very start of adolescence. As such, many of these adolescents may not have opportunities to engage in risk-taking and delinquent behaviors as the result of increased parental supervision and reduced freedoms relative to later adolescence. This may be particularly true for adolescents with DD, as they may receive closer supervision than their typically-developing peers that may prevent them from engaging in risk-taking behaviors. The school setting may also contribute to the fewer rule-breaking behaviors demonstrated by adolescents with DD. Particularly if adolescents with DD are in self-contained

classrooms or non-public schools, they may have closer supervision than is typically provided in a regular education middle school. Accordingly, adolescents with DD may have fewer opportunities to engage in non-compliant behaviors such as talking in class or reading other material besides class work.

With regard to oppositional defiant disorder, adolescents who met criteria for ODD between ages 5-9 appear to demonstrate higher rates of rule-breaking and non-compliance at age 13. However, these adolescents do not demonstrate higher rates of risk-taking behaviors nor do they show higher rates of anti-social or delinquent behaviors. However, when concurrent diagnoses of ODD were examined (at age 13), adolescents who met criteria for ODD demonstrated higher rates of anti-social and delinquent behaviors. These adolescents did not demonstrate higher rates of rule-breaking or risk-taking.

These findings are consistent with our expectations and suggest that adolescents with histories of ODD and those with concurrent ODD diagnoses are at greater risk for risk-taking and delinquent behaviors. Of note, however, previous ODD and concurrent ODD appear to be related to different subscales of risk-taking and delinquent behaviors. This makes sense within a developmental context. Children with a history of ODD during middle childhood demonstrate higher rates of normative non-compliance than their peers in later adolescence. This likely reflects a temperamentally-based tendency towards non-compliance, even when these adolescents no longer meet criteria for an ODD diagnosis. Adolescents who meet criteria for ODD at age 13, however, are likely at higher risk for developing conduct disorder and thus, the association between an ODD diagnosis at age 13 and anti-social behaviors (many of which are included in the diagnostic criteria for conduct disorder) is intuitive.

While our results demonstrate main effects of ODD diagnosis and status group, by and large we find no interactions between any of these variables on risk-taking and delinquency. It appears that the impact of having an ODD diagnosis does not differ for adolescents with DD and those with typical development. This finding provides support for the concept that ODD is the

same disorder for these two populations, having the same relationship to later outcomes for both groups.

When gender differences are examined, males demonstrate higher rates of risk-taking behaviors than females. This finding is intuitive given that many of the behaviors included in this subscale involve physical activities that are more often performed by adolescent males as opposed to adolescent females (e.g. skateboarding). Of note there is no interaction between gender and status, suggesting that males with DD and those with typical development both engage in risk-taking behaviors more than females.

Limitations

There are a few limitations to the present study that require consideration when interpreting the results. First, the primary measure used in the analyses is a self-report measure and thus, is influenced by the adolescent's understanding of the questions as well as his/her reporting biases. As discussed in the methods, this measure was administered with these possible limitations in mind. Adolescents completed this measure during the center visit. Prior to the assessment, adolescents were briefed on the fact that their responses to all measures would be private (with the exception of typical confidentiality limits regarding suicidal ideation, homicidal ideation and possible child or elder abuse). Furthermore, the survey was taken online and although the graduate student examiner was present and led the adolescent through the example questions, he/she sat in the opposite corner of the room engaged in another activity for the remainder of the administration. Adolescents were encouraged to ask questions if they were confused about a particular question and those adolescents who the examiner believe to need further assistance were aided through their completion of the measure. Accordingly, while there may be some limitations related to social desirability biases, these were reduced as much as possible by the procedure. Nonetheless, future research may focus on gathering collateral information to support the adolescents' self-report and future studies may elect to include parent, teacher and/or peer report of risk-taking and delinquency.

Another limitation relates to the sample size included in the study and in the DD group in particular. This limitation is particularly important with regard to the exploratory factor analyses. Ideally, an exploratory factor analysis would include many times more subjects (perhaps 10 times the current sample size) to truly evaluate the latent factors. As such, the results of the current exploratory factor analyses cannot be applied to other populations/in future studies and should be considered to only reflect the factors among the sample that completed the measure for this study.

Conclusions and Future Directions

Overall, our results suggest that adolescents with intellectual disabilities (and those with borderline intellectual functioning) demonstrate fewer rule-breaking and risk-taking behaviors than their typically developing peers. Adolescents with ODD demonstrate increased risk-taking and delinquent behaviors, although the specific behaviors depend on whether the adolescent meets ODD criteria previously or currently. Of particular importance, however, is the lack of interaction between status and ODD. It appears that these two variables do not interact and thus, that the impact of having ODD on risk-taking and delinquent behaviors does not differ for adolescents with and without intellectual disabilities.

As the participants included in the current study were 13 years of age and thus, at the start of adolescence, it is important for future research to address whether the results of the current study persist during late adolescence. It is possible that as adolescents age and gain greater freedoms, those with intellectual disabilities may start to have the same opportunities to engage in risk-taking behaviors as their typically developing peers. Accordingly, it is important to address whether adolescents with DD begin to engage in risk-taking and delinquent behaviors at the same, greater or lesser rates than their TD peers in later adolescence.

Table 5.1.

Demographics by Delay Status at Child Age 13

Demographic	Typically Developing (n=78)	Intellectual Disability (n=23)	X ² or t(df)
Child			
WISC-IV IQ	108.6 (12.8)	63.9 (12.7)	t = 13.6 (93)***
Vineland Scales of Adaptive Behavior	95.9 (10.4)	76.8 (9.5)	t = 7.4 (96)***
Gender (% Male)	42 (53.8%)	10 (50.0%)	X ² = 0.09 (N = 98)
Race/Ethnicity (% Caucasian-non Hispanic)	50 (64.1%)	7 (35.0%)	X ² = 5.54 (N=98)*
Mother and Family			
Income \$50,000 +	62 (79.5%)	12 (60.0%)	X ² = 3.27 (N=98)(*)
Mother's Years of Schooling	16.2 (2.4)	14.3 (2.2)	t = 3.17 (94)**

(*) p < .10, * p < .05, ** p < .01, *** p < .001

Table 5.2.

Items by Subscale and Cronbach's Alpha

Items	Rule Breaking	Risk-Taking	Antisocial/Delinquent
Talked to Others During Class	X		
Eaten Food/Chewed Gum in Class	X		
Worn Clothing Parents Disapproved of Outside of the Home	X		
Used Bad/Curse Words	X		
Loud or Rowdy in Public	X		
Read Other Materials Besides Classwork in Class	X		
Watched TV or Played Videogames that Parents Did Not Approve of	X		
Kissed Someone, Hooked Up, or Had Sex	X		
Passed Notes, Texted or Instant Messaged in Class	X		
Lied to Parents about Destination/Location	X		
Downloaded Music without Paying	X		
Not Worn a Helmet while Bike Riding, Skateboarding, or Rollerblading	X		
Made a Bet/Gambled		X	
Gotten into a Car with a Stranger/Hitchhiked		X	
Run Away From Home		X	
Watched/Read Pornography		X	
Skipped Class or School Without an Excuse		X	
In a Gang or Initiated into a Gang		X	
Smoked a Cigarette, Used Drugs, or Drank Alcohol		X	
Ridden in a Car with an Unlicensed/Intoxicated Driver		X	
Ridden a Bike, Skateboard or Rollerblades off a Staircase or Wall		X	
Have Done Tricks on a Bike, Skateboard or Rollerblades		X	
Stolen from Another Person/Store			X
Lied about My Age to Get in Someplace/Buy Something			X
T-ped/Messed Up Someone's Car or House			X
Snuck Out Past Curfew			X
Chatted with A Stranger Online			X
Written or Painted on Walls, Desks, or Other Surfaces			X
Threatened or Attacked Another Person			X
Cheated on a Test or Homework			X
Helped Someone Else Cheat			X
Cronbach's Alpha (α)	.79	.74	.74

Table 5.3.

Risk-Taking and Delinquent Behaviors by Status and ODD Diagnosis – ANOVA Results

	Means (St. Dev)				F Values		
	DD (n=23)	TD (n=78)	No ODD (n=50)	ODD (n=46)	Status	ODD	Status *ODD
Rule Breaking Subscale (12 Items)	18.09 (5.07)	21.74 (6.14)	20.02 (5.08)	21.94 (6.83)	10.60**	5.30*	0.29
Risk-Taking Subscale (10 Items)	10.74 (1.05)	11.95 (2.69)	11.55 (1.95)	11.85 (2.83)	4.36*	0.42	0.19
Antisocial/ Delinquent Subscale (9 Items)	10.74 (2.67)	11.46 (3.02)	10.82 (2.16)	11.57 (3.45)	1.60	1.41	0.12

(*) p < .10, * p < .05, ** p < .01, *** p < .001

Table 5.4.

Risk-Taking and Delinquent Behaviors by Status and Gender – ANOVA Results

	Means (St. Dev)				F Values		
	DD (n=23)	TD (n=78)	Male (n=55)	Female (n=46)	Status	Gender	Status *Gender
Rule Breaking Subscale (12 Items)	18.09 (5.07)	21.74 (6.14)	21.21 (6.17)	20.27 (5.99)	6.54*	0.15	0.02
Risk-Taking Subscale (10 Items)	10.74 (1.05)	11.95 (2.69)	12.37 (2.86)	10.78 (1.18)	4.67*	5.53*	0.89
Antisocial/ Delinquent Subscale (9 Items)	10.74 (2.67)	11.46 (3.02)	11.39 (2.96)	11.00 (2.74)	1.11	0.49	0.02

(*) p < .10, * p < .05, ** p < .01, *** p < .001

Chapter 9: Conclusions

The overarching question of this dissertation is whether or not ODD is the same disorder for children with and without developmental delays. Taking all of our results together, we conclude that the disorder appears to be the same for both populations – having similar clinical presentations, etiologies and outcomes.

With regard to the clinical presentation of ODD, we find significant group differences in the prevalence and comorbidity of the disorder; children with ID and those with borderline intellectual functioning demonstrate higher rates of ODD and increased comorbidity with other disorders (and ADHD in particular). Otherwise, the presentation of ODD in the two populations is not distinguishable. We find no status group differences in the age of onset, stability, gender distribution, number of symptoms, or endorsement of particular symptoms. Moreover, the differences in comorbidity may be explained by the elevated rates of other disorders (such as ADHD) for children with developmental delays (Baker et al., 2010) and thus, may not reflect differences in the presentation or underlying mechanisms of ODD.

With regard to the etiology of ODD, we find that child temperament, and anger proneness in particular, contributes to later externalizing behaviors. Likewise, parent psychopathology contributes to negative/controlling parenting behaviors. There is a negative relationship between negative/controlling parenting and externalizing behavior problems as well as a relationship between externalizing behavior problems and later ODD symptoms. With two minor exceptions, these relationships persist for youth with and without developmental delays. Moreover, when status group is examined as a predictor in the model, it appears to contribute to ODD symptoms via a strong relationship to externalizing behavior problems. Accordingly, it appears that the proposed etiological model for ODD is similar within the two status groups and that having a developmental delay may contribute to ODD symptoms through increased externalizing behavior problems.

Finally, with regard to outcomes of ODD, we examined trajectories of behavior problems, characteristics of friendships and risk-taking/delinquent behaviors. In each of these domains, we find differences between youth with and without developmental delays. Youth with developmental delays demonstrate higher rates of externalizing behavior problems and social problems, poorer friendship quality and fewer risk-taking/delinquent behaviors. We also find differences for youth who meet criteria for ODD (either concurrently or in middle childhood). In particular, adolescents with ODD demonstrate higher rates of externalizing behavior problems and social problems as well as more risk-taking/delinquent behaviors. There appears to be no impact of ODD on friendship quality. More importantly, however, in each of these cases, there is no significant interaction between ODD and status group, suggesting that the impact of ODD does not differ for children with and without ID.

Although we were not consistently able to examine the impact of ODD for children with ID and borderline intellectual functioning separately (often having to collapse these two groups into a developmentally delayed group as a result of small sample sizes), it appears that youth with borderline intellectual functioning demonstrate prevalence rates that are between those exhibited by youth with typical development and those with ID. Likewise, youth with borderline intellectual functioning have trajectories of externalizing behavior problems that are elevated relative to children with typical development, but below that of youth with ID.

Implications and Future Directions

We conclude that ODD appears to be the same disorder for children with and without developmental delays. However, children with ID and those with borderline intellectual functioning have elevated rates of ODD when compared with their typically developing peers. Accordingly, youth with ID may be a heightened risk for other negative outcomes not explored in this study. For example, youth with developmental delays may experience elevated rates of Conduct Disorder (CD) as 25% of children with ODD later develop CD (Lahey et al, 1992). This may be particularly true as children with ID and those with borderline intellectual functioning

transition to adolescence. Given the cognitive deficits noted among individuals with CD, further research may address whether Conduct Disorder is the same disorder for children with and without ID or whether increased parental monitoring and adaptive functioning deficits buffer this risk.

Nonetheless, our results suggest that ODD for children with ID and borderline intellectual functioning may be treated in the same manner as typically developing children. To date, the most effective treatments for ODD are behavioral parenting training programs such as The Incredible Years (Webster-Stratton & Reid, 2003) and the Triple P-Positive Parenting Program (Sanders et al, 2000, JAACAP Practice Parameter, 2007). Our results suggest that these treatments may be successfully implemented with parents of children with ID and borderline intellectual functioning. Although some modifications will be needed to account for the level of cognitive delay, there appears to be nothing qualitatively different about ODD for children with mild or moderate ID that would prevent parents from using the same behavioral techniques as used for typically developing children with ODD.

References:

- Abells, D., Burbidge, J., & Minnes, P. (2008). Involvement of adolescents with intellectual disabilities in social and recreational activities. *Journal on Developmental Disabilities, 14*(2), 88-94.
- Aboud, F. E., & Mendelson, M. J. (1996). Determinants of friendship selection and quality: Developmental perspectives. In W. M. Bukowski, A. F. Newcomb & W. W. Hartup (Eds.), *The company they keep: Friendship in childhood and adolescence*. (pp. 87-112). New York, NY, US: Cambridge University Press.
- Achenbach, T. M., & Rescorla, L. A. (2000). *Manual for ASEBA Preschool Forms and Profiles*. Burlington: University of Vermont, Department of Psychiatry.
- Achenbach, T. M., & Rescorla, L. A. (2001). *Manual for ASEBA School-Age Forms and Profiles*. Burlington: University of Vermont, Department of Psychiatry.
- Allen, D. (1989). The effects of deinstitutionalisation on people with mental handicaps: A review. *Mental Handicap Research, 2*(1), 18-37.
- American Psychiatric Association (2000). *Diagnostic and statistical manual of mental disorders, DSM-IV, Fourth Edition Text Revision*. Washington, DC: American Psychiatric Association.
- Andreasen, N.C. (1995). The validation of psychiatric diagnoses: new models and approaches. *American Journal of Psychiatry, 152*, 161-162.
- Angold, A., & Costello, J. (1996). Toward establishing an empirical basis for the diagnosis of oppositional defiant disorder. *Journal of the American Academy of Child & Adolescent Psychiatry, 35*(9), 1205-1212.

- Antshel, K. M., Phillips, M. H., Gordon, M., Barkley, R., & Faraone, S. V. (2006). Is ADHD a valid disorder in children with intellectual delays? *Clinical Psychology Review*, 26(5), 555-572.
- August, G. J., Realmuto, G. M., Joyce, T., & Hektner, J. M. (1999). Persistence and desistance of oppositional defiant disorder in a community sample of children with ADHD. *Journal of the American Academy of Child & Adolescent Psychiatry*, 38(10), 1262-1270.
- Bagwell, C. L., Newcomb, A. F., & Bukowski, W. M. (1998). Preadolescent friendship and peer rejection as predictors of adult adjustment. *Child Development*, 69(1), 140-153.
- Baker, B. L., Blacher, J., Crnic, K. A., & Edelbrock, C. (2002). Behavior problems and parenting stress in families of three-year-old children with and without developmental delays. *American Journal on Mental Retardation*, 107(6), 433-444.
- Baker, B. L., McIntyre, L. L., Blacher, J., Edelbrock, C., Low, C., & Crnic, K. (2003). Pre-school children with and without developmental delay: Behaviour problems and parenting stress over time. *Journal of Intellectual Disability Research. Special Issue on Family Research*, 47(4-5), 217-230.
- Baker, B. L., Neece, C. L., Fenning, R. M., Crnic, K. A., & Blacher, J. (2010). Mental disorders in five-year-old children with or without developmental delay: Focus on ADHD. *Journal of Clinical Child and Adolescent Psychology*, 39(4), 492-505.
- Bates, J. E., Bayles, K., Bennett, D. S., Ridge, B., & Brown, M. M. (1991). Origins of externalizing behavior problems at eight years of age. In D. J. Pepler, & K. H. Rubin (Eds.), *The development and treatment of childhood aggression*. (pp. 93-120). Hillsdale, NJ, England: Lawrence Erlbaum Associates, Inc
- Bayley, N. (1969). *Manual for the Bayley Scales of Infant Development*. New York: Psychological Corporation.

- Belsky, J., Woodworth, S., & Crnic, K. (1996). Trouble in the second year: Three questions about family interaction. *Child Development, 67*(2), 556-578.
- Berndt, T. J. (1989). Friendships in childhood and adolescence. In W. Damon (Ed.), *Child development today and tomorrow*. (pp. 332-348). San Francisco, CA, US: Jossey-Bass.
- Berndt, T. J. (1996). Friendships in adolescence. In N. Vanzetti, & S. Duck (Eds.), *A lifetime of relationships*. (pp. 181-212). Belmont, CA, US: Thomson Brooks/Cole Publishing Co.
- Berndt, T. J., & Perry, T. B. (1986). Children's perceptions of friendships as supportive relationships. *Developmental Psychology, 22*(5), 640-648.
- Borthwick-Duffy, S. A. (1994). Epidemiology and Prevalence of Psychopathology in People with Mental Retardation. *Journal of Consulting and Clinical Psychology, 62*(1), 17-27.
- Browne, M. W. & Cudeck, R. (1993). Alternative ways of assessing model fit. In: Bollen, K. A. & Long, J. S. (Eds.) *Testing Structural Equation Models*. pp. 136–162. Beverly Hills, CA: Sage
- Bryk, A. S., & Raudenbush, S. W. (1992). *Hierarchical linear models: Applications and data analysis methods*. Thousand Oaks, CA, US: Sage Publications, Inc.
- Buhrmester, D. (1996). Need fulfillment, interpersonal competence, and the developmental contexts of early adolescent friendship. In W. M. Bukowski, A. F. Newcomb & W. W. Hartup (Eds.), *The company they keep: Friendship in childhood and adolescence*. (pp. 158-185). New York, NY, US: Cambridge University Press.
- Bukowski, W. M. (., Newcomb, A. F., & Hartup, W. W. (Eds.). (1996). *The company they keep: Friendship in childhood and adolescence*. New York, NY, US: Cambridge University Press.
- Bukowski, W. M., Gauze, C., Hoza, B., & Newcomb, A. F. (1993). Differences and consistency between same-sex and other-sex peer relationships during early adolescence. *Developmental Psychology, 29*(2), 255-263.

- Bukowski, W. M., Hoza, B., & Boivin, M. (1994). Measuring friendship quality during pre- and early adolescence: The development and psychometric properties of the friendship qualities scale. *Journal of Social and Personal Relationships. Special Issue: Children's Friendships*, 11(3), 471-484.
- Burke, J. D., Hipwell, A. E., & Loeber, R. (2010). Dimensions of oppositional defiant disorder as predictors of depression and conduct disorder in preadolescent girls. *Journal of the American Academy of Child & Adolescent Psychiatry*, 49(5), 484-492.
- Buss, A. H., & Plomin, R. (1975). *A temperament theory of personality development*. Oxford, England: Wiley-Interscience.
- Campbell, S. B. (1994). Hard-to-manage preschool boys: Externalizing behavior, social competence, and family context at two-year follow-up. *Journal of Abnormal Child Psychology: An Official Publication of the International Society for Research in Child and Adolescent Psychopathology*, 22(2), 147-166.
- Campbell, S. B., & Ewing, L. J. (1990). Follow-up of hard-to-manage preschoolers: Adjustment at age 9 and predictors of continuing symptoms. *Journal of Child Psychology and Psychiatry*, 31(6), 871-889.
- Campbell, S. B., March, C. L., Pierce, E. W., & Ewing, L. J. (1991). Hard to manage preschool boys: Family context and the stability of externalizing behavior. *Journal of Abnormal Child Psychology: An Official Publication of the International Society for Research in Child and Adolescent Psychopathology*, 19(3), 301-318.
- Campbell, S. B., Pierce, E. W., March, C. L., & Ewing, L. J. (1994). Hard-to-manage preschool boys: Symptomatic behavior across contexts and time. *Child Development*, 65(3), 836-851.

- Carlson, C. L., Tamm, L., & Gaub, M. (1997). Gender differences in children with ADHD, ODD, and co-occurring ADHD/ODD identified in a school population. *Journal of the American Academy of Child & Adolescent Psychiatry*, 36(12), 1706-1714.
- Edward G. Carmines and John P. McIver (1981) "Analyzing Models with Unobserved Variables: Analysis of Covariance Structures." In George W. Bohrnstedt and Edgar F. Borgatta, eds. *Social Measurement: Current Issues*. Beverly Hills, CA: Sage Publications, 65-115.
- Caspi, A., & Moffitt, T. E. (1995). The continuity of maladaptive behavior: From description to understanding in the study of antisocial behavior. In D. Cicchetti, & D. J. Cohen (Eds.), *Developmental psychopathology, vol. 2: Risk, disorder, and adaptation*. (pp. 472-511). Oxford, England: John Wiley & Sons.
- Cielinski, K.L., Vaughn, B., Seifer, R. & Conteras, J. (1995). Relations among sustained engagement during play, quality of play, and mother-child interaction in samples of children with down syndrome and normally developing toddlers. *Infant Behavior and Development*, 18, 163-176.
- Coie, J. D., & Dodge, K. A. (1998). Aggression and antisocial behavior. In W. Damon, & N. Eisenberg (Eds.), *Handbook of child psychology, 5th ed.: Vol 3. social, emotional, and personality development*. (pp. 779-862). Hoboken, NJ, US: John Wiley & Sons Inc.
- Coie, J. D., Dodge, K. A., Terry, R., & Wright, V. (1991). The role of aggression in peer relations: An analysis of aggression episodes in boys' play groups. *Child Development*, 62(4), 812-826.
- Coleman, J. C., & Hendry, L. B. (1999). *The nature of adolescence (3rd ed.)*. Florence, KY, US: Taylor & Frances/Routledge.
- Connolly, J., Furman, W., & Konarski, R. (2000). The role of peers in the emergence of heterosexual romantic relationships in adolescence. *Child Development*, 71(5), 1395-1408.

- Cormack, K. F. M., Brown, A. C., & Hastings, R. P. (2000). Behavioural and emotional difficulties in students attending schools for children and adolescents with severe intellectual disability. *Journal of Intellectual Disability Research. Special Issue: Mental Health and Intellectual Disability: VI, 44(2)*, 124-129.
- Costello, E. J., Edelbrock, C. S., & Costello, A. J. (1985). Validity of the NIMH diagnostic interview schedule for children: A comparison between psychiatric and pediatric referrals. *Journal of Abnormal Child Psychology, 13(4)*, 579-595.
- de Ruiter, K. P., Dekker, M. C., Verhulst, F. C., & Koot, H. M. (2007). Developmental course of psychopathology in youths with and without intellectual disabilities. *Journal of Child Psychology and Psychiatry, 48(5)*, 498-507.
- Deater-Deckard, K. (2001). Annotation: Recent research examining the role of peer relationships in the development of psychopathology. *Journal of Child Psychology and Psychiatry, 42(5)*, 565-579.
- Dekker, M. C., & Koot, H. M. (2003). DSM-IV disorders in children with borderline to moderate intellectual disability. I: Prevalence and impact. *Journal of the American Academy of Child & Adolescent Psychiatry, 42(8)*, 915-922.
- Derogatis, L. R., & Coons, H. L. (1993). Self-report measures of stress. In L. Goldberger, & S. Breznitz (Eds.), *Handbook of stress: Theoretical and clinical aspects (2nd ed.)*. (pp. 200-233). New York, NY, US: Free Press.
- Dickson, K., Emerson, E., & Hatton, C. (2005). Self-reported anti-social behaviour: Prevalence and risk factors amongst adolescents with and without intellectual disability. *Journal of Intellectual Disability Research, 49(11)*, 820-826.
- Dishion, T. J., Andrews, D. W., & Crosby, L. (1995). Antisocial boys and their friends in early adolescence: Relationship characteristics, quality, and interactional process. *Child Development, 66(1)*, 139-151.

- Dishion, T. J., Eddy, M., Haas, E., & Li, F. (1997). Friendships and violent behavior during adolescence. *Social Development, 6*(2), 207-223.
- Dodge, K. A. (1983). Behavioral antecedents of peer social status. *Child Development, 54*(6), 1386-1399.
- Donenberg, G., & Baker, B. L. (1993). The impact of young children with externalizing behaviors on their families. *Journal of Abnormal Child Psychology, 21*(2), 179-198.
- Dyson, L. L. (1997). Fathers and mothers of school-age children with developmental disabilities: Parental stress, family functioning, and social support. *American Journal on Mental Retardation, 102*(3), 267-279.
- Edelbrock, C., Crnic, K. & Bohnert, A. (1999). Interviewing as communication: an alternative way of administering the Diagnostic Interview Schedule for Children. *Journal of Abnormal Child Psychology, 27*(6), 447-453.
- Eder, D., & Hallinan, M. T. (1978). Sex differences in children's friendships. *American Sociological Review, 43*(2), 237-250.
- Egeland, B., Kalkoske, M., Gottesman, N., & Erickson, M. F. (1990). Preschool behavior problems: Stability and factors accounting for change. *Journal of Child Psychology and Psychiatry, 31*(6), 891-909.
- Einfeld, S. L., & Tonge, J. (1996). Population prevalence of psychopathology in children and adolescents with intellectual disability: I. rationale and methods. *Journal of Intellectual Disability Research, 40*(2), 91-98.
- Einfeld, S. L., Ellis, L. A., & Emerson, E. (2011). Comorbidity of intellectual disability and mental disorder in children and adolescents: A systematic review. *Journal of Intellectual and Developmental Disability, 36*(2), 137-143.
- Eisenhower, A. S., Baker, B. L., & Blacher, J. (2009). Children's delayed development and behavior problems: Impact on mothers' perceived physical health across early childhood. *Social Science & Medicine, 68*(1), 89-99.

- Elkins, I. J., Iacono, W. G., & Doyle, A. E. (1997). Characteristics associated with the persistence of antisocial behavior: Results from recent longitudinal research. *Aggression and Violent Behavior, 2*(2), 101-124.
- Ellickson, P. L., Collins, R. L., Hambarsoomians, K., & McCaffrey, D. F. (2005). Does alcohol advertising promote adolescent drinking? results from a longitudinal assessment. *Addiction, 100*(2), 235-246.
- Elliot, D. S., & Huizinga, D. (1983). Social Class and Delinquent Behavior in a National Youth Panel: 1976-1980. *Criminology, 21*(2), 149-177.
- Emerson, E. (1995). *Challenging behaviour: Analysis and intervention in people with learning disabilities*. New York, NY, US: Cambridge University Press.
- Emerson, E. (2003). Mothers of children and adolescents with intellectual disability: Social and economic situation, mental health status, and the self-assessed social and psychological impact of the child's difficulties. *Journal of Intellectual Disability Research. Special Issue on Family Research, 47*(4-5), 385-399.
- Emerson, E. (2003). Prevalence of psychiatric disorders in children and adolescents with and without intellectual disability. *Journal of Intellectual Disability Research, 47*(1), 51-58.
- Emerson, E., & Einfeld, S. (2010). Emotional and behavioural difficulties in young children with and without developmental delay: A bi-national perspective. *Journal of Child Psychology and Psychiatry, 51*(5), 583-593.
- Emerson, E., & Hatton, C. (2007). Mental health of children and adolescents with intellectual disabilities in Britain. *British Journal of Psychiatry, 191*(6), 493-499.
- Emerson, E., Einfeld, S., & Stancliffe, R. J. (2011). Predictors of the persistence of conduct difficulties in children with cognitive delay. *Journal of Child Psychology and Psychiatry, 52*(11), 1184-1194.

- Estes, A., Munson, J., Dawson, G., Koehler, E., Zhou, X., & Abbott, R. (2009). Parenting stress and psychological functioning among mothers of preschool children with autism and developmental delay. *Autism, 13*(4), 375-387.
- Faust, H., & Scior, K. (2008). Mental health problems in young people with intellectual disabilities: The impact on parents. *Journal of Applied Research in Intellectual Disabilities, 21*(5), 414-424.
- Feiring, C. (1999). Other-sex friendship networks and the development of romantic relationships in adolescence. *Journal of Youth and Adolescence, 28*(4), 495-512.
- Felce, D., Kerr, M., & Hastings, R. P. (2009). A general practice-based study of the relationship between indicators of mental illness and challenging behaviour among adults with intellectual disabilities. *Journal of Intellectual Disability Research. Special Issue: Mental Health and Intellectual Disability: XXV, 53*(3), 243-254.
- Fenning, R. M., Baker, J. K., Baker, B. L., & Crnic, K. A. (2007). Parenting children with borderline intellectual functioning: A unique risk population. *American Journal on Mental Retardation, 112*(2), 107-121.
- Fergusson, D. M., Horwood, L. J., & Ridder, E. M. (2005). Show me the child at seven II: Childhood intelligence and later outcomes in adolescence and young adulthood. *Journal of Child Psychology and Psychiatry, 46*(8), 850-858.
- Fisher, P. W., Shaffer, D., Piacentini, J., & Lapkin, J. (1993). Sensitivity of the diagnostic interview schedule for children, 2nd edition (DISC-2.1) for specific diagnoses of children and adolescents. *Journal of the American Academy of Child & Adolescent Psychiatry, 32*(3), 666-673.
- Fletcher, R., Loschen, E., Stavrakaki, C., & First, M. (Eds.). (2007). *Diagnostic Manual -- Intellectual Disability (DM-ID): A Clinical Guide for Diagnosis of Mental Disorders in Persons with Intellectual Disability*. Kingston, NY: NADD Press.

- French, D. C., & Waas, G. A. (1985). Behavior problems of peer-neglected and peer-rejected elementary-age children: Parent and teacher perspectives. *Child Development, 56*(1), 246-252.
- Frick, P. J., Lahey, B. B., Loeber, R., & Tannenbaum, L. (1993). Oppositional defiant disorder and conduct disorder: A meta-analytic review of factor analyses and cross-validation in a clinic sample. *Clinical Psychology Review, 13*(4), 319-340.
- Frick, P. J., Lahey, B. B., Loeber, R., Stouthamer-Loeber, M., Christ, M. A. G., & Hanson, K. (1992). Familial risk factors to oppositional defiant disorder and conduct disorder: Parental psychopathology and maternal parenting. *Journal of Consulting and Clinical Psychology, 60*(1), 49-55.
- Frison, S. L., Wallander, J. L., & Browne, D. (1998). Cultural factors enhancing resilience and protecting against maladjustment in African American adolescents with mild mental retardation. *American Journal on Mental Retardation, 102*(6), 613-626.
- Frostad, P., & Pijl, S. J. (2007). Does being friendly help in making friends? the relation between the social position and social skills of pupils with special needs in mainstream education. *European Journal of Special Needs Education, 22*(1), 15-30.
- Furman, W. & Buhrmester, D. (1992). Age and Sex Differences in Perceptions of Networks of Personal Relationships. *Child Development. 63*(1), 103-115.
- Ge, X., Conger, R.D., Candoret, R.J., Neiderhiser, J.M., Yates, W., Troughton, E. & Steward, M.A. (1996). The developmental interface between nature and nurture: A mutual influence model of child antisocial behavior and parent behaviors. *Developmental Psychology, 32*(4), 574-589.
- Ge, X., Donnellan, M. B., & Wenk, E. (2001). The development of persistent criminal offending in males. *Criminal Justice and Behavior, 28*(6), 731-755.

- Geisthardt, C. L., Brotherson, M. J., & Cook, C. C. (2002). Friendships of children with disabilities in the home environment. *Education & Training in Mental Retardation & Developmental Disabilities, 37*(3), 235-252.
- Gilliom, M., & Shaw, D. S. (2004). Codevelopment of externalizing and internalizing problems in early childhood. *Development and Psychopathology, 16*(2), 313-333.
- Goldsmith, H. H. (1996). Studying temperament via construction of the Toddler Behavior Assessment Questionnaire. *Child Development, 67*, 218-235.
- Gottfredson, M. R., Hirschi, T. (1990). A general theory of crime. Stanford, CA : Stanford University Press.
- Gullone, E., Moore, S., Moss, S., & Boyd, C. (2000). The adolescent risk-taking questionnaire: Development and psychometric evaluation. *Journal of Adolescent Research, 15*(2), 231-250.
- Guralnick, M. J. (1997). Peer social networks of young boys with developmental delays. *American Journal on Mental Retardation, 101*(6), 595-612.
- Guralnick, M. J., & Groom, J. M. (1988). Friendships of preschool children in mainstreamed playgroups. *Developmental Psychology, 24*(4), 595-604.
- Guralnick, M. J., Gottman, J. M., & Hammond, M. A. (1996). Effects of social setting on the friendship formation of young children differing in developmental status. *Journal of Applied Developmental Psychology, 17*(4), 625-651.
- Guralnick, M. J., Hammond, M. A., & Connor, R. T. (2003). Subtypes of nonsocial play: Comparisons between young children with and without developmental delays. *American Journal on Mental Retardation, 108*(5), 347-362.
- Hartup, W. W. (1993). Adolescents and their friends. In B. Laursen (Ed.), *Close friendships in adolescence*. (pp. 3-22). San Francisco, CA, US: Jossey-Bass.
- Hartup, W. W. (1996). The company they keep: Friendships and their developmental significance. *Child Development, 67*(1), 1-13.

- Hayes, S., Shackell, P., Mottram, P., & Lancaster, R. (2007). The prevalence of intellectual disability in a major UK prison. *British Journal of Learning Disabilities, 35*(3), 162-167.
- Heiman, T. (2000). Friendship quality among children in three educational settings. *Journal of Intellectual & Developmental Disability, 25*(1), 1-12.
- Heiman, T. (2000). Quality and quantity of friendship: Students' and teachers' perceptions. *School Psychology International, 21*(3), 265-280.
- Henry, B., Caspi, A., Moffitt, T. E., & Silva, P. A. (1996). Temperamental and familial predictors of violent and nonviolent criminal convictions: Age 3 to age 18. *Developmental Psychology, 32*(4), 614-623.
- Herman, M. & Shantz, C. (1983). Social problem solving and mother-child interactions of educable mentally retarded children. *Journal of Applied Developmental Psychology, 4*, 217-226.
- Herring, S., Gray, K., Taffe, J., Tonge, B., Sweeney, D., & Einfeld, S. (2006). Behaviour and emotional problems in toddlers with pervasive developmental disorders and developmental delay: Associations with parental mental health and family functioning. *Journal of Intellectual Disability Research, 50*(12), 874-882.
- Hestenes, L. L., & Carroll, D. E. (2000). The play interactions of young children with and without disabilities: Individual and environmental influences. *Early Childhood Research Quarterly, 15*(2), 229-246.
- Hodapp, R. M., Ricci, L. A., Ly, T. M., & Fidler, D. J. (2003). The effects of the child with down syndrome on maternal stress. *British Journal of Developmental Psychology, 21*(1), 137-151.
- Holden, B., & Gitlesen, J. P. (2003). Prevalence of psychiatric symptoms in adults with mental retardation and challenging behaviour. *Research in Developmental Disabilities, 24*(5), 323-332.

- Hu, L., & Bentler, P. M. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, 6(1), 1-55.
- Jaffee, S. R., Belsky, J., Harrington, H., Caspi, A., & Moffitt, T. E. (2006). When parents have a history of conduct disorder: How is the caregiving environment affected? *Journal of Abnormal Psychology*, 115(2), 309-319.
- Jensen, P. S., Hinshaw, S. P., Kraemer, H. C., Lenora, N., Newcorn, J. H., Abikoff, H. B., March, J. S., Arnold, L. E., Cantwell, D. P., Connors, C. K., Elliott, G. R., Greenhill, L. L., Hechtman, L., Hoza, B., Pelham, W. E., Severe, J. B., Swanson, J. M., Wells, K. C., Wigal, T., & Vitiello, B. (2001). ADHD comorbidity findings from the MTA study: Comparing comorbid subgroups. *Journal of the American Academy of Child & Adolescent Psychiatry*, 40(2), 147-158.
- Jensen, P., Roper, M., Fisher, P., & Piacentini, J. (1995). Test-retest reliability of the diagnostic interview schedule for children (DISC 2.1): Parent, child, and combined algorithms. *Archives of General Psychiatry*, 52(1), 61-71.
- Jessor, R. (1987). Problem-behavior theory, psychosocial development, and adolescent problem drinking. *British Journal of Addiction. Special Issue: Psychology and Addiction*, 82(4), 331-342.
- Kagan, J. (1989). Temperamental contributions to social behavior. *American Psychologist*, 44(4), 668-674.
- Kaplan, H. B., and Robbins, C. (1983). Testing a general theory of deviant behavior in longitudinal
- Keenan, K., & Shaw, D. (1997). Developmental and social influences on young girls' early problem behavior. *Psychological Bulletin*, 121(1), 95-113.

- Keenan, K., & Shaw, D. S. (1995). The development of coercive family processes: The interaction between aversive toddler behavior and parenting factors. In J. McCord (Ed.), *Coercion and punishment in long-term perspectives*. (pp. 165-180). New York, NY, US: Cambridge University Press.
- Kenny, D. A., & McCoach, D. B. (2003). Effect of the number of variables on measures of fit in structural equation modeling. *Structural Equation Modeling*, *10*(3), 333-351.
- Kenny, D. A., Kaniskan, B., & McCoach, D. B. (2011). *The performance of RMSEA in models with small degrees of freedom*. Unpublished paper, University of Connecticut.
- Kessler, R. C., Berglund, P., Demler, O., Jin, R., Merikangas, K. R., & Walters, E. E. (2005). "Lifetime prevalence and age-of-onset distributions of DSM-IV disorders in the national comorbidity survey replication": Erratum. *Archives of General Psychiatry*, *62*(7), 768-768.
- Kessler, R. C., Nelson, C. B., McGonagle, K. A., & Liu, J. (1996). Comorbidity of DSM-III—R major depressive disorder in the general population: Results from the US national comorbidity survey. *British Journal of Psychiatry*, *168*(30), 17-30.
- Kratzer, L., & Hodgins, S. (1999). A typology of offenders: A test of moffitt's theory among males and females from childhood to age 30. *Criminal Behaviour and Mental Health*, *9*(1), 57-73.
- Lahey, B. B., & Loeber, R. (1994). Framework for a developmental model of oppositional defiant disorder and conduct disorder. In D. K. Routh (Ed.), *Disruptive behavior disorders in childhood*. (pp. 139-180). New York, NY, US: Plenum Press.
- Lahey, B. B., Conger, R. D., Atkeson, B. M., & Treiber, F. A. (1984). Parenting behavior and emotional status of physically abusive mothers. *Journal of Consulting and Clinical Psychology*, *52*(6), 1062-1071.

- Lahey, B. B., Loeber, R., Quay, H. C., & Frick, P. J. (1992). Oppositional defiant and conduct disorders: Issues to be resolved for DSM-IV. *Journal of the American Academy of Child & Adolescent Psychiatry, 31*(3), 539-546.
- Lahey, B. B., Loeber, R., Stouthamer-Loeber, M., & Christ, M. A. (1990). Comparison of DSM-III and DSM-III—R diagnoses for prepubertal children: Changes in prevalence and validity. *Journal of the American Academy of Child & Adolescent Psychiatry, 29*(4), 620-626.
- Lahey, B. B., Miller, T., L., Gordon., R. A., & Riley, A. W. (1999). Developmental epidemiology of the disruptive behavior disorders. In H. C. Quay & A. E. Hogan (Eds.), *Handbook of disruptive behavior disorders* (pp. 23-45) New York, Plenum Press.
- Lahey, B. B., Schwab-Stone, M., Goodman, S. H., Waldman, I. D., Canino, G., Rathouz, P. J., . . . Jensen, P. S. (2000). Age and gender differences in oppositional behavior and conduct problems: A cross-sectional household study of middle childhood and adolescence. *Journal of Abnormal Psychology, 109*(3), 488-503.
- Lahey, B. B., Waldman, I. D., & McBurnett, K. (1999). The development of antisocial behavior: An integrative causal model. *Journal of Child Psychology and Psychiatry, 40*(5), 669-682.
- Lahey, B.B., Applegate, B., Barkley, R.A., Garfinkle, B., McBurnett, K., Kerdyk, L., et al., (1994). *DSM-IV* field trials for oppositional defiant disorder and conduct disorder in children and adolescents. *American Journal of Psychiatry. 151*, 1163-1171.
- Lakin, K. C., Doljanic, R., Taub, S., Chiri, G., & Byun, S. (2007). Adults with dual diagnoses of intellectual and psychiatric disability receiving medicaid home and community-based services (HCBS) and ICF/MR recipients in six states. *Mental Health Aspects of Developmental Disabilities, 10*(3), 78-90.

- Lavigne, J. V., Cicchetti, C., Gibbons, R. D., Binns, H. J., Larsen, L., & DeVito, C. (2001). Oppositional defiant disorder with onset in preschool years: Longitudinal stability and pathways to other disorders. *Journal of the American Academy of Child & Adolescent Psychiatry, 40*(12), 1393-1400.
- Lavigne, J. V., Gibbons, R. D., Christoffel, K. K., Arend, R., Rosenbaum, D., Binns, H., Dawson, N., Sobel, H., & Isaacs, C. (1998). *Prevalence rates and correlates of psychiatric disorders among preschool children*. Philadelphia, PA, US: Brunner/Mazel.
- Laws, G., Taylor, M., Bennie, S., & Buckley, S. (1996). Classroom behaviour, language competence, and the acceptance of children with down syndrome by their mainstream peers. *Down Syndrome: Research & Practice, 4*(3), 100-109.
- Leung, K., & Lau, S. (1989). Effects of self-concept and perceived disapproval of delinquent behavior in school children. *Journal of Youth and Adolescence, 18*(4), 345-359.
- Lillehoj, C. J., Trudeau, L., Spoth, R., & Madon, S. (2005). Externalizing behaviors as predictors of substance initiation trajectories among rural adolescents. *Journal of Adolescent Health, 37*(6), 493-501.
- Linna, S. L., Moilanen, I., Ebeling, H., Piha, J., Kumpulainen, K., Tamminen, T. and Almqvist, F. (1999). Psychiatric symptoms in children with intellectual disability. *European Child and Adolescent Psychiatry 8*(4), 77-82.
- Loeber, R. (1982). The stability of antisocial and delinquent child behavior: A review. *Child Development, 53*(6), 1431-1446.
- Loeber, R., & Stouthamer-Loeber, M. (1998). Juvenile aggression at home and at school. In D. S. Elliott, B. A. Hamburg & K. R. Williams (Eds.), *Violence in american schools: A new perspective*. (pp. 94-126). New York, NY, US: Cambridge University Press.
- Loeber, R., Burke, J. D., Lahey, B. B., Winters, A., & Zera, M. (2000). Oppositional defiant and conduct disorder: A review of the past 10 years, part I. *Journal of the American Academy of Child & Adolescent Psychiatry, 39*(12), 1468-1484.

- Loeber, R., Keenan, K., Lahey, B. B., & Green, S. M. (1993). Evidence for developmentally based diagnoses of oppositional defiant disorder and conduct disorder. *Journal of Abnormal Child Psychology*, *21*(4), 377-410.
- Lumley, V. A., McNeil, C. B., Herschell, A. D., & Bahl, A. B. (2002). An examination of gender differences among young children with disruptive behavior disorders. *Child Study Journal*, *32*(2), 89-100.
- Lustig, D. C. (1999). Families with an adult with mental retardation: Predictors of family adjustment. *Journal of Applied Rehabilitation Counseling*, *30*(3), 11-18.
- Lynam, D. R., & Henry, B. (2001). The role of neuropsychological deficits in conduct disorders. In J. Hill, & B. Maughan (Eds.), *Conduct disorders in childhood and adolescence*. (pp. 235-263). New York, NY, US: Cambridge University Press.
- Lynam, D., Moffitt, T. E., & Stouthamer-Loeber, M. (1993). "Explaining the relation between IQ and delinquency: Class, race, test motivation, school failure, or self-control?" correction. *Journal of Abnormal Psychology*, *102*(4), 552-552.
- Maas, C. J. M., & Hox, J. J. (2005). Sufficient sample sizes for multilevel modeling. *Methodology: European Journal of Research Methods for the Behavioral and Social Sciences*, *1*(3), 86-92.
- Maccoby, E. E. (1988). Gender as a social category. *Developmental Psychology*, *24*(6), 755-765.
- Maes, B., Broekman, T. G., Došen, A., & Nauts, J. (2003). Caregiving burden of families looking after persons with intellectual disability and behavioural or psychiatric problems. *Journal of Intellectual Disability Research*, *47*(6), 447-455.
- Marfo, K. (1992). Correlates of maternal directiveness with children who are developmentally delayed. *American Journal of Orthopsychiatry*, *6*(2), 219-233.
- Matheson, C., Olsen, R. J., & Weisner, T. (2007). A good friend is hard to find: Friendship among adolescents with disabilities. *American Journal on Mental Retardation*, *112*(5), 319-329.

- Mathiesen, K. S., Sanson, A., Stoolmiller, M., & Karevold, E. (2009). The nature and predictors of undercontrolled and internalizing problem trajectories across early childhood. *Journal of Abnormal Child Psychology: An Official Publication of the International Society for Research in Child and Adolescent Psychopathology*, 37(2), 209-222.
- Maughan, B., Rowe, R., Messer, J., Goodman, R., & Meltzer, H. (2004). Conduct disorder and oppositional defiant disorder in a national sample: Developmental epidemiology. *Journal of Child Psychology and Psychiatry*, 45(3), 609-621.
- McDermott, P. A. (1996). A nationwide study of developmental and gender prevalence for psychopathology in childhood and adolescence. *Journal of Abnormal Child Psychology: An Official Publication of the International Society for Research in Child and Adolescent Psychopathology*, 24(1), 53-66.
- McGee, R., Partridge, F., Williams, S., & Silva, P. A. (1991). A twelve-year follow-up of preschool hyperactive children. *Journal of the American Academy of Child & Adolescent Psychiatry*, 30(2), 224-232.
- McIntyre, L. L., Blacher, J., & Baker, B. L. (2002). Behaviour/mental health problems in young adults with intellectual disability: The impact on families. *Journal of Intellectual Disability Research. Special Issue: Mental Health and Intellectual Disability: X*, 46(3), 239-249.
- Mesman, J., Stoel, R., Bakermans-Kranenburg, M. J., van IJzendoorn, M. H., Juffer, F., Koot, H. M., & Alink, L. R. A. (2009). Predicting growth curves of early childhood externalizing problems: Differential susceptibility of children with difficult temperament. *Journal of Abnormal Child Psychology: An Official Publication of the International Society for Research in Child and Adolescent Psychopathology*, 37(5), 625-636.
- Moffitt, T. E., & Silva, P. A. (1988). IQ and delinquency: A direct test of the differential detection hypothesis. *Journal of Abnormal Psychology*, 97(3), 330-333.

- Moffitt, T. E., Caspi, A., Rutter, M., & Silva, P. A. (2001). *Sex differences in antisocial behaviour: Conduct disorder, delinquency, and violence in the dunedin longitudinal study*. New York, NY, US: Cambridge University Press.
- Molteno, G., Molteno, C. D., Finchilescu, G. & Dawes, A. R. L. (2001) Behavioral and emotional problems in children with intellectual disability attending special schools in Cape Town, South Africa. *Journal of Intellectual Disability Research*. 45(6), 515-520.
- Moss, S., Emerson, E., Kiernan, C., Turner, S., Hatton, C., & Alborz, A. (2000). Psychiatric symptoms in adults with learning disability and challenging behaviour. *British Journal of Psychiatry*, 177, 452-456.
- Murphy, G. H., Harnett, H., & Holland, A. J. (1995). A survey of intellectual disabilities amongst men on remand in prison. *Mental Handicap Research*, 8(2), 81-98.
- Neece, C. L., Green, S. A., & Baker, B. L. (2012). Parenting stress and child behavior problems: A transactional relationship across time. *American Journal on Intellectual and Developmental Disabilities*, 117(1), 48-66.
- Newcomb, A. F., Bukowski, W. M., & Pattee, L. (1993). Children's peer relations: A meta-analytic review of popular, rejected, neglected, controversial, and average sociometric status. *Psychological Bulletin*, 113(1), 99-128.
- Nock, M. K., Kazdin, A. E., Hiripi, E., & Kessler, R. C. (2007). Lifetime prevalence, correlates, and persistence of oppositional defiant disorder: Results from the national comorbidity survey replication. *Journal of Child Psychology and Psychiatry*, 48(7), 703-713.
- Olsson, M. B., & Hwang, C. P. (2001). Depression in mothers and fathers of children with intellectual disability. *Journal of Intellectual Disability Research. Special Issue: Mental Health and Intellectual Disability: IX*, 45(6), 535-543.
- Orsmond, G. I., Seltzer, M. M., Krauss, M. W., & Hong, J. (2003). Behavior problems in adults with mental retardation and maternal well-being: Examination of the direction of effects. *American Journal on Mental Retardation*, 108(4), 257-271.

- Osman, B. B. (1984). A study of social competence in educationally at-risk preschool children. ProQuest Information & Learning). *Dissertation Abstracts International*, 44 (7-A), 2087-2088.
- Osman, B. B. (1984). *A study of social competence in educationally at-risk preschool children*. ProQuest Information & Learning). *Dissertation Abstracts International*, 44(7-A), 2087-2088. (Electronic; Print)
- Parker, J. G., & Asher, S. R. (1993). Friendship and friendship quality in middle childhood: Links with peer group acceptance and feelings of loneliness and social dissatisfaction. *Developmental Psychology*, 29(4), 611-621.
- Parten, M. B. (1932). Social participation among pre-school children. *The Journal of Abnormal and Social Psychology*, 27(3), 243-269.
- Patterson, G. R., & Stouthamer-Loeber, M. (1984). The correlation of family management practices and delinquency. *Child Development*, 55(4), 1299-1307.
- perspective. In Van Dusen, K. T., and Mednick, S. A. (eds.), *Prospective Studies of Crime and Delinquency*. Kluwer-Nijhoff, Boston.
- Piacentini, J., Shaffer, D., Fisher, P. W., & Schwab-Stone, M. (1993). The diagnostic interview schedule for Children—Revised version (DISC—R): III. concurrent criterion validity. *Journal of the American Academy of Child & Adolescent Psychiatry*, 32(3), 658-665.
- Reiss, S., Levitan, G. W., & Szyszko, J. (1982). Emotional disturbance and mental retardation: Diagnostic overshadowing. *American Journal of Mental Deficiency*, 86(6), 567-574.
- Rey, J. M. (1993). Oppositional defiant disorder. *The American Journal of Psychiatry*, 150(12), 1769-1778.
- Robins, E., & Guze, S. B. (1970). Establishment of diagnostic validity in psychiatric illness: Its application to schizophrenia. *American Journal of Psychiatry*, 126(7), 983-986.

- Rojahn, J., Matson, J. L., Naglieri, J. A., & Mayville, E. (2004). Relationships between psychiatric conditions and behavior problems among adults with mental retardation. *American Journal on Mental Retardation*, 109(1), 21-33.
- Rojahn, J., & Meier, L.J. (2009). Epidemiology of mental illness and maladaptive behavior in intellectual disabilities. *International Review of Research in Mental Retardation*, 38 , 239–287.
- Rubin, K. H., Bukowski, W., & Parker, J. G. (1998). Peer interactions, relationships, and groups. In W. Damon, & N. Eisenberg (Eds.), *Handbook of child psychology, 5th ed.: Vol 3. social, emotional, and personality development*. (pp. 619-700). Hoboken, NJ, US: John Wiley & Sons Inc.
- Rubin, K. H., Coplan, R., Chen, X., Buskirk, A. A., & Wojslawowicz, J. C. (2005). In Bornstein M. H., Lamb M. E. (Eds.), *Peer relationships in childhood*. Mahwah, NJ, US: Lawrence Erlbaum Associates Publishers.
- Rubin, K. H., Lynch, D., Coplan, R., & Rose-Krasnor, L. (1994). "Birds of a feather...": Behavioral concordances and preferential personal attraction in children. *Child Development*, 65(6), 1778-1785.
- Sampson, R. J., & Laub, J. H. (1993). *Crime in the making: Pathways and turning points through life*. Cambridge, MA, US: Harvard University Press.
- Sanders, M. R., Markie-Dadds, C., Tully, L. A., & Bor, W. (2000). The triple P-positive parenting program: A comparison of enhanced, standard, and self-directed behavioral family intervention for parents of children with early onset conduct problems. *Journal of Consulting and Clinical Psychology*, 68(4), 624-640.
- Sanson, A., & Prior, M. (1999). In Quay H. C., Hogan A. E. (Eds.), *Temperament and behavioral precursors to oppositional defiant disorder and conduct disorder*. Dordrecht, Netherlands: Kluwer Academic Publishers.

- Sattler, J.M. and Dumont, R. (2004). *Assessment of children: WISC-IV and WPPSI-III*. San Diego, Ca.
- Schneider, B. H., Wiener, J., & Murphy, K. (1994). Children's friendships: The giant step beyond peer acceptance. *Journal of Social and Personal Relationships. Special Issue: Children's Friendships*, 11(3), 323-340.
- Schwab-Stone, M., Fisher, P. W., Piacentini, J., & Shaffer, D. (1993). The diagnostic interview schedule for Children—Revised version (DISC—R): II. test-retest reliability. *Journal of the American Academy of Child & Adolescent Psychiatry*, 32(3), 651-657.
- Serra-Pinheiro, M. A., Mattos, P., & Regalla, M. A. (2008). Inattention, hyperactivity, and oppositional--defiant symptoms in brazilian adolescents: Gender prevalence and agreement between teachers and parents in a non-english speaking population. *Journal of Attention Disorders*, 12(2), 135-140.
- Shaffer, D., Schwab-Stone, M., Fisher, P. W., & Cohen, P. (1993). The diagnostic interview schedule for children--revised version (DISC--R) I: Preparation, field testing, interrater reliability, and acceptability. *Journal of the American Academy of Child & Adolescent Psychiatry*, 32(3), 643-650.
- Shaw, D. S., & Winslow, E. B. (1997). Precursors and correlates of antisocial behavior from infancy to preschool. In D. M. Stoff, J. Breiling & J. D. Maser (Eds.), *Handbook of antisocial behavior*. (pp. 148-158). Hoboken, NJ, US: John Wiley & Sons Inc.
- Shedler, J., & Block, J. (1990). Adolescent drug use and psychological health: A longitudinal inquiry. *American Psychologist*, 45(5), 612-630.
- Shrum, W., Cheek, N. H., & Hunter, S. M. (1988). Friendship in school: Gender and racial homophily. *Sociology of Education*, 61(4), 227-239.

- Simons, R. L., Chao, W., Conger, R. D., & Elder, G. H. (2001). Quality of parenting as mediator of the effect of childhood defiance on adolescent friendship choices and delinquency: A growth curve analysis. *Journal of Marriage & the Family*, 63(1), 63-79.
- Sparrow, S. S., Cicchetti, D. V., & Balla, B. A. (2005). Vineland Scales of Adaptive Behavior-Second Ed. Circle Pine, MN: American Guidance Service.
- Speltz, M. L., McClellan, J., DeKlyen, M., & Jones, K. (1999). Preschool boys with oppositional defiant disorder: Clinical presentation and diagnostic change. *Journal of the American Academy of Child & Adolescent Psychiatry*, 38(7), 838-845.
- Stattin, H., & Klackenberglarsson, I. (1993). Early language and intelligence development and their relationship to future criminal behavior. *Journal of Abnormal Psychology*, 102(3), 369-378.
- Steiner, H., Remsing, L., & Work Group on Quality Issues. (2007). Practice parameter for the assessment and treatment of children and adolescents with oppositional defiant disorder. *Journal of the American Academy of Child & Adolescent Psychiatry*, 46(1), 126-141.
- Stores, R., Stores, G., Fellows, B., & Buckley, S. (1998). Daytime behaviour problems and maternal stress in children with down's syndrome, their siblings, and non-intellectually disabled and other intellectually disabled peers. *Journal of Intellectual Disability Research*, 42(3), 228-237.
- Stringaris, A., & Goodman, R. (2009). Longitudinal outcome of youth oppositionality: Irritable, headstrong, and hurtful behaviors have distinctive predictions. *Journal of the American Academy of Child & Adolescent Psychiatry*, 48(4), 404-412.
- Stringaris, A., & Goodman, R. (2009). Three dimensions of oppositionality in youth. *Journal of Child Psychology and Psychiatry*, 50(3), 216-223.
- Strømme, P., & Diseth, T. H. (2000). Prevalence of psychiatric diagnoses in children with mental retardation: Data from a population-based study. *Developmental Medicine & Child Neurology*, 42(4), 266-270.

- Sullivan, H. S. (1953). *The interpersonal theory of psychiatry*. New York, NY, US: W W Norton & Co.
- Tan, T. X. (2011). Two-year follow-up of girls adopted from china: Continuity and change in behavioural adjustment. *Child and Adolescent Mental Health*, 16(1), 14-21.
- Tanaka, J. S. (1987). "How big is big enough?": Sample size and goodness of fit in structural equation models with latent variables. *Child Development*, 58(1), 134-146.
- Thorndike RL, Hagen EP, Sattler JM. *The Stanford-Binet Intelligence Scale* . 4th ed. *Guide for administering and scoring the fourth edition* . Chicago : Riverside Publishing, 1986.
- Tremblay, R. E. (1992). The prediction of delinquent behavior from childhood behavior: Personality theory revisited. In J. McCord (Ed.), *Facts, frameworks, and forecasts*. (pp. 193-230). New Brunswick, NJ, US: Transaction Publishers.
- Turnbull, A. P., Blue-Banning, M., & Pereira, L. (2000). Successful friendships of hispanic children and youth with disabilities: An exploratory study. *Mental Retardation*, 38(2), 138-153.
- Turnbull, A. P., Pereira, L., & Blue-Banning, M. J. (1999). Parents' facilitation of friendships between their children with a disability and friends without a disability. *Journal of the Association for Persons with Severe Handicaps*, 24(2), 85-99.
- Vaillant, G. E., & Davis, J. T. (2003). In Hertzig M. E., Farber E. A. (Eds.), *Social/emotional intelligence and midlife resilience in schoolboys with low tested intelligence*. New York, NY, US: Brunner-Routledge.
- Vaillant, G. E., & Davis, J. T. (2003). *Social/emotional intelligence and midlife resilience in schoolboys with low tested intelligence*. New York, NY, US: Brunner-Routledge.

- Vaughn, S., & Elbaum, B. (1999). The self-concept and friendships of students with learning disabilities: A developmental perspective. In R. Gallimore, L. P. Bernheimer, D. L. MacMillan, D. L. Speece & S. Vaughn (Eds.), *Developmental perspectives on children with high-incidence disabilities*. (pp. 81-107). Mahwah, NJ, US: Lawrence Erlbaum Associates Publishers.
- Vitaro, F., Brendgen, M., & Tremblay, R. E. (2000). Influence of deviant friends on delinquency: Searching for moderator variables. *Journal of Abnormal Child Psychology: An Official Publication of the International Society for Research in Child and Adolescent Psychopathology*, 28(4), 313-325.
- Vitaro, F., Tremblay, R. E., & Bukowski, W. M. (2001). Friends, friendships and conduct disorders. In J. Hill, & B. Maughan (Eds.), *Conduct disorders in childhood and adolescence*. (pp. 346-378). New York, NY, US: Cambridge University Press.
- Webster, A. A., & Carter, M. (2007). Social relationships and friendships of children with developmental disabilities: Implications for inclusive settings. A systematic review. *Journal of Intellectual & Developmental Disability*, 32(3), 200-213.
- Webster-Stratton, C. (2005). The incredible years: A training series for the prevention and treatment of conduct problems in young children. In E. D. Hibbs, P. S. Jensen, E. D. Hibbs & P. S. Jensen (Eds.), *Psychosocial treatments for child and adolescent disorders: Empirically based strategies for clinical practice (2nd ed.)*. (pp. 507-555). Washington, DC, US: American Psychological Association.
- Wechsler, D. (2003). *WISC-IV Technical and Interpretive Manual*. San Antonio, TX; Psychological Corporation.
- Whitaker, S., & Read, S. (2006). The prevalence of psychiatric disorders among people with intellectual disabilities: An analysis of the literature. *Journal of Applied Research in Intellectual Disabilities*, 19(4), 330-345.

- World Health Organization (1992). *The ICD-10 classification of mental and behavioural disorders: Clinical descriptions and diagnostic guidelines*. Geneva: Author.
- Wiener, J., & Schneider, B. H. (2002). A multisource exploration of the friendship patterns of children with and without learning disabilities. *Journal of Abnormal Child Psychology: An Official Publication of the International Society for Research in Child and Adolescent Psychopathology*, 30(2), 127-141.
- Wiener, J., & Sunohara, G. (1998). Parents' perceptions of the quality of friendship of their children with learning disabilities. *Learning Disabilities Research & Practice*, 13(4), 242-257.
- Zetlin, A. G., & Murtaugh, M. (1988). Friendship patterns of mildly learning handicapped and nonhandicapped high school students. *American Journal on Mental Retardation*, 92(5), 447-454.