

# Attention-Deficit/Hyperactivity Disorder and Oppositional/Conduct Problems: Links to Parent-Child Interactions

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## Abstract

**Introduction:** We outline a transactional model of parent-child interactions which proposes that characteristics of attention-deficit/hyperactivity disorder (ADHD) appear early in a child's life and present challenges to the parent's ability to maintain consistent and responsive parenting. In turn, the presence of harsh or inconsistent parenting is hypothesized to contribute to the development of child oppositional behaviour and conduct problems. **Method and Results:** We briefly discuss existing cross-sectional evidence in support of this model and then highlight five longitudinal studies that provide stronger support, showing that difficulties in parenting predict the development of oppositional and conduct problems in children with ADHD, over and above pre-existing levels of child problems and other predictors. **Conclusion:** We conclude with a discussion of the clinical implications of this model and evidence, emphasizing the need for early interventions in ADHD focused on parenting. **Key words:** ADHD, oppositional defiant, conduct disorder, parenting, parent-child, parent psychopathology

## Résumé

**Introduction:** Nous proposons un modèle d'interaction parent-enfant selon lequel les caractéristiques du trouble du déficit d'attention avec hyperactivité apparaîtraient tôt dans la vie de l'enfant et mettraient au défi les capacités des parents d'exercer leur rôle de façon cohérente et appropriée. D'autre part nous partons de l'hypothèse qu'une éducation sévère et inconsistante contribue à l'émergence d'un comportement oppositionnel chez l'enfant et de problèmes de conduite. **Méthodologie et résultats:** Nous présentons brièvement les échantillons qui soutiennent ce modèle et mettons ensuite en relief cinq études longitudinales selon lesquelles les difficultés d'éducation annoncent les problèmes d'opposition et de conduite chez les enfants souffrant de TDAH, indépendamment des problèmes antérieurs chez les enfants et des autres prédicteurs. **Conclusion:** Nous terminons par une discussion des implications cliniques de ce modèle et de ces constatations en mettant l'accent sur la nécessité d'une intervention rapide orientée sur l'éducation chez les enfants souffrant de TDAH. **Mots clés:** TDAH; trouble oppositionnel; trouble de conduite; éducation; interaction parent-enfant; psychopathologie parentale

Investigators have found strong evidence for genetic contributions to attention-deficit/hyperactivity disorder (ADHD) (Eaves et al., 1997) and our understanding of the cognitive and neurobiological mechanisms underlying the disorder's phenotypic variability has grown increasingly sophisticated (Krain & Castellanos, 2006; Nigg, 2005). At the same time, the social context surrounding a child's symptoms of ADHD remains critical to understanding and intervening with this disorder. In particular, difficulties in parent-child interactions are often the impetus for help-seeking, and interventions to address these difficulties have much to offer in minimizing the negative impact of ADHD on child and family in both the short- and long-term. We present a model that places parenting not in a causative role in childhood ADHD, but rather as a variable that influences the development of comorbid oppositional/conduct problems. Throughout the paper, we use the term oppositional/conduct problems as inclusive of the diagnostic categories of Oppositional Defiant Disorder and Conduct Disorder, the symptoms of these disorders, and dimensional measures of these constructs. Where appropriate, we elaborate on the particular diagnostic criteria employed in studies.

## Model of ADHD and Parent-Child Interactions

Interactions between parents and children are seen as transactional, with characteristics of each influencing one another and the parent-child relationship over time (Sameroff & Chandler, 1975). Thus, early child characteristics may serve as the initial instigator of problems, but over time continued child problems and parenting difficulties serve to perpetuate each other. As applied to families of children with ADHD, it is widely acknowledged that variability in capacities such as reactivity and self-regulation appears very early in life (Pettit & Bates, 1989; Rothbart & Bates, 1998). Although at present there is little evidence of the specificity of these characteristics to particular forms of later psychopathology, there is general consensus that among these early precursors are the origins of ADHD (Nigg, 2000). Given such early child difficulties, the importance of responsive parenting for optimizing child development is clear (Grusec & Goodnow, 1994). Responsive parenting is a broad term

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referring to the parent's ability to read and respond appropriately to a child's cues, and it encompasses both warmth/acceptance and the ability to exert control in a manner that is firm, consistent, and sensitive to the child's needs (Johnston, Murray, Hinshaw, Pelham, & Hoza, 2002). We contend that early manifestations of ADHD, whether characterized according to symptoms outlined in the Diagnostic and Statistical Manual-IV-TR (American Psychiatric Association, 2000) or as dimensions of temperament such as reactive and effortful control, present significant challenges to responsive parenting. When interacting with a young child who has difficulty modulating his or her emotional states or directing attention and who is unpredictable and impulsive, most parents will have difficulty reliably following the child's cues and providing the type of scaffolding or external guidance needed to assist the child in achieving greater self-regulatory abilities. This relative lack of responsiveness, caused by the high level of needs of a child with ADHD interacting with the parent's difficulties in following and reading the child's cues, serves to increase the child's frustration and negative affect, and sets the stage for the child learning coercive and oppositional behaviors.

Oppositional/conduct problems are the most highly comorbid conditions with ADHD, occurring in 30% to 60 % of cases (Biederman et al., 1991). Although biological influence on these conditions is acknowledged (Dick, Fiken, Kaprio, Pulkkinen, & Rose, 2005), the majority of evidence supports a social learning view of the origins of oppositional/conduct problems. Harsh and inconsistent parenting, and a lack of nurturance or warmth, are clearly associated with oppositional/conduct problems in children (Frick, 1994), and interventions to alter these parenting behaviors are recommended practice (Brestan & Eyberg, 1998). As outlined above, we propose that childhood ADHD acts as a stressor that elevates the likelihood of the parenting difficulties commonly associated with child oppositional/conduct problems. That is, high levels of child inattention or impulsivity place multiple demands on parents, and increase the likelihood that parents will respond to the child with less than optimum consistency (e.g., giving in to the child), with over-reactive discipline (e.g., angry outbursts), or with inap-

propriate withdrawal from the child (e.g., avoidance of interactions). Together, the child's ADHD and these parenting difficulties interact to produce the necessary conditions for the development of oppositional/conduct problems.

This model also acknowledges other factors which may compromise parenting ability, such as life stress, marital discord, or parental psychopathology. For example, an extensive literature describes the role of depression in compromising parenting abilities and perpetuating child problems (c. f. Elgar, McGrath, Waschbusch, Stewart, & Curtis, 2004). Such variables can easily be seen as feeding into difficult parent-child interactions and elevating the likelihood of child oppositional/conduct problems. In particular, we draw attention to recent research supporting the role of parental ADHD as a factor contributing to parenting difficulties (Chen & Johnston, in press; Murray & Johnston, 2006).

#### **Evidence of Associations Among ADHD, Oppositional/Conduct Problems, and Parenting**

Numerous cross-sectional studies have documented an association between parenting difficulties and the presence of oppositional/conduct problems in children with ADHD (see Johnston & Mash, 2001 and Waschbusch, 2002 for reviews). In our lab, for example, we have used both self-reports of parenting (including positive involvement and harsh or over-reactive discipline) and an observational measure of parental responsiveness to study this question. In two studies using cross-sectional designs (Johnston et al., 2002; Seipp & Johnston, 2005), we found that parenting difficulties were significantly associated with the level of oppositional behavior in children with ADHD, in contrast to very small or nonsignificant associations between these dimensions of parenting and the child's level of ADHD symptoms.

Despite numerous replications of this association between parenting problems and oppositional/conduct problems in children with ADHD, we reiterate that most of the existing studies are cross-sectional in nature. As such, they are not able to address the causal nature of the relation. Although such studies are consistent with the view that parenting contributes to the development of child oppositional/

conduct problems, other possibilities such as genetically determined child oppositional/conduct behaviors (which in turn act to impair parenting), or a third variable (such as parental ADHD) acting as causal to both child oppositional/conduct problems and poor parenting, are clear possibilities. Indeed, we would not argue that these factors are not contributory, or that parenting alone plays a causal role. However, more informative research designs are needed to elucidate the relative contributions of these factors in the developmental trajectories of children with ADHD.

Longitudinal studies of the linkages between child ADHD, parenting, and child oppositional/conduct problems offer some ability to clarify this question (although other options, such as intervention trials and genetically informed designs, also are needed). In longitudinal studies, it is possible, through timing of measurement and/or statistical controls, to examine the temporal precedence of the child and parent variables, providing at least preliminary evidence regarding causality. In Table 1, we present five studies using longitudinal designs that have addressed this question.

The earliest of these studies is from Barkley, Fischer, Edelbrock and Smallish's (1991) adolescent follow-up of children initially assessed as ADHD or control. Among multiple analyses and outcomes considered in this paper, we focus on the finding that mothers' reports of children's conduct problems in adolescence were predicted, not only by initial levels of child conduct problems, but also by the mothers' observed directiveness with the child during play at first assessment. Given the unstructured nature of play, increased maternal commands in this situation seem reflective of an unnecessary or nonresponsive level of maternal control. Unfortunately, this analysis, based on both ADHD and control families, did not control for early levels of child ADHD. The second longitudinal analysis comes from Biederman, Mick, Faraone, and Burbach's (2001) 4-year longitudinal study of a large sample of children, all of whom had ADHD. In this report, children with ADHD were categorized as having persistent versus remitting/desistent conduct disorder. Children with persisting conduct problems had higher levels of family conflict as well as lower family cohesion

at baseline, and child-reported problems with parents at baseline significantly predicted continued conduct problems in adolescence. Third, August, Realmuto, Joyce, and Hektner (1999) report persistence of oppositional defiant disorder (ODD) in a sample of children with ADHD (or subthreshold levels of the disorder) and nondisordered controls. Logistic regressions indicated that, controlling for baseline levels of ADHD and ODD, mothers' reports of negative parenting at baseline were a significant predictor of ODD, but not of ADHD, at follow-up. Fourth, a new study by Chronis et al. (2007) reported on a large sample of children with ADHD, followed for 2 to 8 years. In regression analyses controlling for demographic variables as well as baseline levels of ADHD and conduct problems, observed maternal positive parenting in a task situation at baseline was a significant negative predictor of future conduct problems. Thus, positive parenting, which assessed responsive praise and acceptance of the child during challenging tasks, proved to be an important protective factor in the development of conduct problems. Finally, a recently completed study in our lab (Johnston, Hommersen, & Seipp, 2007) not only found that overreactive and less responsive parenting predicted increases in oppositional/conduct problems among children with ADHD (with initial levels of oppositional/conduct and ADHD symptoms controlled), but that negative child-blaming attributions for the child's behaviour also contributed unique variance to the level of oppositional/conduct problems at the 1-year follow-up.

In sum, these studies offer relatively strong evidence of a link between initial levels of responsive parenting and the development, continuation, or exacerbation of oppositional/conduct problems in children with ADHD. It is of interest to note the consistency of findings across these studies, despite the variability in the methods used to classify both ADHD and oppositional/conduct problems. Some of the studies use standard, structured diagnostic interviews, and assess ADHD, ODD and/or CD using current diagnostic criteria (e.g., Biederman et al., 2001; Chronis et al., 2007). Others rely on parent and/or teacher ratings to classify children as ADHD (Johnston et al., 2007), or use earlier diagnostic formulations of

**Table 1**

Authors (Year)	Sample Characteristics & Groups	N's	Age at FA; TTF	Family Measures & Child ADHD & ODD/CD Measures	Main Findings
August et al. (1999)	80% male, 20% female. 95% Caucasian, 5% African-American. Range of SES represented, but mostly middle- & upper-middle-class.	T1: 451 T2: 296	6-10; 4 years to FUP	Behavioral Management Self-Assessment, Behavioral Assessment System for Children (family); Parent-rated (usually by mothers) DICA-R-P (ADHD, CD & ODD).	In ADHD children, with T1 ADHD and ODD controlled, parenting practices at T1 predicted ODD— not ADHD— at T2.
Barkley et al. (1991)	91% male, 9% female; 94% Caucasian, 5% African-American, 1% Latino. Mean SES: middle-class.	T1: 239 T2: 160	4-12; 8 years to FUP.	Response Class Matrix (family); Mother-rated R-CPRS, HSQ, & Werry-Weiss-Peters Activity Rating Scale (ADHD); Mother-rated R-CPRS & HSQ (CD).	In ADHD and control children, with T1 conduct problems controlled, frequency of maternal commands during observed T1 mother-child interactions was associated with T2 conduct problems.
Biederman et al. (2001)	100% male, Caucasian; SES range, mostly middle-class, no lowest SES stratum.	T1: 140 T2: 128	6-17; 4 years to FUP.	FES Family Conflict, Family Cohesion, Family Expressiveness (family); Mother-reported and self-reported (for ≥ 12-year-olds) K-SADS-E (ADHD, CD, ODD).	In ADHD children with persistent CD, desistent CD, and no CD: persistent CD was associated with increased family conflict and decreased family cohesion at T1.
Chronis et al. (2007)	80% male; 20% female. 68% white, 30% African-American; SES not specified.	T1: 125 T2: 108	4-7; 8 years to FUP (annual assessments)	Dyadic Parent-Child Interaction Coding System (family); Mother-rated and teacher-rated DISC & CIRS (ADHD); Mother-rated and teacher-rated DISC (CD & ODD).	In ADHD children, with T1 ADHD and CD controlled, maternal positive parenting at T1 negatively predicted child conduct problems 2-8 years later.
Johnston et al. (2007)	100% male. 82% Caucasian, 18% other. SES range, mean SES upper-middle-class range.	T1: 107 T2: 97.	7-10; 1 year to FUP.	PS Over-Reactivity, Maternal Responsiveness Coding System; Written Analogue Questionnaire (family); ADHD-IV Rating Scale (ADHD); ODDRS & observed child noncompliance in laboratory mother-child interactions (ODD).	In ADHD and control children, controlling for T1 ODD, more over-reactive, and less responsive T1 parenting, as well as more child-blaming T1 parental attributions were associated with greater child oppositional behavior at T2.

Age at FA, age at first assessment; TTF, time to follow-up; ADHD, Attention-Deficit/Hyperactivity Disorder; ODD, Oppositional Defiant Disorder; CD, Conduct Disorder; T1, Time 1 (baseline); T2, Time 2 (follow-up); FUP, follow-up; DICA-R-P, Diagnostic Interview for Children and Adolescents— Revised Parent Version; R-CPRS, Revised Conners Parent Rating Scale; HSQ, Home Situations Questionnaire; FES, Family Environment Scale; K-SADS-E, Kiddie Schedule for Affective Disorders and Schizophrenia— Epidemiologic version; DISC, Diagnostic Interview Schedule for Children; CIRS, Children's Impairment Rating Scale; PS, Parenting Scale; ODDRS, Oppositional Defiant Disorder Rating Scale.

ADHD, as well as conduct or oppositional disorder (Barkley et al., 1991). This consistency is reassuring and suggests that the links demonstrated are not specific to any particular diagnostic or assessment method. In contrast, inspection of Table 1 shows that the studies

are based on samples of solely or predominantly male Caucasian children, and the extent to which results are generalizable to girls or other ethnic groups remains an open question.

We also note that these results are consistent with those from studies using community

samples where ADHD and oppositional symptoms are measured dimensionally. For example, Jester and colleagues (2005) reported, in a large sample of children followed from elementary-school age to adolescence, that family conflict and lower cohesion at baseline predicted an escalation of child aggression even with the level of inattention/hyperactivity symptoms held constant. The longitudinal nature of these designs, with parenting measured at baseline and initial levels of oppositional/conduct problems as well as ADHD symptoms controlled, reduces the likelihood that child oppositional/conduct problems are the sole drivers of this relationship and that parenting difficulties are only a response to these child characteristics. Instead, consistent with the proposed model, a combination of child ADHD symptoms and difficulties in parenting are seen as predictive of increases in child oppositional/conduct problems over time. Clearly, third variable explanations may still account for the longitudinal relationships. However, in both the August et al. (1999) and Chronis et al. (2007) studies, analyses indicated that although parental psychopathologies (a likely third variable) contributed to the development of child oppositional/conduct problems, parenting continued to be a significant predictor, independent of the effects of parental psychopathology.

In summary, we argue that existing data is consistent with the hypothesis that, among children with ADHD, parenting difficulties act to place the child at increased risk for developing oppositional/conduct problems and for experiencing the negative consequences associated with this comorbidity. However, it should be noted that neither the model, nor the existing data, suggest that ADHD, even when not accompanied by oppositional/conduct problems, does not also carry increased risk for negative outcome. For example, other longitudinal studies (e.g., Flory et al., 2006; Molina & Pelham, 2003) have found that childhood ADHD predicts a number of risky behavior outcomes in adolescence and young adulthood (e.g., early pregnancies, increased substance use), independent of the influence of oppositional behaviour. Our understanding of the factors that underlie the different developmental trajectories of children with ADHD is clearly preliminary and awaits further study.

## Clinical Implications

The longitudinal studies noted above strongly suggest the need for clinicians to attend to parenting in both the assessment and treatment of children with ADHD. Although parenting may not contribute to ADHD symptoms, the transactional model and the data from the longitudinal studies reviewed here demonstrate that parents' abilities to be responsive in their interactions with children with ADHD do play an important role in the development of troublesome oppositional/conduct problems in these children. Children with co-occurring ADHD and oppositional/conduct problems are those most likely to have negative outcomes in a variety of domains (e.g., Waschbusch, 2002). Thus, early detection and assistance with parenting difficulties may offset some of the most pernicious outcomes for children with ADHD. Indeed, as suggested by outcomes from the Multimodal Treatment of ADHD study (MTA Cooperative Group, 1999), interventions that combined medication (to directly reduce child ADHD symptoms) with training in behavioral parenting strategies serve to reduce oppositional child behavior, improve parent-child interactions, and are able to have a positive impact at multiple points in the transactional model.

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