Childhood Conduct Problems are Associated with Increased Partnership and Parenting Difficulties in Adulthood
Abstract

This paper uses data from a sample of 337 parents studied at age 30 to examine the linkages between childhood conduct problems assessed at ages 7-9 and later partnership and parenting outcomes. The key findings of this study were: 1) increasing levels of childhood conduct problems were associated with increased risk of partnership difficulties, including relationship ambiguity, inter-partner conflict/violence and lower levels of relationship satisfaction; 2) increasing levels of childhood conduct problems were associated with increased risk of parenting difficulties, including over-reactivity, lax and inconsistent discipline, child physical punishment and lower levels of parental warmth and sensitivity. These findings were consistent across both parent reports and interviewer ratings, and in nearly all cases remained after extensive adjustment for confounding and selection bias. Study findings add to the growing body of evidence documenting the adverse consequences of early conduct problems for later adult interpersonal relationships and parenting behaviors.

Keywords

Conduct problems, Longitudinal development, Partnership, Parenting behaviors
Early conduct problems and later partnership and parenting risk

**Introduction**

Childhood conduct problems, including conduct disorder and oppositional defiant disorder, are the most common childhood psychiatric problem, affecting about 10% of children and accounting for around half of all child mental health referrals between the ages of 9 and 15 years (Brandenburg et al. 1990; Colman et al. 2009; Costello et al. 2003). There has been a large body of research focusing on the long term continuities of conduct problems in childhood and adolescence. These studies have found that young people with conduct problems are at increased risk for later crime (Farrington 1995; Fergusson et al. 2005; Rutter 1987), antisocial personality in adulthood (Caspi 2000; Fergusson et al. 2005; Moffitt et al. 1996; Offord and Bennett 1994), and pervasive social difficulties (Fergusson et al. 2005; Zoccolillo et al. 1992). Furthermore, increasing evidence suggests that childhood conduct problems tend to be highly stable over time and persist well into adulthood (Loeber et al. 2009). In addition, concerns might also be raised about the effects of a childhood history of conduct problems on an individual’s capacity to meet the demands and responsibilities of parenthood and to provide their children with optimal parental care. However, to date, less attention has been given to the long term consequences of conduct problems for partnership choices or parenting attitudes and behaviors.

Previous research examining the linkage between conduct problems in young people and later partnership and parenting has variously suggested that:

a) Young people with conduct difficulties are at increased risk of relationship conflict and involvement in inter-partner violence. Converging evidence already exists to suggest that childhood conduct problems are associated with an increased risk of deviant partner involvement (Ehrensaft et al. 2003; Giordano et al. 1999; Moffitt et al. 2001; Zoccolillo et al. 2004) as well as inter-partner violence in adulthood (Olsen et al. 1999; Webster-Stratton and...
Hammond 1999). For example, Capaldi and Clark (1998) in a sample of 189 high risk young men, found a strong association between the onset of adolescent antisocial behaviors and later violence towards an intimate partner. Similarly, Giordano et al. (1999) found that adolescent aggressive and delinquent behavior was associated with high rates of later adult inter-partner violence (61%) for both males and females. Finally, Ehrensaft and colleagues (2003) found that conduct disordered adolescents tend to behave aggressively toward their partners and to experience high levels of inter-partner violence in adulthood.

b) Young people with conduct problems may also be at increased risk of parenting difficulties such as the use of harsh and physically punitive discipline, inadequate child monitoring and lower levels of parental warmth and affection. Several studies have examined linkages between a history of conduct problems and an individual’s later risk of parenting problems, with almost all based on high risk North American samples (Capaldi et al. 2003; Hops et al. 2003; Serbin et al. 2004; Thornberry et al. 2003; Zoccolillo et al. 2004). For example, a longitudinal study by Lisa Serbin and colleagues (2004), using a community based risk sample of disadvantaged families (The Concordia Longitudinal Study of Quebec school children), investigated lifetime trajectories of highly aggressive girls until young adulthood. In mid-adolescence girls’ aggression was associated with high rates of self reported smoking, alcohol and drug use, elevated rates of gynaecological problems and birth control between 11 and 17 years. Conduct disordered girls were more likely to have sexually transmitted diseases and 48% reported a teen pregnancy. Childhood social withdrawal together with childhood aggressive behaviors was predictive of poorer physical health in adulthood. Similar negative health and behavior patterns were also reported in the offspring of aggressive girls. In general, study findings emphasised that childhood aggressive behavior seemed to predict negative parenting outcomes, including neglect, physical abuse and lack of monitoring. A study by Zoccolillo et al. (2004) also found in a high risk sample of 261
adolescent mothers (the Montreal Adolescent Mother Study), that girls with a history of externalizing problems tended to expose their own children to cigarette smoke and other toxins in utero, to have a preterm delivery, to be less sensitive and more over reactive parents and to show clear signs of neglect and physical punishment towards their children. In addition, Jaffe and colleagues (2006) in their follow-up of a community sample of 246 young New Zealand parents and their 3 year old children (Dunedin study) found that those meeting DSM III criteria for conduct disorder in adolescence were rated by interviewers as being less warm and characterized by lower levels of positive parenting behavior. This global measure of positive parenting behavior assessed the extent to which parents were sensitive, encouraged cognitive stimulation, were unintrusive, engaged, and high in child positive regard.

These findings make considerable theoretical and developmental sense to the extent that measures of childhood conduct problems fundamentally assess impairments in an individual’s relationships with others (Bardone et al. 1996; Capaldi and Stoolmiller 1999; Pajer 1998; Zoccolillo et al. 1992). It is, therefore, not unreasonable to expect that such impairment may carry forward into adulthood in the form of parenting and partnership difficulties (Carlson and Harwood 2003; Jaffe et al. 2006; Quinton et al. 1993; Webster-Stratton 1998). However, most previous studies have been characterized by a number of methodological limitations including: a) the use of high risk selected samples (Capaldi et al. 2003; Hops et al. 2003; Thornberry et al. 2003); b) a reliance on retrospective reports of childhood problems (Doumas et al. 1994; Lackey and Williams 1995; Simons et al. 1995); c) limited consideration of potential confounding factors (Conger et al. 2003; Ehrensaft et al. 2003; Jaffe et al. 2006; Thornberry et al. 2003); and finally d) the assessment of a limited range of parenting outcomes, with most focussing primarily on later risks of harsh and aggressive parenting (Conger et al. 2003; Thornberry et al. 2003) and maternal inconsistency
Early conduct problems and later partnership and parenting risk

(Ehrensaft et al. 2003) or employing broader composite measures of positive and negative parenting (Jaffe et al. 2006).

An ideal research design to address these issues requires the use of a longitudinal research design in which a representative birth cohort of children is studied from birth to adulthood to examine the continuities between childhood conduct problems and subsequent partnership and parenting behaviors. In this paper we use data gathered over the course of a 30 year longitudinal study to examine the following research questions:

a) To what extent are childhood conduct problems, grouped in 4 categories of risk from low to very high, associated with an increased risk of later partner relationship conflicts and parenting difficulties?

b) Can any associations between childhood conduct problems and later outcomes be explained by common confounding factors including maternal educational underachievement, poor family living standards/conditions; family instability, inter-parental conflict, exposure to childhood physical and/or sexual abuse, low cognitive ability or the extent of child attentional problems?

**Method**

**Sample**

Participants were members of an unselected birth cohort that has been extensively studied as part of the XXX (XXX). The XXX is a longitudinal study of 1,265 children born in the XXX (XXX) urban region during mid-1977 and followed until age 30 (XXX et al. 1989; XXX & XXX 2001). Study participants have been assessed at birth, 4 months, 1 year, annual intervals to age 16, and then again at ages 18, 21, 25 and 30. Rates of participation have remained high throughout the study and at age 30, 987 participants (80% of the surviving cohort) were assessed. At age 30, all cohort members who had become biological parents or who were
parenting a non-biological child as a step or foster parent (n = 397) were asked to take part in an additional parenting and family interview. In total, 360 (91%) agreed to participate. Analyses reported in this paper are based on the subsample of 337 cohort members (133 fathers and 204 mothers) who had become parents by age 30 and who were actively involved in making decisions and caring for their children on a resident basis (>2 nights per fortnight). The majority (81.2%) of this sample was Caucasian, with the remainder being of Maori or Pacific Island ethnic identification. With respect to educational level, 75.4% had obtained a high school qualification and 13.3% had a university degree. Eleven parents were involved in their children’s care for only 2 days a fortnight; they were included in the study because they were actively involved in their children’s activities and life (sport or school). However, the results reported here did not change if these 11 participants were excluded from the analysis. The following measures were used in the present analysis.

Childhood Conduct Problems (7-9 years)

When participants were aged 7, 8 and 9 years, parental and teacher reports of the child’s tendencies to disruptive, oppositional and conduct disordered behaviors were obtained using an instrument that combined items from the Rutter (1970) and Conners (1969, 1970) parent and teacher questionnaires. Parental reports were obtained for every child and teacher reports for >98% of the sample studied at each age. The parent scale comprised a total of 21 items and the teacher scale 20 items, with these items spanning a range of behaviors relating to disobedience and defiance of authority fits of temper and irritability, aggression or cruelty towards others, destruction of property, lying, stealing and similar behaviors (Fergusson et al. 1991). Each item was scored on a 3-point scale ranging from not at all (1) to a great deal (3). Confirmatory factor analysis of the selected items for each source (parent, teacher) showed that in each case the items could be scaled as unidimensional scales representing the extent of
conduct problems as reported by parents or teachers (Fergusson et al. 1991). For the purposes of this analysis, scale scores were created by summing the parent and teacher item scores for each child at each age. These scores were then averaged over the three assessments to form a composite measure of the extent of disruptive, oppositional or conduct-disordered behavior during middle childhood. Internal consistency, assessed using coefficient alpha, was high (α=.97). Previous analyses have shown this scale to be predictive of a wide range of adult functional outcomes including, crime, substance use disorders, mental health problems, sexual risk taking and related outcomes (Fergusson et al. 2005).

To simplify presentation, for the purposes of the present analysis cutpoints were placed on the scale to classify the sample into four groups reflecting the severity of childhood conduct problems. These groups were: those with few or no problems whose scores placed them in the bottom 50% of the distribution (Group 1); those whose scores placed them in the 51st to 80th percentiles (Group 2); those whose scores placed them in the 81st to 95th percentiles (Group 3); and those with the highest conduct problems scores who fell into the 96th to 100th percentiles (Group 4). While this classification is arbitrary it should be noted that experimentation with a range of alternative classifications varying the number of groups and the cutpoints on the distribution all produced results that were entirely consistent with the results reported here.

Partner Relations and Parenting Outcomes at Age 30

At age 30, participants were interviewed about the quality of their most recent partner relationship, as well as their care of their children. The following variables were selected for inclusion in this analysis on the basis of previous research and theory linking these partner relationship characteristics and parenting qualities with healthy child development.

*Quality of the Partner Relationship*
Relationship Satisfaction/Investment: This scale provides a measure of the degree to which respondent’s reported feeling attached to their partner and how much they worked at maintaining and improving their relationship ($\alpha = 0.89$). This scale was created by summing items from the Love and the Investment/Maintenance scales from the 25-item Intimate Relations Scale (Braiker and Kelley 1979).

Relationship Ambiguity and Conflict: This scale provide a measure of the extent of inter-partner disagreement and conflict as well as the respondent’s doubts and uncertainties about the relationship ($\alpha = 0.84$). This scale was formed by summing items from the Conflict and the Ambivalence scales from the 25-item Intimate Relations Scale (Braiker and Kelley 1979).

Overall Inter-partner Conflict: A third measure of the quality of partner relations was obtained from the Revised Conflict Tactics Scale (CTS2; Straus et al. 1996). This measure assessed the extent to which participants had been the victim ($\alpha =0.83$) and/or the perpetrator ($\alpha =0.79$) of inter-partner physical and verbal violence in the past 12 months ($r =0.41$, $p=0.001$). For the purpose of this analysis, the two scales were summed to provide an overall measure of the extent of inter-partner violence over this period.

Self Reported Parenting Attitudes and Behaviors

As part of the 30-year parenting and family life interview, all parents were questioned at length about the care of their children. Questioning was based on a series of test items selected from a series of standardized instruments including: the Parenting Practices Questionnaire (Robinson et al. 1995), an adapted version of the Caregiving Questionnaire (Kunce and Shaver 1994), the Child Rearing Practices Report (Dekovic et al. 1991), and the Parenting Scale (Arnold et al. 1993). A set of 36 items was selected to represent the following key domains of parenting and are listed in the online supplement: warmth, sensitivity, over-
reactive behavior and lax/inconsistent discipline. To examine the factorial validity of these data, a series of confirmatory factor models were fitted to the item set. As shown in the online supplementary appendix, these analyses revealed that consistent with the hypothesized domains, the best fitting model was a four factor model, ($\chi^2$ (14) = 18.2, RMSEA= 0.03, SRMR= 0.02, CFI= .99). These factors corresponded to four different, widely accepted, theoretical dimensions (Baumrind 1965, 1966; Carlson and Harwood 2003; Ispa et al. 2004; Richman et al. 1992; Steinberg 2001). A description of each of these dimensional measures is given below. In all cases factor score estimates were scaled to have a mean of 10 and standard deviation of 1.

**Warmth:** This scale provided a measure of parental positive regard, encouragement and affection towards children. The scale comprised a total of 13 items reflecting the extent to which parents enjoyed spending time together with their children joking and playing, expressing affectionate care by hugging, kissing or holding their children.(see list of items in the online appendix) ($\alpha = .84$).

**Sensitivity:** This scale comprised 6 items reflecting the extent to which parents were able to recognize and respond appropriately to their child’s needs and cues. In general, it provides an index of responsiveness attesting parental ability to recognize child signals and answer in an appropriate way (see list of items in the online appendix) ($\alpha = .70$).

**Over Reactive Child Management:** The scale comprised 10 items reflecting the extent to which parents reported engaging in negative and reactive parenting strategies such as responding with anger, irritation, and/or the use of bad language (see list of items in the online appendix) ($\alpha = .82$).

**Lax and Inconsistent Discipline:** This 7 item scale provided a measure of lax and permissive parenting, including failing to contain child behavior, parental inconsistency, limited parental guidance and low levels of child engagement. Higher scores reflected higher
levels of parental inconsistency and inadequate guidance (see list of items in the online appendix) \( (\alpha = .76) \).

Finally, a self-report measure of the extent to which parents used physical punishment in the management of child behavior was obtained using the Parent–Child Conflict Tactics Scale (CTS-PC; Straus et al. 1998). The 12 items from the physical assault subscales of the CTS-PC were used to provide a measure of the number of different types of child physical punishment methods used by parents over the last 12 months. These ranged from minor assault (for example, smacked on bottom with bare hand) through to the use of very severe forms of physical assault (for example, hit child over and over as hard as could). The CTS-PC represents one of the most widely used measures of parent-child aggression and has been shown to be reliable and valid (Straus and Hamby 1997).

Interviewer Observational Ratings of Parenting Behavior

Interviewer observational ratings were based on a trained interviewer’s direct observation of the home environment and the parent’s interaction with their child(ren). Immediately after their home visit, interviewers completed a series of 5-point global ratings of the extent of observed parental warmth, sensitivity and the quality of child behavior management during the visit. All interviewers received training and ongoing supervision by senior staff in their scoring of these scales. Previous research has shown that these scales are effective in discriminating between parents of children with and without behavior problems (Woodward et al. 1998) and that they correlate well with observational measures of parenting behavior (Dowdney et al. 1984). The Warmth scale assessed a parent’s display of affection and enjoyment of their children. Sensitivity assessed the extent to which a parent recognised and responded to a child’s worries and concerns, modified their behavior in response to a child’s needs, and helped the child to anticipate and confront problematic situations. Child
management assessed the extent to which a parent monitored their child’s behavior and made use of effective child management strategies. The correlations between self-report and these interviewer rated measures of warmth, sensitivity and child discipline/management ranged between -.30 to .53 (see online appendix).

Covariate Factors

Previous research has suggested a significant association between antisocial behaviors in children and the following factors: low socioeconomic status (SES); high levels of negative life stress; parental history of abusive backgrounds, criminal activity, substance abuse, and psychiatric illness; and high levels of marital discord, depression, parent isolation, and lack of support (Farrington 1992; Offord et al. 1986). Furthermore, previous study findings already demonstrated a clear association between the extents of childhood conduct problems (7-9) and a series of factors spanning: family socio-economic disadvantage; family instability and conflict; parental adjustment and child physical and/or sexual abuse; and child individual characteristics (XXX 2005). Therefore, to assess the extent to which associations between early conduct problems and later outcomes could potentially be explained by the effects of confounding factors associated with early familial and individual disadvantages, the following variables were included in the analyses.

*Childhood Social Background*

Four measures of family social background were included. First, *maternal age* was assessed in whole years at the time of the cohort member’s birth. Second, *maternal education* at birth was assessed using a 3-point scale that reflected the mother’s highest level of educational attainment. The third and fourth measures related to the family’s socioeconomic status and living standards. *Family socioeconomic status* was assessed at the time of the surveyed
child’s birth using the Elley-Irving scale (Elley and Irving 1976). *Family living standards* were assessed annually from birth to 10 years on the basis of interviewer observations of family accommodation and living conditions on a 5-point scale ranging from 1 (very good) to 5 (very poor). These ratings were then averaged to form a composite measure of family living standards.

*Childhood Family Functioning*

Four measures of family functioning during the respondent’s own childhood were included. First, the respondent’s exposure to parental instability and change was assessed by summing the total number of parent figure changes from birth to age 15. Second, a measure of the extent to which sample members had been raised in families characterized by inter-partner conflict was created using 3 items describing the quality of marital relationship in the past 12 months. These questions were asked annually from birth until age 10, and included (a) whether the parents had engaged in prolonged arguments, (b) whether the child’s mother reported an assault by partner and (c) whether the child’s mother reported experiences of sexual difficulties. These items were then summed to create a scale measure of inter-parental conflict during the first 10 years of the cohort member’s life (Fergusson et al. 1992). The third measure assessed the mental health of the respondent’s parents, and consisted of a composite score of the extent to which their own parents had reported having a history of depression/anxiety, alcohol problems, criminality and illicit drug use when participants were mid-adolescents. Finally, the fourth measure assessed the extent to which each respondent had been subject to physical punishment and/or sexual abuse before the age of 16 years. This was assessed retrospectively at ages 18 and 21 years. Based on this questioning, respondents were classified as follows (0= no physical and/or sexual abuse and 1=presence of physical and/or sexual abuse).
**Childhood Individual Characteristics**

These measures included gender, childhood cognitive ability, emotional and attention problems. Cognitive ability was assessed at age 8-9 using the revised Wechsler Intelligence Scale for Children (Wechsler 1974). Childhood anxiety and withdrawal problems at age 7-9 and childhood attention problems at age 7-9, both collected using items from the Rutter (1979) and Conners (1970) questionnaires as reported from parents and teachers (Fergusson and Horwood 1993; Fergusson et al. 1991).

**Statistical Methods**

Bivariate Associations: Associations between childhood conduct problems (ages 7-9) classified into four levels of severity and later partnership and parenting outcomes (Table 1) were tested for statistical significance using analysis of variance - one way ANOVA- with tests for linear trend. In all cases there was evidence of a significant linear association. No significant non-linear trends were found.

Identification of Confounding Factors: Associations between early conduct problems and a wide range of confounding factors (Table 2) were tested for significance using the Mantel-Haenszel chi square test for linear trend for dichotomous outcomes, and analysis of variance - one way ANOVA- with tests for linear trend for continuous outcomes.

Adjustment for Confounding Factors (Table 3): Each significant association in Table 1 was adjusted for the confounding factors in Table 2, by fitting the following linear model:

\[ Y_i = B_0 + B_1 X_i + \sum B_j Z_{ij} + U_i \]

where \( Y_i \) was the outcome for participant \( i \), \( X_i \) was the corresponding measure of conduct problems classified in four levels and \( Z_{ij} \) were the set of confounders. The coefficient \( B_1 \) measures the effect of a unit change in \( X \) on the outcome \( Y \) net of the confounders \( Z_j \). To avoid problems related to statistical over control of
confounding, resulting from the inclusion of multiple non-significant covariates in the fitted models, model fitting was conducted using both forwards and backwards methods of variable selection to identify a stable set of significant covariates for each outcome. (However, solutions using the full set or selected set of significant covariates led to similar conclusions.)

Estimates of Effect Size: For each model reported in Table 3 (panel b) an estimate of the effect size of childhood conduct problems on later outcome after adjustment for confounding was obtained from comparison of the adjusted $R^2$ statistic for the fitted regression model with an alternative model in which the outcome was regressed on the covariates alone without childhood conduct problems. This provided a measure of the change in $R^2$ attributable to childhood conduct problems and may be interpreted as the percentage variance explained in the outcome by childhood conduct problems after adjustment for confounding.

Multivariate Regression Model: To test the joint significance of the effects of childhood conduct problems on a) measures of the partnership outcomes, and b) measures of parenting, a multivariate regression model was fitted to the data in which all outcomes were simultaneously regressed on conduct problems and confounding factors, while permitting the outcome measures to be correlated. Chi squared tests of the null hypotheses that all effects of conduct problems on each set of outcomes (partnership, parenting) were jointly zero were derived from comparison of the chi squared goodness of fit statistics for the model that included effects for conduct problems compared to an alternative model in which these effects had been constrained to zero. Model fitting was conducted using Mplus (Muthen and Muthen 2007).

Adjustment for Sample Selection Bias: Table 3 (panel c) shows the effect of conduct problems from the fitted regression models controlling for both confounding factors and selection bias. Control for selection bias was achieved by the use of a Heckman correction.
(Heckman 1979). This correction involved: i) computing a sample selection hazard score $\lambda$ for each respondent with this hazard $\lambda$ representing their probability of being included in the sample under study. The predictors used in the calculation of the hazard included measures assessed at birth for the entire cohort. Significant predictors included: maternal age at first birth ($p < .0001$), maternal education ($p < .0001$), gender ($p < .0001$), SES ($p=.029$); ii) the estimated hazard $\lambda$ for each respondent was then incorporated into the regression models in Table 3 to control for selection bias.

Gender Interactions: To assess the possibility that there may be gender differences in the relationship between child conduct problems and later partnership and parenting outcomes, the linear regression models in Table 3 were extended to test for possible gender x child conduct problems interactions.

**Results**

Early Conduct Problems and Adult Partnership and Parenting Outcomes by age 30

Table 1 shows the cohort classified into four groups according to the severity of childhood conduct problems that were reported by parents and teachers between the ages of 7 and 9 years. These groups ranged from those cohort members whose scores placed them in the least disturbed 50% of the cohort to those whose conduct problems score placed them in the most disturbed 5% of the cohort. For each group, Table 1 describes the quality of the respondents’ current or most recent adult partner relationship, as well as their parenting attitudes and behavior towards their children at age 30. Measures of partner relationship quality included the respondent’s perceived relationship satisfaction and investment, the degree of reported relationship conflict and ambiguity, as well as the extent of overall inter-partner conflict. Measures of parenting outcomes included parent reported and interviewer reported level of
warmth and sensitivity, the interview rated quality of child management, parental self-reported inconsistent discipline, over reactivity and their use of child physical punishment.

**INSERT TABLE 1 HERE**

The unadjusted associations in Table 1 show the presence of significant linear associations between the severity of childhood conduct problems between the ages of 7 and 9 years and later adverse partnership and parenting outcomes by age 30. Specifically:

a) Partnership outcomes: as the severity of childhood conduct problems increased there was a corresponding decline in respondent’s perceived relationship satisfaction and investment \((p = .005)\), increases in levels of relationship ambivalence and conflict \((p = .015)\) and higher levels of inter-partner violence \((p < .0001)\).

b) Parenting outcomes: as the severity of childhood conduct problems increased there were also corresponding declines in both interviewer observed \((p < .0001)\) and self-reported levels of warmth \((p = .001)\) and sensitivity \((p = .001)\) towards children in their care during adulthood. Earlier conduct problems were also associated with higher levels of self-reported over reactivity \((p = .001)\), and lower levels of interviewer assessed effective child management \((p < .0001)\). Parents with more severe childhood conduct problems also reported higher levels of child physical punishment \((p = .003)\) and lax/inconsistent parental guidance \((p = .01)\).

**INSERT TABLE 2 HERE**

Child and Family Factors Associated with the Severity of Childhood Conduct Problems

The results in Table 1 suggest that childhood conduct problems may place young people at an elevated risk of later adult partnership and parenting difficulties. However, it could also be suggested that these associations may reflect the effects of confounding factors that are
correlated with both a) early conduct problems and b) later partnership and parenting problems. To examine this issue, Table 2 presents a descriptive profile of the socio-familial backgrounds and childhood characteristics of individuals in the four conduct problem groups. Social background factors included the age of the respondent’s own mother at the time of first child birth, maternal education, family socio-economic (SES) level and family standard of living. Family of origin factors included measures of family instability, inter-parental conflict, and exposure to parental psychopathology. Individual childhood characteristics included gender, IQ, concurrent attention and emotional problems.

Table 2 shows that children identified as having higher levels of conduct problems were significantly more likely to have been raised in families characterised by early motherhood (p=.001), maternal educational underachievement (p=.004) and poorer living standards (p=.001). In addition, increasing severity of childhood conduct problems was associated with higher rates of inter-parental conflict (p=.001), family instability (p <.0001), childhood physical/sexual abuse (p=.003) and parental adjustment problems (p=.002) in their family of origin. Finally, these results also show that young people with a history of childhood conduct problems tended to have lower intellectual ability (p <.0001) and higher mean levels of comorbid anxiety and attentional problems (p <.0001). Collectively, these results indicate that cohort members who had higher levels of childhood conduct problems were more likely to have been raised in adverse family circumstances and to have personal characteristics that could also influence their later life course outcomes, particularly in the domains of partner and parent-child relations.

INSERT TABLE 3 HERE

Adjustment for Covariate Factors
To examine the extent to which the significant associations reported in Table 1 between the extent of early conduct problems and later partnership and parenting outcomes could be explained by the confounding effects of social, family and individual factors correlated with childhood conduct problems, a series of regression analyses were undertaken. For each outcome, regression models were fitted to estimate the association between early conduct problems and later outcome after taking into account, statistically, the effects of potential confounding factors identified in Table 2 (see Statistical Methods section). The results of these analyses are summarized in the middle column of Table 3 (panel b), which gives the regression coefficients, standard errors and *p* values for the adjusted associations between the severity of childhood conduct problems and each of the dependent variables. Also listed are the covariate factors found to be significant for each outcome. For comparative purposes the left hand column of the Table (panel a) also reports the unadjusted regression coefficients derived from regressing each outcome on conduct problems alone.

With respect to relationship satisfaction and investment and overall inter-partner conflict, statistical control for the effects of confounding factors had almost no impact, with these associations remaining statistically significant after adjustment. However, for relationship ambiguity/conflict, adjustment for confounding reduced the association to marginal significance (*p* = .07). After adjustment for confounding, childhood conduct problems explained between 1% to 4% of the variance in partnership outcomes.

With respect to parenting outcomes, despite a small attenuation, almost all associations remained significant after covariate adjustment. Specifically, the strength of the associations between early conduct problems and later self-reported warmth, sensitivity, overreactivity and physical punishment remained strongly significant. Consistent with this, associations between childhood conduct problems and later interviewer rated parental warmth, sensitivity and child management effectiveness also persisted. The one exception to
this pattern of findings was the association between childhood conduct problems and later
lax/inconsistent parenting behavior which was reduced to statistical non significance (p =
.11). After adjustment for confounding childhood conduct problems explained between 1%
and 14% of the variance in parenting outcomes.

The above results were based on a series of univariate regression models in which
each outcome was regressed separately on childhood conduct problems and confounding
factors. However, this approach failed to take into account the fact that the outcome measures
were correlated. To address this issue, the data were reanalysed using a multivariate
regression modelling approach in which all outcomes were simultaneously regressed on
childhood conduct problems and covariate factors, while permitting all outcomes to be
correlated. This model was used to derive joint tests of the overall significance of the effects
of childhood conduct problems on a) partnership outcomes and b) parenting outcomes (see
Statistical Methods). In both cases these tests were highly significant: for partnership
outcomes ($\chi^2 (3) = 15.0; p=.002$) and for parenting outcomes ($\chi^2 (8) = 28.4; p<.0001$). This
confirms the impressions from Table 3 that for this sample childhood conduct problems
appeared to have pervasive consequences for a wide range of later parenting and partnership
outcomes.

The Role of the Sample Selection Bias

One limitation of the results shown in Table 3 is that they are based on a selected sample of
the 337 cohort members from the XXX who had become parents by age 30. The use of this
selected sample raises issues about the effects of sample selection processes on the validity
and the generalizability of our findings. Such processes might include the normal processes
leading to sample attrition and missing data in the context of a longitudinal study, as well as
processes relating to an earlier timing of entry into parenthood in this sample compared to
other cohort members. To address this issue the results were adjusted for sample selection bias by using a Heckman correction (Heckman 1979) as described in the Statistical Methods section. Comparison of results, before and after adjustment for sample selection hazard scores (Table 3 - panel c) shows that the conclusions drawn from both set of findings were very similar; thus suggesting that sample selection bias was unlikely to have influenced study findings.

The Role of Gender

To test whether associations between childhood conduct problems and later partnership and parenting outcomes varied for males and females, regression models were extended to test for possible childhood conduct problems x gender interactions after confounding factors and selection bias were taken into account. These analyses revealed significant interactions for interviewer rated parental sensitivity (p=.05) and parents’ reported use of physical punishment (p=.03). These interactions suggested that the association between childhood conduct problems and interviewer reports of parental sensitivity was stronger for males than for females, whereas the association between childhood conduct problems and parental reports of physical punishment was stronger for females than for males. However, given the number of interaction tests conducted it is quite possible that these significant interactions could simply have been due to chance as a result of multiple significance testing. To address this issue a Bonferroni correction was applied with the adjusted p-value calculated to take into account the size of the average correlation between the outcomes (Abdi 2007). Neither interaction was significant using the adjusted p-value of .007. These findings are consistent with the conclusion that, in general, the associations between childhood conduct problems and later partnership/parenting outcomes were similar for males and females.

Discussion
In this paper we have used data gathered from a longitudinal study of a XXX birth cohort to examine the extent to which childhood conduct problems, assessed at 7-9 years, were associated with increased risks of adverse partner relationship and parenting outcomes in adulthood (30 years). The findings showed that children with early conduct problems had: a) increased levels of partnership problems and difficulties including: relationship ambiguity, inter-partner conflict and reduced relationship satisfaction; and b) increased levels of parenting problems including: the use of over-reactive and physically punitive discipline methods, reduced levels of parental warmth and sensitivity, and less effective child management strategies. This parenting profile was consistent across both self-report and interviewer ratings. Associations between childhood conduct problems and later partnership and parenting difficulties were largely the same for both males and females. Variations in childhood conduct problems explained between 1% to 14% of the variance in adult outcomes.

Consistent with previous research (Fergusson et al. 2005; Jaffe et al. 2006; Moffitt et al. 2002), findings from this study suggest that as the severity of childhood conduct problems increased there were corresponding increases in an individual’s later risks of involvement in a partner relationship characterized by high levels of inter-partner conflict and violence. In particular, children who scored in the 5% most disturbed group were more likely than children in the least disturbed group to report high levels of relationship ambiguity and inter-partner conflict, as well as lower satisfaction and investment in their relationship.

With respect to parenting outcomes of individuals with a childhood history of conduct problems, our findings are in line with previous research (Capaldi et al. 2003; Jaffe et al. 2006; Serbin et al. 2004) and suggest that those in the most disturbed group are at increased risk to becoming less sensitive and warm parents and are more likely to use physical punishment, over reactive child management behavior and lax/inconsistent discipline.
The present study had a number of strengths including: the longitudinal design; the use of a community based sample of males and females; repeated long term follow up of the cohort; the multi-informant approach; the examination of a range of specific partnership and parenting outcomes; and the inclusion of a wide range of relevant individual and familial confounding factors. These strengths address limitations of previous research (Conger et al. 2003; Hops et al. 2003; Jaffe et al. 2006; Thornberry et al. 2003), and bring additional evidence to bear on the relationship between childhood conduct problems and later family functioning, especially child rearing practices in adulthood.

A further implication of this study concerns the role of potential confounding factors in the association between childhood conduct problems and later partnership/parenting outcomes. A strength of the present study was the availability of a wide range of confounding factors assessed across the life course. These factors included three main domains: i) childhood social background (maternal age at birth and education, family income and standard living condition), ii) childhood familial functioning (parental instability and inter-partner conflicts, parental history of depression, anxiety, alcohol problems, illicit drug use and criminal behaviors, exposure to childhood physical and/or sexual abuse), and iii) childhood individual characteristics (IQ, childhood anxiety and withdrawal, attention problems and child gender). In general, the results of the analyses did not suggest these factors played a strong role in confounding the association between early conduct problems and later partnership/parenting outcomes. As a general rule, the results before and after adjustment for confounding were similar.

These findings add to a growing body of research into the long term consequences of conduct problems in middle childhood for later psycho-social adjustment. Specifically, previous studies of this cohort have shown that children with elevated levels of conduct problems in middle childhood were at increased risk of later crime, mental health problems,
suicidal behaviors, substance use, teen pregnancy and early parenthood (XXX 2005). The present study extends these results by showing that similar increases are evident for both parenting behaviors and partner relationships. Collectively, the findings of this study show the importance of early intervention to address childhood conduct problems. There are now a range of effective family based and school based interventions designed for children in early and middle childhood. These interventions include: parent behavior management training (Kadzin 1997; Kadzin et al. 1992), teacher behavior management training (Hutchings et al. 2007), school-wide positive behavior support (Sugai and Horner 2006) and multi-dimensional treatment foster care (Chamberlain et al. 2008).

However, the findings and the implications of this study should be considered alongside the following limitations. First, because we used self-report measures to assess partnership and parental dimensions, it could be argued that results may reflect subjective biases and reporting errors. Nevertheless, the use of different informants (parents/interviewers) overcomes the limitation of relying only on single informant reports. Also, these findings apply to a specific cohort of XXX, thus further replications will need to address the extent to which these results could be generalized to other cohorts and cultures. Within these limitations, findings of this 30-year longitudinal cohort study do confirm that children with high conduct problems are an “at-risk” population for later dysfunctional partner relationships and parenting difficulties.
Early conduct problems and later partnership and parenting risk

References


Early conduct problems and later partnership and parenting risk


