

Childhood Physical Punishment or Maltreatment and Partnership Outcomes at Age 30

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Introduction

A large number of studies have considered the associations between exposure to childhood physical abuse and psycho-social outcomes in later life. There is now robust evidence to show that exposure to childhood physical abuse is associated with a wide range of adverse outcomes in later life including increased rates of: diagnosed illness (Springer, Sheridan, Kuo, & Carnes, 2007); mental health problems including suicidal behaviors (Kaplan, Pelcovitz, & Labruna, 1999; Mironova et al., 2011; Mullen, Martin, Anderson, Romans, & Herbison, 1996; Springer, et al., 2007; Stevenson, 1999; Sugaya et al., 2012); substance misuse (Carlson, Shafer, & Duffee, 2010; Simpson & Miller, 2002); and educational under-achievement (Eckenrode, Laird, & Doris, 1993; Perez & Spatz Widom, 1994).

An issue to which less attention has been given, has been on the effects of exposure to childhood physical abuse and subsequent partnership outcomes. In particular, it could be hypothesized that childhood physical abuse may lead to an impaired ability to form interpersonal relationships (Larsen, Sandberg, Harper, & Bean, 2011; Whitfield, Anda, Dube, & Felitti, 2003). Consequently, this may lead to the formation of unsatisfactory partnerships in adulthood, with these partnerships being subject to: greater partnership change; higher rates of partner dissatisfaction; and higher rates of partner conflict and intimate partner violence (IPV).

There is already some evidence to support this hypothesis. Specifically, Larsen, Sandberg, Harper and Bean (2011), examined the relationship between childhood physical abuse and partner relationship quality in a sample of 634 clients of a family therapy center. The findings of this study showed that individuals exposed to childhood physical abuse were at increased risks of impaired or poor partner relationships. Other studies have reported similar findings suggesting that exposure to childhood physical child abuse is associated with impaired partner relationships in adulthood including: higher rates of IPV (Desai, Arias, Thompson, & Basile, 2002; Herrenkohl et al., 2004; McKinney, Caetano, Ramisetty-Mikler, & Nelson, 2009; Swogger, Walsh, Kosson, Cashman-Brown, &

Caine, 2012; Whitfield, et al., 2003); more frequent divorce and separation (Colman & Spatz Widom, 2004; Mullen, et al., 1996); and reductions in the quality of partner relationships (Colman & Spatz Widom, 2004; Larsen, et al., 2011; Mullen, et al., 1996).

While there is increasing evidence to suggest that exposure to childhood physical abuse is associated with later impaired partner relationships, this evidence is limited in a number of ways. First, the majority of studies are cross-sectional in nature (Desai, et al., 2002; Larsen, et al., 2011; McKinney, et al., 2009; Mullen, et al., 1996; Swogger, et al., 2012; Whitfield, et al., 2003); and of the two longitudinal studies (Colman & Spatz Widom, 2004; Herrenkohl, et al., 2004) neither was based on a representative sample or had prospectively assessed partnership outcomes over time.

Second, studies have considered a limited range of measures of the nature and quality of partner relations (Davis, Petretie-Jackson, & Ting, 2001; Larsen, et al., 2011).

The third issue concerns the control of confounding. Specifically, it may be suggested that the apparent association between childhood physical abuse and partnership outcomes reflects the association between childhood physical abuse and other childhood factors. For this reason, it is important to adjust the associations between childhood physical abuse and partnership outcomes for the effects of known covariates (Springer, et al., 2007).

A fourth issue in this area concerns the extent that gender modifies the association between childhood physical abuse and partnership outcomes. Specifically, it could be suggested that the effects of exposure to child abuse on partnership outcomes may vary with gender. However, studies have varied in their findings on the extent to which gender modifies the associations between childhood physical abuse and later partnership outcomes. Some studies have found the effects of childhood physical abuse on later relationships to be more marked for males (e.g. Herrenkohl, et al., 2004; McKinney, et al., 2009; Whitfield, et al., 2003), whereas others have found that the effects of childhood physical abuse on later relationships are similar for males and females (Desai, et al., 2002; Larsen, et al., 2011).

A more general issue concerns methods for assessing child maltreatment, with the majority of studies in this area being based upon retrospective reports about childhood. This method has been criticized on the grounds that it may be subject to errors of reminiscence including forgetting and recall biases (Gilbert et al., 2009; Spatz Widom & Morris, 1997; Spatz Widom & Shepard, 1996). Some researchers in this area have recommended that studies should be conducted using samples of children coming to official attention for child maltreatment (Spatz Widom & Morris, 1997; Spatz Widom & Shepard, 1996). However, children coming to official attention for child maltreatment are unlikely to be representative of all children subject to child maltreatment; potentially introducing sample selection biases.

An alternate approach suggested by Fergusson, Horwood and Boden (2011) is to use repeated retrospective reports of child maltreatment to estimate the effects of current mental state on the reporting of child maltreatment. These authors showed how the availability of repeated measures of retrospectively reported child maltreatment and mental state, made it possible to estimate the effects of current mental state on the reporting of child maltreatment. Their findings showed that the effects of current mental state on the reporting of both childhood sexual abuse and physical abuse were negligible, suggesting that concerns about recall bias in retrospective reports may have been overstated.

Against this background, this paper presents the results of a 30-year longitudinal study of the associations between reported exposure to childhood physical punishment/maltreatment and subsequent partnership outcomes in adolescence and adulthood in a New Zealand birth cohort. The aims of this study were:

(1) To document the associations between reported exposure to childhood physical punishment/maltreatment and later partnership outcomes including: the number of cohabiting partnerships by age 30; and measures of partnership satisfaction and quality; IPV victimization and IPV perpetration at age 30.

(2) To adjust the associations between exposure to childhood physical punishment/maltreatment and partnership outcomes for a wide range of prospectively gathered childhood social, family and related confounding variables.

(3) To examine the extent to which associations between childhood physical punishment/maltreatment and later partnership outcomes varied with gender.

This research design has several advantages over previous research in this area: a) the study is based on a well-studied birth cohort; b) childhood physical punishment/ maltreatment was assessed using repeated retrospective reports; c) the study has measured a comprehensive set of partnership outcomes; and d) the study includes a wide range of theoretically relevant prospectively measured confounding factors.

Methods

Participants

Participants were members of a birth cohort that has been studied extensively as part of the Christchurch Health and Development Study (CHDS). The CHDS is a longitudinal study of 1,265 children (630 females) born in the Christchurch (New Zealand) urban region over a 4-month period during 1977. This cohort has been studied at regular intervals from birth until age 30 (for details see Fergusson & Horwood, 2001). All phases of the study have been subject to ethical approval by the Canterbury Regional Health and Disabilities Ethics Committee. All data collection was conducted with the signed consent of the study participants.

At age thirty, 987 (80%) of the surviving cohort members were interviewed. The sample consisted of: 52% females; 86% European ethnicity with the remainder reporting New Zealand Māori/Pacific Island ethnicity; 10% had no educational qualifications; 23% had a high school qualification only; 37% had a tertiary qualification below degree-level; and 30% had attained a tertiary-level degree.

Measures

The following measures were selected for inclusion in this analysis.

Exposure to childhood physical punishment/maltreatment. At ages 18 and 21, cohort members reported on the extent to which their parents used physical punishment/maltreatment during their childhood (prior to age 16 years). These ratings were then combined into a single 4-point scale of parental physical punishment/maltreatment, based on the most severe rating at either the 18- or 21-year interview: (1) parents never used physical punishment (4.5% of the sample); (2) parents seldom used physical punishment (78.0% of the sample); (3) at least one parent regularly used physical punishment (11.2% of the sample); (4) at least one parent used frequent or severe punishment or treated the participant in a harsh/abusive manner (6.4% of the sample) (Fergusson & Lynskey, 1997).

The validity of this method of assessment of childhood physical punishment/maltreatment has been addressed in a previous paper which used methods of structural equation modeling to examine the extent to which retrospective reports of childhood physical punishment/maltreatment were affected by current mental state (Fergusson, et al., 2011). The findings of this analysis showed that while childhood punishment/maltreatment was related to mental health, current mental health did not contaminate the reports of childhood punishment/maltreatment. These findings are consistent with the conclusion that the repeated retrospective reporting of childhood punishment/maltreatment was not influenced by recall biases.

Partnership outcomes to age 30. Partnership outcomes to age 30 were assessed using the measures described below:

Cohabitation history 16-30 years

Cohabitation history was based on the count of the number of cohabiting/marriage relationships described by the study participant in interviews at 16, 18, 21, 25 and 30 years.

Partner relationships 29-30 years

Participants who reported having been in a romantic relationship lasting one month or longer at any time in the past 12-months (29-30 years), were questioned about the following aspects of that relationship:

a) Relationship quality. At the 30 year assessment, partner relationships were assessed using the 25-item Intimate Relations Scale (Braiker & Kelley, 1979). This scale measured two dimensions: positive partner relations (love and investment) and negative partner relations (ambiguity and conflict). Participants responded to each item using a 3-point scale (1=does not apply; 2=applies somewhat; 3=definitely applies) and test scores for each dimension were constructed from an unweighted sum of the test items. Internal reliability for both indices was good (positive partner relations $\alpha=0.89$; negative partner relations $\alpha=0.84$).

b) Partner social adjustment score. At the 30 year assessment, participants were assessed using a 9-item questionnaire examining their romantic partners' social adjustment (sample items included: My partner has a lot of personal problems; My partner does things that are against the law such as stealing or vandalism; My partner has problems due to the use of alcohol). An overall score representing the extent of partner social adjustment was created by summing the nine items. The internal reliability of this scale was modest but acceptable ($\alpha=0.70$).

Intimate partner violence 29-30 years

At the 30 year assessment, IPV was assessed with the Revised Conflict Tactics Scale (CTS2: Straus, Hamby, Boney-McCoy, & Sugarman, 1996). Using this measure, two scale scores representing the degree of IPV victimization and perpetration in the past 12 months, were constructed. These scales were based on a series of 18 questions regarding the respondent's exposure to, or perpetration of, acts of physical violence or threats. The internal consistency of these scales was good (victimization $\alpha=0.85$; perpetration $\alpha=0.79$).

The assessment of cohabitation history was based on a sample of 984 participants studied to age 30. The assessment of partner relationships and IPV was based on reports from 875 respondents who were in partnerships at 29-30 years.

Covariate factors. To assess the extent to which associations between childhood physical punishment/maltreatment and partnership outcomes to age 30 were subject to confounding, a detailed investigation of the CHDS database was conducted to identify the childhood correlates of childhood physical punishment/maltreatment. The findings of this section are summarized in Table 2 which shows that childhood physical punishment/maltreatment was associated with a wide range of prospectively collected measures including: sociodemographic background at birth, family functioning and childhood history of sexual abuse.

Sociodemographic background at birth

Maternal age. Maternal age at first birth was assessed in whole years at the time of the cohort member's birth.

Family situation at birth. Whether the child entered a single-parent or two-parent family.

Family socioeconomic-status. Family socioeconomic-status at the time of the child's birth was assessed using the Elley and Irving (1976) scale of socioeconomic-status for New Zealand. This index ranks families into six levels on the basis of paternal occupation. For this analysis, the scale was collapsed into three levels as follows: 1- Levels 1,2 (professional, managerial); 2-Levels 3,4 (clerical, technical, skilled), 3-Levels 5,6 (semi-skilled, unskilled, unemployed).

Maternal education. This was assessed at the time of the child's birth using a 3-point scale that reflected the mother's highest level of educational attainment. This scale was: 1- mother lacked educational qualifications; 2- mother had secondary (high school) qualifications; and 3- mother had tertiary (college) qualifications.

Paternal education. This was assessed at the time of the child's birth using a 3-point scale that reflected the father's highest level of educational attainment. This scale was: 1- father lacked

educational qualifications; 2- father had secondary (high school) qualifications; and 3- father had tertiary (college) qualifications.

Family living standards (0–10 years). Interviewer ratings of family living standards were obtained at every year from 1 year to 10 years. In these ratings, the family's living standards were assessed on a 5-point scale that ranged from very good to very poor. To create an overall scale score, these ratings were summed over the 10-year period and averaged to obtain an assessment of family living standards during childhood.

Family functioning

Changes of parents (0–16 years). Comprehensive data on the child's family placement and changes of parents were collected at annual intervals from birth to age 16 years. To assess the extent of parental change, a measure of the child's exposure to parental change was constructed by counting the number of changes of parent(s) from birth to 16 years.

Parental adjustment problems. At age 15, the child's parent(s) were questioned about any history of depression or anxiety, alcohol problems, and any history of criminal offending. Three variables were constructed representing whether or not participants' parents reported: a history of depression or anxiety, a history of alcohol problems, or a history of criminal offending.

Interparental violence. The experience of interparental violence during childhood (prior to age 16 years) was assessed via participant self-report at age 18, through a series of eight items derived from the Conflict Tactics Scale (Straus, 1979). The eight items used included: (1) threaten to hit or throw something; (2) push, grab or shove other parent; (3) slap, hit or punch other parent; (4) throw, hit, kick or smash something (in the other parent's presence); (5) kick the other parent; (6) choke or strangle other parent; (7) threaten other parent with a knife, gun or other weapon; (8) call other parent names or criticize other parent (or put other parent down). An overall measure was created by summing the responses for both father- and mother-initiated violence ($\alpha = 0.88$).

Childhood exposure to sexual abuse. At ages 18 and 21, cohort members were questioned about their exposure to any forms of childhood sexual abuse prior to age 16, including: (1) non-contact episodes involving indecent exposure, public masturbation or unwanted sexual propositions; (2) episodes involving sexual contact in the form of sexual fondling, genital contact or attempts to undress the respondent; and (3) episodes involving attempted or completed vaginal, oral or anal intercourse (Fergusson, Horwood, & Lynskey, 1996; Fergusson, Lynskey, & Horwood, 1996). Based upon the most severe form of childhood sexual abuse reported at either time-point, cohort members were classified into a single four-point categorical variable (from least to most severe) based on their level of childhood sexual abuse exposure: no childhood sexual abuse (85.9% of the sample), non-contact childhood sexual abuse (2.7%), contact childhood sexual abuse not involving attempted or completed sexual penetration (5.1%), and severe childhood sexual abuse involving attempted or completed sexual penetration including vaginal, oral and anal intercourse (6.3% of the sample). A previous analysis of this repeated-measures childhood sexual abuse data revealed that the reports of childhood sexual abuse exposure were not influenced by current mental state assessments and the combined measure had good predictive validity (Fergusson, et al., 2011; Fergusson, Horwood, & Woodward, 2000).

Statistical analysis

In the first phase of the analysis, the bivariate associations between the extent of childhood physical punishment/maltreatment and the outcome measures were tested for statistical significance using by fitting generalized linear regression models in which the outcome was modeled as a linear function of the extent of physical punishment/maltreatment. These models differed in the link function used: a) for the number of cohabiting partners Poisson was used; b) for positive partner relationships, negative partner relationships and partner social adjustment problems least squares regression was used; and c) for measures of IPV (victimization/perpetration) negative binomial

regression was used to correct for over dispersion. In all cases a linear model was found to be adequate.

The analysis was extended to consider possible confounding by a series of childhood social, family and related factors (0–16). Table 2 shows the associations between each of these factors and exposure to childhood physical punishment/maltreatment. For simplicity of presentation, the confounding factors were dichotomized and the association between childhood physical punishment/maltreatment and each factor was tested for significance using the Mantel-Haenszel chi-square test for linearity.

Control for confounding was achieved by fitting regression models to each outcome including childhood physical punishment/maltreatment exposure and covariate factors to estimate the covariate adjusted associations between childhood physical punishment/maltreatment and each partnership outcome (Table 3).

To test for gender differences in the strength of association between childhood physical punishment/maltreatment and each partnership outcome, a linear childhood physical punishment/maltreatment by gender interaction was included in each regression model. This interaction tested the equality of the slopes between the extent of childhood physical punishment/maltreatment and each outcome for males and females.

Sample size and sample bias

Sample size. The analyses were based upon a sample of 984 respondents with complete data on childhood physical punishment/maltreatment and partnership outcomes up to age 30. This sample represented 80% of the CHDS cohort surviving to the age of 30.

The following samples were used in the analyses:

1. The analysis of childhood physical punishment/maltreatment and the number of cohabiting partners was based on a sample of 984 respondents with complete data on childhood physical punishment/maltreatment and cohabitation history (16-30 years).

2. The analysis of childhood physical punishment/maltreatment and both partner relations and IPV at age 30 was based on a sub-sample of 875 study participants who were in a partner relationship during the period 29-30 years. The numbers in these analyses vary slightly due to small amounts of missing data.

3. Sample numbers for the regression model presented in Table 3 were somewhat smaller due to small amounts of missing data on the covariate factors.

Sample bias. The level of sample attrition raises issues of the extent to which the results may have been influenced by sample selection bias resulting from selective sample attrition. To examine this issue, all analyses were repeated using the techniques described by Carlin, Wolfe, Coffey, and Patton (1999). These methods involved a two-stage process. In the first stage, a sample selection model was constructed by using data gathered at birth to predict inclusion in the analysis sample. In all cases, this analysis showed that there were statistically significant ($p < .05$) tendencies for the analysis sample to under-represent children from more socially disadvantaged backgrounds (low parental education, single parent family, child of Māori or Pacific Island ethnicity). On the basis of the fitted selection model, the sample was then post-stratified into a series of groups and the probability of inclusion in the analysis sample was estimated for each group. In the second stage of the analysis, the data were reanalyzed with the observations for each individual weighted by the inverse of the probability of sample inclusion. In all cases, the weighted analyses produced essentially identical conclusions to the results reported here, suggesting that the effects of missing data and possible sample selection bias on the results were likely to be minimal.

Results

Associations between childhood physical punishment/maltreatment (0–16 years) and partnership outcomes up to age 30

Table 1 shows the sample subdivided into four groups ranging from those who reported no exposure to harsh or abusive physical punishment/maltreatment, to those reporting high exposure to parental physical punishment/maltreatment. The Table compares these four groups on six outcome measures. These measures are: (a) number of cohabiting partners over the period 16–30 years, (b) positive partner relations at age 30, (c) negative partner relations at age 30, (d) partner social adjustment at 30, (e) IPV victimization at age 30 and (f) IPV perpetration at age 30. As explained in Methods, the associations between childhood physical punishment/maltreatment and later outcomes were tested by fitting generalized linear models (Poisson regression, ordinary least squares regression and negative binomial regression) to the data in Table 1. The Table shows that for five of the six outcomes there were statistically significant ($p < .01$) associations between the extent of childhood physical punishment/maltreatment and measures of partner relations. The exception to this trend was for the measure of positive partner relationships ($p > .10$).

INSERT TABLE 1.

Associations between physical childhood punishment/maltreatment (0–16) and childhood social, family and related factors (0–16)

Table 2 shows the associations between the extent of retrospectively reported childhood physical punishment/maltreatment (0-16 years) and a series of prospectively measured childhood social, family and related factors. For ease of presentation, all factors were dichotomized and the table shows the percentages of each childhood physical punishment/maltreatment group who exhibited each particular characteristic. The association between the extent of childhood physical punishment/maltreatment and each factor was tested for statistical significance using the Mantel-Haenzel chi-square test for linearity (see Methods).

The Table shows consistent trends for increasing childhood physical punishment/maltreatment to be significantly ($p < .01$) associated with increasing family, social and

economic disadvantage, changes of parents, parental depression/anxiety, alcohol problems and criminality, interparental violence and childhood sexual abuse. These findings clearly raise the possibility that the apparent associations between childhood physical punishment/maltreatment and partnership outcomes shown in Table 1, were explained by the correlated or confounding effects of the risk factors shown in Table 2.

INSERT TABLE 2.

Associations between childhood physical punishment/maltreatment and partnership outcomes adjusted for confounding factors

To take account of the potentially confounding factors in Table 2, a series of regression models were fitted to the data with these models including all of the factors in Table 2 as covariates (see Methods). In these regressions, the covariate factors were scored as described in Methods and were not treated as dichotomous factors. Table 3 displays the results of this analysis. The table shows: (a) the unadjusted regression coefficients and standard errors between childhood physical punishment/maltreatment and each outcome, (b) the covariate adjusted regression coefficients and standard errors, (c) the tests of statistical significance and (d) the covariate factors that were significant ($p < .05$) in each regression equation. The table shows that after adjustment for potentially confounding factors, significant associations remained between exposure to childhood physical punishment/maltreatment and negative partner relations ($p = 0.002$), partner social adjustment problems ($p = 0.006$), IPV victimization ($p = 0.010$) and IPV perpetration ($p = 0.019$). However after adjustment, the relationship between childhood physical punishment/maltreatment and the number of cohabiting partners was no longer statistically significant ($p = 0.151$).

INSERT TABLE 3.

Tests of gender by childhood physical punishment/maltreatment interaction

As noted in the Introduction, there have been suggestions that the effects of childhood physical punishment/maltreatment on partnership outcomes vary by gender. To test this, the models fitted in Table 3 were extended to include a linear childhood physical punishment/maltreatment by gender interaction term (see Methods). This analysis showed that for four of the outcomes, there were no significant gender by childhood physical punishment/maltreatment interactions. However, for partner social adjustment problems there was clearly a statistically significant interaction term ($p=0.007$). Further exploration of the data showed that this interaction arose because the association between childhood physical punishment/maltreatment and partner social adjustment was large and statistically significant for females ($p<.001$), but small and non-significant for males ($p=0.177$). This interaction is illustrated in Figure 1, which shows the unadjusted associations between partner social adjustment and childhood physical punishment/maltreatment separately for males and females. These findings imply that childhood physical punishment/maltreatment was more influential in deviant partnership formation for females than it was for males.

INSERT FIGURE 1.

Discussion

In this study, we have examined the relationships between reported exposure to childhood physical punishment/maltreatment and later partnership outcomes, using data from a 30-year longitudinal study. The major findings of this analysis and their implications are reviewed below.

The first stage of the analysis examined the associations between exposure to childhood physical punishment/maltreatment and later partner relations up to the age of 30. This analysis showed clear tendencies for the extent of childhood physical punishment/maltreatment to be associated with increases in: the number of cohabiting partnerships; negative partner relations;

partner social adjustment problems; IPV victimization; and IPV perpetration. However childhood physical punishment/maltreatment was not associated with positive partner relationships. These findings clearly suggest that increasing exposure to childhood physical punishment/maltreatment was associated with more changeable, less satisfactory and more violent partnerships in later life.

Statistical control for a wide range of prospectively measured confounding factors reduced these associations somewhat, but did not eliminate most of them. After statistical control, significant associations remained between childhood physical punishment/maltreatment and later: negative partner relationships; partner social adjustment problems; IPV victimization; and IPV perpetration. These findings are consistent with the hypothesis that exposure to childhood physical punishment/maltreatment may act to impair the individual's ability to form relationships with this being reflected in less successful partner relations in later life. These results are consistent with previous research which has documented the association between childhood physical abuse and the nature and quality of partner relations (Colman & Spatz Widom, 2004; Desai, et al., 2002; Herrenkohl, et al., 2004; Larsen, et al., 2011; McKinney, et al., 2009; Mullen, et al., 1996; Swogger, et al., 2012; Whitfield, et al., 2003). The present study extends these findings by showing that these associations are also demonstrated in a well-studied birth cohort after the extensive control for confounding.

The findings of this study suggested that for a number of outcomes (number of cohabiting partnerships; negative partner relationships; IPV victimization; IPV perpetration), the associations of these outcomes with childhood physical punishment/maltreatment did not vary with gender. This implies that the adverse effect of childhood physical punishment/maltreatment on later partner relationship outcomes applies similarly to both males and females. Other previous research has also indicated that partnership outcomes are not influenced by gender (Desai, et al., 2002; Larsen, et al., 2011). However, an exception to this conclusion was for the association between childhood physical punishment/maltreatment and partner social adjustment problems, where there were clear gender differences. For females, exposure to childhood physical punishment/maltreatment was

associated with clear increases in the rates at which their partners displayed social adjustment problems such as alcohol misuse, substance abuse or criminality. On the other hand exposure to childhood physical punishment/maltreatment was unrelated to partner social adjustment for males. The reasons for this interactive relationship are not entirely clear, but it may reflect the fact that social adjustment problems were far more common in male partners than in female partners. This provides greater potential for an association between childhood physical punishment/maltreatment and partner adjustment problems for females exposed to childhood physical punishment/maltreatment.

More generally these findings add to the growing body of knowledge about the adverse influence of childhood physical abuse on longer-term wellbeing and suggest that these effects extend into shaping the nature and quality of partner relations in adulthood. These findings reinforce the need for greater social investment in the development of strategies and policies to prevent, treat and manage childhood physical abuse (Gilbert, et al., 2009; MacMillan et al., 2009).

An issue not resolved by this analysis is the extent to which childhood sexual abuse is also a risk factor for impaired partnership relationships in adulthood. This issue has been analyzed in a previous paper, which showed exposure to childhood sexual abuse was associated with a broad range of adverse partnership outcomes (Friesen, Woodward, Horwood, & Fergusson, 2010). These findings clearly suggest the possibility that physical and sexual abuse have cumulative effects on later partnership relationships.

Compared with previous research into the associations between childhood physical punishment/maltreatment and adult partnership outcomes, such as that of Colman and Spatz Widom (2004) and Herrenkohl (2004), this study has a number of advantages. These include the use of: a) data from a longitudinal 30-year birth cohort; b) high rates of sample retention; c) retrospective assessments of childhood physical punishment/maltreatment that were based on repeated measures obtained at ages 18 and 21, with the measures tested for reporting error and recall bias using structural equation modeling (Fergusson, et al., 2011); and d) extensive control for

confounding through the use of a large number of prospectively collected childhood social, family and related factors. This combination of factors makes it possible to assess the contribution of childhood physical punishment/maltreatment to adult partnership outcomes assessed over an extended period, net of various sources of confounding.

As with all research, this study has a number of limitations. These limitations center around the fact that the findings are based on a specific birth cohort, studied in a specific historical context, using self-reported interview data. The extent to which these findings apply to other cohorts assessed using other methods are not fully known.

In addition, the pathways by which childhood physical punishment/maltreatment leads to impaired partnerships are largely unknown but could include such factors as: interpersonal functioning impairments (Davis, et al., 2001); impaired ability to form secure attachments (Collins & Sroufe, 1999; Slominski, Sameroff, & Rosenblum, 2011), sub-optimal mate selection (Sassler, 2010), or exposure to unsatisfactory parental role models (Slominski, et al., 2011; Smith, Ireland, Park, Elwyn, & Thornberry, 2011). For these reasons, it is suggested that the assessment of childhood physical punishment/maltreatment should be part of a profile of personal factors routinely collected by therapists treating couples who have interpersonal difficulties.

Within the limitations of the research design, the findings of this study clearly suggest that exposure to childhood physical punishment/maltreatment was associated with impaired partnerships in later life, with these associations being evident up to the age of 30. The findings also suggest that while these outcomes were evident for both males and females, childhood physical punishment/maltreatment may have a greater influence on female partner selection.

The major significance of this study is that it adds to the understanding of the complex consequences of childhood physical punishment/maltreatment. The most important implications of these findings are that this research reinforces the need for greater intervention efforts directed at the reduction and management of this issue.

References

- Braiker, H., & Kelley, H. (1979). Conflict in the development of close relationships. In R. Burgess & T. Huston (Eds.), *Social exchange and developing relationships* (pp. 127-154). New York: Academic Press.
- Carlin, J. B., Wolfe, R., Coffey, C., & Patton, G. C. (1999). Tutorial in biostatistics. Analysis of binary outcomes in longitudinal studies using weighted estimating equations and discrete-time survival methods: Prevalence and incidence of smoking in an adolescent cohort. *Statistics in Medicine, 18*, 2655-2679.
- Carlson, B. E., Shafer, M. S., & Duffee, D. E. (2010). Traumatic histories and stressful life events of incarcerated parents II: Gender and ethnic differences in substance abuse and service needs. *The Prison Journal, 90*(4), 494-515.
- Collins, W. A., & Sroufe, L. A. (1999). Capacity for intimate relationships: A developmental construction. In W. Furman, B. B. Brown & C. Feiring (Eds.), *The development of romantic relationships in adolescence* (pp. 125-147). New York: Cambridge University Press.
- Colman, R. A., & Spatz Widom, C. (2004). Childhood abuse and neglect and adult intimate relationships: A prospective study. *Child Abuse and Neglect, 28*, 1133-1151.
- Davis, J. L., Petretie-Jackson, P. A., & Ting, L. (2001). Intimacy dysfunction and trauma symptomatology: Long-term correlates of different types of child abuse. *Journal of Traumatic Stress, 14*(1), 63-79.
- Desai, S., Arias, I., Thompson, M., & Basile, K. C. (2002). Childhood victimization and subsequent adult revictimization assessed in a nationally representative sample of women and men. *Violence and Victims, 17*(6), 639-653.
- Eckenrode, J., Laird, M., & Doris, J. (1993). School performance and disciplinary problems among abused and neglected children. *Developmental Psychology, 29*(1), 53-62.

- Elley, W. B., & Irving, J. C. (1976). Revised socio-economic index for New Zealand. *New Zealand Journal of Educational Studies*, 11(1), 25-36.
- Fergusson, D. M., & Horwood, L. J. (2001). The Christchurch Health and Development Study: Review of findings on child and adolescent mental health. *Australian and New Zealand Journal of Psychiatry*, 35(3), 287-296.
- Fergusson, D. M., Horwood, L. J., & Boden, J. M. (2011). Structural equation modeling of repeated retrospective reports of childhood maltreatment. *International Journal of Methods in Psychiatric Research*, 20(2), 93-104.
- Fergusson, D. M., Horwood, L. J., & Lynskey, M. T. (1996). Childhood sexual abuse and psychiatric disorder in young adulthood: II. Psychiatric outcomes of childhood sexual abuse. *Journal of the American Academy of Child and Adolescent Psychiatry*, 35(10), 1365-1374.
- Fergusson, D. M., Horwood, L. J., & Woodward, L. J. (2000). The stability of child abuse reports: A longitudinal study of young adults. *Psychological Medicine*, 30, 529-544.
- Fergusson, D. M., & Lynskey, M. T. (1997). Physical punishment/maltreatment during childhood and adjustment in young adulthood. *Child Abuse and Neglect*, 21(7), 617-630.
- Fergusson, D. M., Lynskey, M. T., & Horwood, L. J. (1996). Childhood sexual abuse and psychiatric disorder in young adulthood: I. Prevalence of sexual abuse and factors associated with sexual abuse. *Journal of the American Academy of Child and Adolescent Psychiatry*, 35(10), 1355-1364.
- Friesen, M. D., Woodward, L. J., Horwood, L. J., & Fergusson, D. M. (2010). Childhood exposure to sexual abuse and partnership outcomes at age 30. *Psychological Medicine*, 40(4), 679-688.
- Gilbert, R., Spatz Widom, C., Browne, K., Fergusson, D. M., Webb, E., & Janson, S. (2009). Burden and consequences of child maltreatment in high-income countries. *Lancet*, 373(9657), 68-81.
- Herrenkohl, T. I., Mason, W. A., Kosterman, R., Lengua, L. J., Hawkins, J. D., & Abbott, R. D. (2004). Pathways from physical childhood abuse to partner violence in young adulthood. *Violence and Victims*, 19(2), 123-136.

- Kaplan, S. J., Pelcovitz, D., & Labruna, V. (1999). Child and adolescent abuse and neglect research: A review of the past 10 years. Part I: Physical and emotional abuse and neglect. *Journal of the American Academy of Child & Adolescent Psychiatry*, 38(10), 1214-1222.
- Larsen, C. D., Sandberg, J. G., Harper, J. M., & Bean, R. (2011). The effects of childhood abuse on relationship quality: Gender differences and clinical implications. *Family Relations*, 60, 435-445.
- MacMillan, H. L., Wathen, C. N., Barlow, J., Fergusson, D. M., Leventhal, J. M., & Taussig, H. N. (2009). Interventions to prevent child maltreatment and associated impairment. *Lancet*, 373(9659), 250-266.
- McKinney, C. M., Caetano, R., Ramisetty-Mikler, S., & Nelson, S. (2009). Childhood family violence and perpetration and victimization of intimate partner violence: Findings from a national population-based study of couples. *Annals of Epidemiology* 19, 25-32.
- Mironova, P., Rhodes, A. E., Bethell, J. M., Tonmyr, L., Boyle, M. H., Wekerle, C., . . . Leslie, B. (2011). Childhood physical abuse and suicide related behavior: A systematic review. *Vulnerable Children and Youth Studies*, 6(1), 1-7.
- Mullen, P. E., Martin, J. L., Anderson, J. C., Romans, S. E., & Herbison, G. P. (1996). The long-term impact of the physical, emotional, and sexual abuse of children: A community study. *Child Abuse and Neglect*, 20, 7-21.
- Perez, C. M., & Spatz Widom, C. (1994). Childhood victimization and long-term intellectual and academic outcomes. *Child Abuse and Neglect*, 18(8), 617-633.
- Sassler, S. (2010). Partnering across the life course: Sex, relationships, and mate selection. *Journal of Marriage and Family*, 72, 557-575.
- Simpson, T. L., & Miller, W. R. (2002). Concomitance between childhood sexual and physical abuse and substance use problems: A review. *Clinical Psychology Review*, 22, 27-77.

- Slominski, L., Sameroff, A., & Rosenblum, K. (2011). Longitudinal pathways between maternal mental health in infancy and offspring romantic relationships in adulthood: A 30-year prospective study. *Social Development, 20*(4), 762-782.
- Smith, C. A., Ireland, T. O., Park, A., Elwyn, L., & Thornberry, T. P. (2011). Intergenerational continuities and discontinuities in intimate partner violence: A two-generational prospective study. *Journal of Interpersonal Violence, 26*(18), 3720-3752.
- Spatz Widom, C., & Morris, S. (1997). Accuracy of adult recollections of childhood victimization: Part 2. Childhood sexual abuse. *Psychological Assessment, 9*(1), 34-46.
- Spatz Widom, C., & Shepard, R. L. (1996). Accuracy of adult recollections of childhood victimization: Part 1. Childhood physical abuse. *Psychological Assessment, 8*(4), 412-421.
- Springer, K. W., Sheridan, J., Kuo, D., & Carnes, M. (2007). Long-term physical and mental health consequences of childhood physical abuse: Results from a large population-based sample of men and women. *Child Abuse and Neglect, 31*, 517-530.
- Stevenson, J. (1999). The treatment of the long-term sequelae of child abuse. *Journal of Child Psychology & Psychiatry, 40*(1), 89-111.
- Straus, M. A. (1979). Measuring intrafamily conflict and violence: The conflict tactics (CT) scale. *Journal of Marriage and Family, 41*, 75-88.
- Straus, M. A., Hamby, S. L., Boney-McCoy, S., & Sugarman, D. B. (1996). The revised Conflict Tactics Scales (CTS2). Development and preliminary psychometric data. *Journal of Family Issues, 17*(3), 283-316.
- Sugaya, L., Hasin, D. S., Olfson, M., Lin, K.-H., Grant, B. F., & Blanco, C. (2012). Child physical abuse and adult mental health: A national study. *Journal of Traumatic Stress, 25*, 384-392.
- Swogger, M. T., Walsh, Z., Kosson, D. S., Cashman-Brown, S., & Caine, E. D. (2012). Self-reported childhood physical abuse and perpetration of intimate partner violence: The moderating role of psychopathic traits. *Justice and Behavior*(39), 7.

Whitfield, C. L., Anda, R. F., Dube, S. R., & Felitti, V. J. (2003). Violent childhood experiences and the risk of intimate partner violence in adults: Assessment in a large health maintenance organization. *Journal Interpersonal Violence, 18*(2), 166-185.

Caption for Figure 1.

Interaction of childhood physical punishment/maltreatment by gender in the prediction model of partner social adjustment problems.

Legend for Figure 1.

- Observed mean (Males)
- x Observed mean (Females)
- Fitted regression line (Males)
- Fitted regression line (Females)

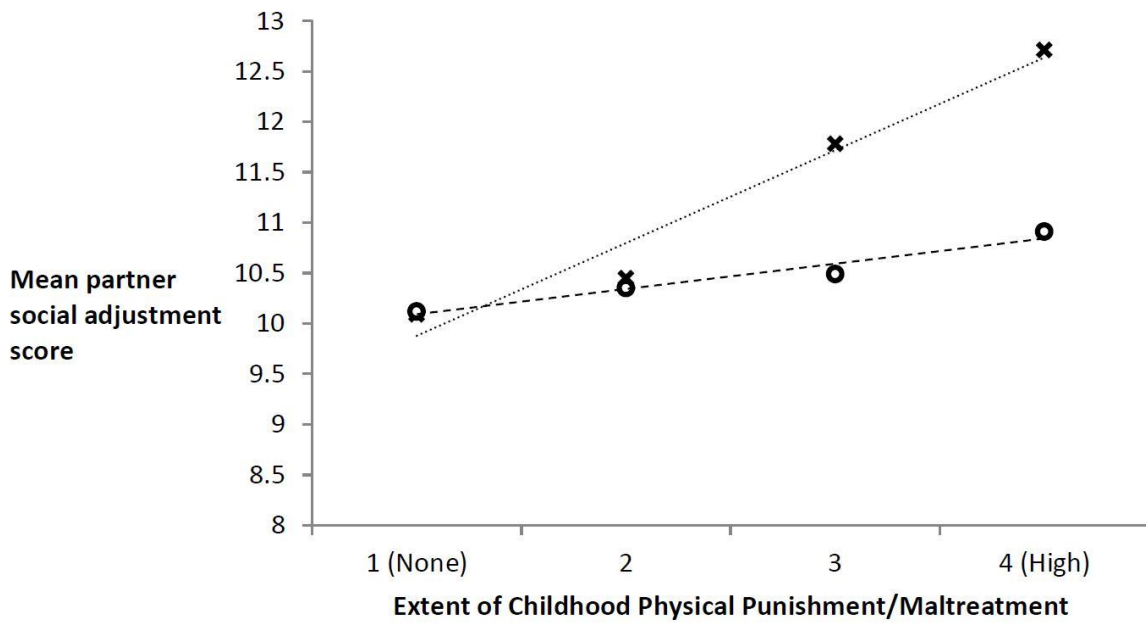


Table 1

Associations between childhood physical punishment/maltreatment 0–16 years and partnership outcomes up to age 30.

	Extent of Childhood Physical Punishment/Maltreatment				<i>p</i>
	1 (None)	2	3	4 (High)	
<u>Relationship history</u>	<i>n</i> =42	<i>n</i> =766	<i>n</i> =110	<i>n</i> =66	
Mean (SD) cohabiting partnerships (16–30)	1.55 (1.04)	1.41 (1.00)	1.74 (1.29)	1.74 (1.16)	<.001 ¹
<u>Partner relations</u> ⁴	<i>n</i> =38	<i>n</i> =673	<i>n</i> =102	<i>n</i> =60	
Mean (SD) positive partner relations score	40.00 (6.15)	40.12 (5.58)	39.99 (4.85)	38.73 (6.46)	0.134 ²
Mean (SD) negative partner relations score	11.95 (2.45)	12.52 (3.28)	13.28 (4.02)	14.60 (5.20)	<.001 ²
Mean (SD) partner social adjustment problems score	10.11 (1.33)	10.41 (2.10)	10.96 (2.71)	12.05 (3.92)	<.001 ²
<u>Intimate partner violence</u> ⁴	<i>n</i> =38	<i>n</i> =674	<i>n</i> =103	<i>n</i> =60	
Mean (SD) victimization score	0.05 (0.23)	0.25 (1.04)	0.51 (1.53)	0.80 (2.44)	0.003 ³
Mean (SD) perpetration score	0.05 (0.23)	0.16 (0.69)	0.50 (1.69)	0.55 (1.27)	<.001 ³

Note. ¹ Poisson regression; ² Least squares regression; ³ Negative Binomial regression; ⁴ These results are based on reports of all cohort members in partnerships at age 29–30 years.

Table 2

Associations between the extent of reported childhood physical punishment/maltreatment (0–16 years) and childhood social, family and related factors.

Measure	Extent of Childhood Physical Punishment/Maltreatment				<i>p</i>
	1 (None)	2	3	4 (High)	
<u>Sociodemographic background</u>					
% Mother aged <25 years at birth of child	38.3	44.7	55.9	76.1	<.001
% Child of single parent family	6.3	5.1	7.6	20.9	<.001
% Family of low SES (unskilled/semi-skilled occupational status at birth)	23.4	22.3	33.9	43.3	<.001
% Mother lacked formal educational qualifications at birth	48.9	47.9	51.7	67.2	<.001
% Father lacked formal educational qualifications at birth	51.1	47.1	59.3	61.2	0.008
% In lowest quartile averaged family living standards (0–10 years)	13.2	33.6	33.9	54.6	<.001
% In lowest quartile averaged family income (0–10 years)	15.7	43.8	28.4	48.8	<.001
<u>Family functioning</u>					
% Any change of parents (0–16 years)	34.0	32.2	52.5	74.6	<.001
% Parental history of depression/ anxiety (15 years)	26.2	28.1	35.7	47.5	0.001
% Parental history of alcohol problem (15 years)	14.3	9.4	19.1	32.2	<.001
% Parental history of criminality (15 years)	11.9	11.0	15.7	39.0	<.001
% Child witnessed interparental violence (<16 years)	31.9	40.0	50.9	76.1	<.001
<u>Childhood history of abuse</u>					
% Any sexual abuse (<16 years)	17.0	11.6	12.7	44.8	<.001

Table 3

Associations between extent of childhood physical punishment/maltreatment (0–16 years) and partnership outcomes at age 30: (a) unadjusted and (b) adjusted for covariates.

Outcome	(a) Unadjusted		(b) Adjusted for covariates		
	<i>B (SE)</i>	<i>p</i>	<i>B (SE)</i>	<i>p</i>	Significant covariates ¹
<u>Cohabiting partnerships (n=925)</u>					
Number of cohabiting partnerships (16-30 years)	0.148 (0.040)	<.001	0.067 (0.047)	0.151	2
<u>Partner relations (n=823)²</u>					
Negative partner relations score	0.910 (0.190)	<.001	0.669 (0.216)	0.002	3
Partner social adjustment problems score	0.689 (0.126)	<.001	0.384 (0.140)	0.006	1, 4
<u>Intimate partner violence (n=825)²</u>					
Victimization score	0.691 (0.236)	0.003	0.743 (0.289)	0.010	–
Perpetration score	0.801 (0.231)	<.001	0.661 (0.281)	0.019	5

¹ 1= Sole parent at child's birth, 2= Parental history of offending, 3= Parental report of alcohol problems, 4= Number of changes of parents, 5= Childhood sexual abuse.

² These regressions are based on all study participants in partnerships at age 29-30 who had complete data on all covariates.