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Pre-school children with and without developmental delay: behaviour problems and parenting stress over time

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Abstract

Background Children with intellectual disability are at heightened risk for behaviour problems and diagnosed mental disorder.
Methods The present authors studied the early manifestation and continuity of problem behaviours in 205 pre-school children with and without developmental delays.
Results Behaviour problems were quite stable over the year from age 36–48 months. Children with developmental delays were rated higher on behaviour problems than their non-delayed peers, and were three times as likely to score in the clinical range. Mothers and fathers showed high agreement in their rating of child problems, especially in the delayed group. Parenting stress was also higher in the delayed group, but was related to the extent of behaviour problems rather than to the child's developmental delay.
Conclusions Over time, a transactional model fit the relationship between parenting stress and behaviour problems: high parenting stress contributed to a worsening in child behaviour problems over time, and high child behaviour problems contributed to a worsening in parenting stress. Findings for mothers and fathers were quite similar.

Keywords behaviour problems, children, dual diagnosis, parenting stress

Introduction

When intellectual disability (ID) is accompanied by emotional or behavioural problems, this 'dual diagnosis' presents heightened challenges to the individual, the family and the service delivery system. People with mild or moderate ID are at greatly increased risk for mental disorder; the range of disorders and their symptom pictures are similar to those in persons without ID (Nezu *et al.* 1992; Pfeiffer & Baker 1994). People with more severe ID present a great many problem behaviours, most notably self-stimulation, self-injury and aggression (Singh 1997; Tonge 1999). However, they are not as readily diagnosed with mental disorder by standard psychiatric criteria; for example, their limited communication abilities require the diagnostician to make more inferences from their behaviour.

The behaviour problems in children with ID are of particular interest, as they may yield insights into the

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origins of dual diagnosis. They are also of clinical concern since they impose early limitations on the child's development. Recent studies of children with ID have found high behaviour problem rates. Einfeld & Tonge (1996) surveyed 454 families in New South Wales, Australia, who had a child aged between 4 and 18 years with ID. The above authors reported that 41% had emotional and behavioural problems on their Developmental Behavioural Checklist (DBC) which met the criteria for 'definite psychiatric disorder'. In a study of children aged between 6 and 18 years in Cape Town, South Africa, Molteno *et al.* (2001) used a teacher version of the DBC and found that 31% met criteria for a condition. Comparable rates of 37% and 35% were reported by Stromm & Diseth (2000) and Linna *et al.* (1999), respectively. The latter authors, studying 6000, 8-year-olds in Finland, found that rates of children with ID 'possibly suffering from a psychiatric disturbance' were 3.0 times as high as for non-disabled children. However, little is known about how early in life elevated problem behaviours are evident.

The overall aim of the present authors' research programme is to derive a better understanding of this heightened risk for mental disorder in children with ID. Because they are studying young children, the authors use the term 'behaviour problems', although they expect that these will lead to diagnosable mental disorder in later childhood in many cases. Similarly, the authors use the term 'developmental delay' because, for some of the children, it is not as yet clear whether they will meet criteria for ID. They have examined problem behaviours in 225, 3-year-olds with or without developmental delays (Baker *et al.* 2002). Children with delays were already evidencing significantly higher problem behaviours at this young age. For example, mothers scored behaviour problems on the Child Behavior Checklist (CBCL) in the clinical range for 26.1% of the children in the delayed group and only 8.3% of the non-delayed group, a ratio of 3.1:1. Moreover, although parents in families in the delayed group perceived greater child-related stress, behaviour problems actually had a much more significant influence on parental stress levels than the children's cognitive functioning. The present study extends these findings by examining the continuity of child behaviour problems, and their relationship with parenting stress, for 205 of these children over the ensuing year.

Continuity

The continuity of problem behaviours across childhood is a central issue in developmental psychopathology. Longitudinal studies of children without developmental delays have revealed moderate to high continuity, especially over short periods (1–3 years) and for externalizing problems (Egeland *et al.* 1990; Campbell *et al.* 1991; Campbell 1994; Heller *et al.* 1996). Most such studies have focused on high-risk groups, and thus, the continuity may be representative mainly for children with more severe problems (Caron & Rutter 1991). However, Lavigne *et al.* (1998) reported high stability in pre-school children recruited from pediatric practices, as did Heller *et al.* (1996) for those recruited from pre-schools. For children with developmental delays, heightened behaviour problems appear at least by the pre-school years (Richman *et al.* 1982; Kopp *et al.* 1992; Merrell & Holland 1997). However, there are few longitudinal studies of continuity of behaviour problems in children with developmental delays. One exception is the specific problem of self-injurious behaviour, which is reported to have high persistence rates across childhood (Emerson *et al.* 1996; Murphy *et al.* 1999) and into adulthood (Emerson *et al.* 2001). The present study enrolled children with mild or moderate ID, where self-injurious behaviour was rare. Continuity was assessed from the age of 3–4 years, based upon mother and father reports of a wide range of child problems on the new 1.5–5 years version of the CBCL (Achenbach 2000).

Parenting stress

A child with developmental delays poses multiple parenting challenges (Baker *et al.* 1997). While families generally develop positive ways of coping with these, and demonstrate considerable resilience (Turnbull *et al.* 1993), in countless studies parents have reported heightened stress, especially in domains related to child rearing (Crnic *et al.* 1983; Orr *et al.* 1993; Baker *et al.* 1997; Fidler *et al.* 2000; Hauser-Cram *et al.* 2001).

Two issues concerning parenting stress are of particular interest. First, although stress has traditionally been viewed as a result of developmental delays *per se*, or of the increased demands resulting from the child's support needs, the influence of behaviour

problems may have been underestimated. In families where a child has an ID, parenting stress levels appears to be highest in the childhood years, diminishing as the individual ages (Baker & Blacher 2002). A related finding is that stress levels fluctuate according to the developmental stages and demands which parents face, with the highest stress at the onset of adolescence and transition to young adulthood (Wikler 1986; Blacher 2001). Child problem behaviours have been found to relate significantly to child-related parent stress in recent studies of specific genetic disorders, such as Smith–Magenis syndrome (Hodapp *et al.* 1998) or Down's syndrome (DS; Stores *et al.* 1998), and also in studies of samples with mixed diagnoses (Stores *et al.* 1998; Hauser-Cram *et al.* 2001). In their study of 3-year-old children, the present authors found that, when the influence of behaviour problems on parenting stress was accounted for, mental development explained no additional variance (Baker *et al.* 2002). In the present study, they examine whether this relationship holds over time.

Secondly, there is the perennial question of direction of effect. Whereas specific problem behaviours are part of the phenotype in some genetic disorders (e.g. eating problems in Prader–Willi syndrome and self-injury in Lesch–Nyan syndrome; Dykens *et al.* 2000), and thus, are not likely to be caused by family factors for most children and most problem behaviours, it is likely that such factors do matter. Parental stress is one domain of family risk and protective factors that may be relevant to the emergence, or exacerbation, of behaviour problems (Crnic & Greenberg 1987; Margalit *et al.* 1989) since a highly stressed parent may engage in parenting behaviours which are less growth-promoting. In the present longitudinal study, the authors examine three possible interactions of child behaviour problems and parents' perception of negative impact or stress: (1) child behaviour problems predict subsequent increased parenting stress; (2) parenting stress predicts subsequent increased behaviour problems; or (3) both causal explanations apply.

Mothers and fathers

The present study examines child behaviour problems from the perspective of fathers as well as mothers. Assessments of child behaviour problems typically rely on informants' opinions, usually through checklists, and most studies of young children have enlisted mothers as informants. Critics have argued that this practice gives an incomplete picture since fathers form different relationships with their children and have different opportunities to observe them (Phares 1996; Hay *et al.* 1999). Thus, mother and father ratings probably include shared view and individual view components (Rowe & Kandel 1997). The shared view represents a trait that generalizes across settings and observers, while the individual view represents a unique perception that may contain elements of accuracy, reflecting the fact that each parent has access to different symptoms, and also individual bias (Richters 1992). Studies which have attempted to estimate shared and individual views reflected in parental behaviour ratings, using ratings of twins (Simonoff *et al.* 1995) or siblings (Rowe & Kandell 1997), have demonstrated that mothers' and fathers' ratings contain not just a substantial trait component, but a substantial individual view component as well. Although there has been little study of mother–father agreement in behaviour problem ratings for children with delays, the present authors found significantly higher agreement in delayed group families than in non-delayed group families (Baker *et al.* 2002). In the present study, they examine whether this high mother–father agreement holds over time, and consider the relationship between behaviour problems and stress separately for fathers and mothers.

Therefore, the present study addressed three primary questions concerned with behaviour problems in a sample of 205 children, with and without delays, during the pre-school period from 3 to 4 years of age. First, do children with developmental delays evidence more behaviour problems than children without delays and is this difference stable over time? Secondly, what is the relationship between child behaviour problems and parenting stress? If these two domains are related, do child behaviour problems lead to increased parenting stress, and/or does high stress in parents leads to increases in child behaviour problems? Thirdly, how similar are mothers and fathers in their assessment of child behaviour problems, and in the relationship between child problems and parenting stress?

Subjects and methods

Participants

The participants were 205 families with a 3-year-old child. They had been recruited to participate in a 2-year longitudinal study of young children from the ages of 3 to 5 years, with samples drawn from Central Pennsylvania and Southern California, USA. The children were classified as delayed ($n = 82$) or non-delayed ($n = 123$). Families in the delayed group were recruited primarily through community agencies which serve people with developmental disabilities. The selection criteria were that the child: (1) be between 30 and 40 months of age; (2) receive a score on the Bayley Scales of Infant Development II (BSID-II, see below) between 30 and 75; (3) be ambulatory; and (4) not be diagnosed with autism. Non-delayed group families were recruited primarily through pre-schools and day-care programmes. The selection criteria were that the child: (1) be between 30 and 40 months of age; (2) receive a score on the BSID-II of 85 or above; and (3) not be born prematurely or have a developmental disability.

Table 1 shows the demographic characteristics of this sample by group status (i.e. delayed or non-delayed). The children's age at intake averaged 35.2 months (SD = 3.03, range = 29–42 months); 97.1% of children were between the ages of 30 and 40 months at intake, and 45.4% were within one month of their third birthday. In the combined sample, there were more boys (58%) than girls and 61% of the children were Caucasian. In the delayed group, the most frequent diagnoses were DS (14.6%) and cerebral palsy (9.8%); the majority of children had not received a specific diagnosis. Recruitment initially focused on intact families, and therefore, most (86%) participants were married (defined here as legally married or living together for at least 6 months). The socio-economic status was generally high, with 51% of mothers and 50% of fathers having graduated from college, and 52% of families having an annual income of US$50 000 or more.

The two groups did not differ on the child attributes shown in Table 1 except, of course, BSID-II scores. However, the parent and family attributes which indicated socio-economic status were significantly higher in the non-delayed families, with a greater percentage of mothers and fathers graduating from college and more families with incomes at $50 000 or more. Socio-economic status indicators were co-varied in subsequent analyses where these correlated significantly with the dependent variable.

Table 1 Demographic by group status (i.e. delayed and non-delayed) ($n = 205$): (BSID-II: MDI) Bayley Scales of Infant Development II: Mental Development Index

Variable	Group status		
	Delayed ($n = 82$)	**Non-delayed ($n = 123$)**	**t- or χ^2 value**
Children			
Mean age (SD) at testing (months)	35.6 (2.86)	34.9 (3.13)	$t = 1.51$
Gender (percentage boys)	65.9	52.8	$\chi^2 = 3.42$
Race (percentage Caucasian)	59.8	62.6	$\chi^2 = 0.17$
Siblings (percentage only children)	32.9	29.3	$\chi^2 = 0.31$
Mean BSID-II: MDI score (SD)	57.9 (11.62)	104.0 (11.60)	$t = 27.89^{***}$
Parents and family			
Marital status (percentage married)	81.7	88.6	$\chi^2 = 1.94$
Mother's education (percentage with a college degree)	30.5	64.2	$\chi^2 = 22.41^{***}$
Mother's employment (percentage employed)	50.0	60.2	$\chi^2 = 2.06$
Father's education (percentage with a college degree) ($n = 185$)	37.1	58.3	$\chi^2 = 7.76^{**}$
Family income (percentage earning $50K+)	43.9	58.2	$\chi^2 = 4.02^{*}$

$^{*}P < 0.05$; $^{**}P < 0.01$; $^{***}P < 0.001$.

Assessments

The data examined in the present study were obtained in two ways. The initial measures of the child's developmental level and problem behaviours were obtained at the home intake assessment session, conducted when the child was between 30 and 39 months of age. Prior to this session, the parents had completed a telephone intake interview with the authors' staff, and had received project descriptions and the informed consent form. Two trained researcher assistants visited the family for a 2-h assessment session. After reviewing procedures, answering questions, and obtaining informed consent, the staff administered the BSID-II to the child. During this test, the mother and, if present, the father completed a demographic questionnaire and the CBCL (see below). Measures which were not completed during the assessment session were mailed to the authors soon after. The CBCL was obtained again at a home assessment session when the child was 48 months of age. The measure of the child's impact on the family was part of a measure packet completed prior to a home observation, conducted at 36 months or soon after the intake, if the intake was later than 36 months, and conducted again at 48 months.

Measures

Bayley Scales of Infant Development II

The BSID-II (Bayley 1993) is a widely used assessment of mental and motor development in children aged between one and 42 months. The BSID-II was administered in the child's home, with the mother present. In most cases, there was a primary examiner and an assistant. Only mental development items were administered. The Mental Development Index (MDI) is normed with a mean of 100 and a standard deviation of 15. Bayley (1993) reported high short-term test–retest reliability for the MDI ($r = 0.91$).

Child Behavior Checklist for Ages $1^1/_2$–5

The CBCL (Achenbach 2000) is a new version of the widely used CBCL (Achenbach 1991), aimed at the pre-school years. It has 99 items which indicate child problems, listed in alphabetical order (from 'aches and pains without medical cause' to 'worries'), and one 'other' item. The respondent indicates for each item whether it is (0) 'not true', (1) 'somewhat or sometimes true', or (2) 'very true or often true', now or within the past 2 months. The CBCL yields a total problem score, broadband externalizing and internalizing scores, and narrowband scales (emotionally reactive, depressed/anxious, withdrawn, somatic, sleep problems, attention and aggression). Scale sum scores were used in analyses. Total score alphas for the present sample were 0.94 for both mothers and fathers.

Family Impact Questionnaire

The Family Impact Questionnaire[1] (FIQ; Donenberg & Baker 1993) is a 50-item questionnaire that asks about the 'child's impact on the family compared to the impact other children his/her age have on their families' (e.g. item 1: 'My child is more stressful'). Parents endorse items on a four-point scale ranging from 'not at all' to 'very much'. Five scales measure negative impact on feelings about parenting (nine items), social relationships (11 items), finances (seven items), and if applicable, siblings (nine items) and marriage (seven items). One scale measures impact on positive feelings about parenting (seven items). A combined score (negative impact) is the sum of the

[1]The FIQ (Donenberg & Baker 1993) was developed in an effort to avoid a confounding factor that is present in many measures of parenting stress. These 'stress' measures ask not only about the parents' experiences, but also about the child's cognitive and behavioural difficulties. This is evident in the Questionnaire on Resources and Stress (QRS-F; Friedrich *et al.* 1983), which, in various forms, is the most frequently used measure of stress in families of children with ID, as well as the Parenting Stress Index (PSI: Abidin 1990), which refers to all children. Each measure contains items which describe challenges presented by the child; endorsement of these adds to the total score. Thus, there is the assumption in the items and scoring that there is a relationship between child challenges and parenting stress, the very assumption that many studies seek to test. When the parents of children with disabilities score higher than those of normally developing children on these measures, the conclusion that these parents are more stressed is to some degree circular. The FIQ directly asks about parents' experiences in child rearing, without items which refer to the child's behaviour. The term 'impact' was used because the measure assesses both positive impact of the child on the family and negative impact (roughly equated with stress). Although conceived differently, the negative impact/stress scores are, nonetheless, rather highly related to the stress scores on the QRS-F ($r = 0.68$ and 0.70 for mothers and fathers, respectively, at 36 months in the present sample of children with delays) and the PSI ($r = 0.84$ in a sample of young children without delays; Donenberg & Baker 1993).

first two negative impact scales. Alphas in the present sample for negative impact were 0.92 for mothers and 0.89 for fathers; for positive impact, both alphas were 0.81.

Results

Following an examination of the distribution of the primary child behaviour problem and family impact variables, parametric statistics were used for data analysis.

Child behaviour problems

For both groups combined, parent reports of child problems at 36 and 48 months were highly stable. The correlations across time points for mothers and fathers, respectively, were: 0.76 and 0.75 for total problems scores; 0.67 and 0.67 for internalizing scores; and 0.75 and 0.73 for externalizing scores. All were significant at $P < 0.001$.

Child behaviour scores by delay status and time

The two delay status groups were contrasted on the CBCL scales over time. Analyses were conducted as 2 (status: delayed or non-delayed) × 2 (time: 36 or 48 months) analyses of covariance. Education and family income, on which the delay status groups differed, were related to some of the dependent variables for mothers and fathers, and thus, were co-varied for all analyses. Table 2 shows the mothers' CBCL scores. Compared with non-delayed children, those in the delayed group had significantly higher total scores, internalizing and externalizing broadband scores, and attention, aggression, somatic and social withdrawal narrowband scores. Scores were quite stable over the one-year period, with only two significant time effects: total scores and anxious/depressed scores decreased somewhat. The status groups did not change differentially over time; no status by time interaction was significant, although this interaction approached significance for the total score ($P = 0.055$).

Table 3 shows the fathers' CBCL scores. Fathers reported the same status group differences as mothers did, except for somatic problems. The fathers' scores were also quite stable across time periods, with no significant time effects and only one significant status by time interaction; attention problems scores increased for children in the delayed group and decreased for non-delayed group children.

Table 2 Mothers' Child Behavior Checklist (CBCL) scores by group status (i.e. delayed or non-delayed) and time of assessment. N.B. Analyses were run as 2 × 2 analyses of variance (group status × time), co-varying for mother's education and family income

	Group status				*F*-value		
	Delayed ($n = 82$)		Non-Delayed ($n = 122$)				
CBCL score	**36 months**	**48 months**	**36 months**	**48 months**	**Group status**	**Time**	**Group status × time**
Externalizing	17.04	16.67	13.19	11.56	10.42**	2.65	2.63
Internalizing	11.80	12.32	8.11	8.17	11.63**	2.54	1.39
Attention	4.11	4.22	2.27	2.10	42.00***	0.37	1.44
Aggression	12.90	12.40	10.90	9.50	4.04*	2.92	2.29
Emotional reactivity	3.00	3.21	2.35	2.46	2.34	2.53	0.95
Anxious/depressed	2.98	2.91	2.39	2.20	2.06	4.13*	1.30
Somatic	2.56	2.73	1.71	1.70	8.01**	1.74	1.28
Withdrawal	3.27	3.48	1.66	1.82	29.65***	0.08	0.07
Sleep	3.39	3.15	3.73	3.02	0.18	2.06	1.76
Total	46.16	46.30	34.24	31.26	15.78***	4.56*	3.73

*$P < 0.05$; **$P < 0.01$; ***$P < 0.001$.

Table 3 Fathers' Child Behavior Checklist (CBCL) scores by group status (i.e. delayed or non-delayed) and time of assessment. N.B. Analyses were run as 2 × 2 analyses of variance (group status × gender), co-varying for father's education and family income

	Group status				*F*-value		
	Delayed ($n = 65$)		Non-Delayed ($n = 106$)				
CBCL score	36 months	48 months	36 monthsG	48 months	Group status	Time	Group status × time
Externalizing	16.06	15.48	12.58	11.33	8.23**	0.88	0.42
Internalizing	10.66	10.46	7.80	8.33	6.12*	1.15	1.40
Attention	3.86	4.15	2.63	2.14	26.06***	0.22	6.54*
Aggression	12.20	11.32	9.94	9.19	3.92*	0.91	0.03
Emotional reactivity	2.63	2.78	1.92	2.27	3.14	1.42	0.54
Anxious/depressed	2.89	2.57	2.46	2.29	0.32	0.01	0.77
Somatic	2.14	2.17	1.78	2.01	0.90	2.86	0.91
Withdrawal	3.05	2.94	1.64	1.75	18.82***	0.06	0.52
Sleep	3.25	3.18	3.56	3.01	0.24	0.07	1.10
Total	43.26	42.18	32.84	30.75	10.44**	0.01	0.04

*$P < 0.05$; **$P < 0.01$; ***$P < 0.001$.

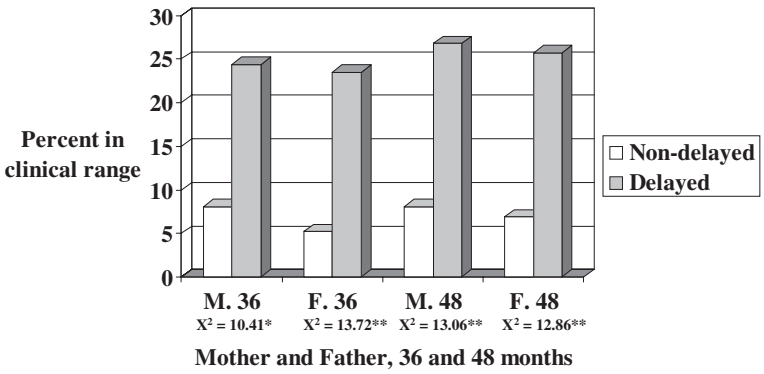

Figure 1 Percentage of children in the delayed (■) and non-delayed (□) groups with total Child Behavior Checklist scores in the clinical range at 36 and 48 months. Continuity-corrected chi-square: (*) $P < 0.01$; and (**) $P < 0.001$.

Children meeting the criteria for clinical range

The present authors determined the number of children in each status group who were at or above the clinical cut-off (*T*-score = 64) on the total CBCL score (Achenbach 2000). Figure 1 shows these results with chi-square statistics. For mothers, at 36 months, the CBCL total *T*-score was in the clinical range for 8.1% of non-delayed children and 24.4% of delayed children, a ratio of 1:3.1. At 48 months, the percentages were very similar, i.e. 8.1% and 26.8%. Mothers' classifications were reasonably stable across the time points (continuity corrected $\chi^2 = 74.2$, $P < 0.001$), with 70% of children classified in the clinical range at 36 months similarly classified at 48 months, and 94% of children below the clinical range at 36 months still below the clinical range at 48 months.

For fathers, at 36 months, the CBCL total *T*-score was in the clinical range for 5.2% of non-delayed children and 23.5% of children who were delayed, a ratio of 1:4.3. At 48 months, the percentages were very similar, i.e. 6.9% and 25.7%. The fathers' classifications also were reasonably stable across the time points (continuity corrected $\chi^2 = 65.7$, $P < 0.001$); 73% of children classified in the clinical range at 36 months were similarly classified at 48 months, and

94% of children below the clinical range at 36 months were still below the clinical range at 48 months.

Mothers versus fathers

Mother and father agreement

In the combined sample, there was strong agreement between the mothers' and fathers' CBCL scale scores. Pearson correlations at 36 and 48 months for total problem scores (0.68 and 0.65, respectively), internalizing (0.69 and 0.58, respectively), and externalizing (0.67 and 0.69, respectively) scores were all significant at $P < 0.001$. Agreement on the narrowband scales at 36 months ranged from 0.50 (anxious/depressed) to 0.68 (attention problems), and at 48 months this ranged from 0.38 (anxious/depressed) to 0.67 (aggression). All correlations were significant at $P < 0.001$. Moreover, the mothers' and fathers' mean scores were highly similar; mean differences were not significant for any broadband or narrowband scale at either assessment point.

Table 4 shows the parents' agreement by delay status. At each assessment, the parents of the group who were delayed had higher agreement on every scale than the parents in the non-delayed group. At 36 months, the parents of the delayed group had significantly higher agreement on the total CBCL score and the emotional reactivity scale. By 48 months, the parents of the delayed group had significantly higher agreement on the total score, internalizing and externalizing broadband scores, and several narrowband scales, including emotional reactivity, anxious/depressed and aggression.

Mother–father agreement as to classification (clinical range or below) at 36 months was equally high for parents in the delayed ($\kappa = 0.51$, $P < 0.001$) and the non-delayed group ($\kappa = 0.60$, $P < 0.001$). However, one year later, classification agreement had increased for parents in the delayed group ($\kappa = 0.74$, $P < 0.001$), but markedly decreased for the non-delayed group ($\kappa = 0.04$, not significant).

Family impact

Correlations of family impact scores across the two assessments for the combined sample are shown in Table 5; these indicate considerable stability. Table 5 also shows the means for each status group (i.e. delayed and non-delayed) at each assessment (36 and 48 months). Two (status) × two (time) analyses of variance were conducted; parental education and family income did not relate to FIQ scores, and therefore, these variables were not co-varied. There was a highly significant status group effect for mothers and fathers on negative views of parenting, social relations and finances, with the parents of the group who were delayed reporting more negative impact on these

Table 4 Correlations of mothers' and fathers' Child Behavior Checklist (CBCL) scores by group status (i.e. delayed or non-delayed) at 36 and 48 months. N.B. All correlations are significant at $P < 0.001$ except for 48 months, non-delayed, 'Anxious/depressed', where $P = 0.01$

	Group status			
	36 months		48 months	
CBCL score	**Delayed ($n = 68$)**	**Non-delayed ($n = 116$)**	**Delayed ($n = 69$)**	**Non-delayed ($n = 110$)**
Externalizing	0.72	0.62	0.79	0.54**
Internalizing	0.76	0.60	0.68	0.45*
Attention	0.73	0.56	0.66	0.49
Aggression	0.69	0.57	0.80	0.52***
Emotional reactivity	0.69	0.42*	0.58	0.33*
Anxious/depressed	0.50	0.49	0.56	0.24*
Somatic	0.74	0.60	0.68	0.57
Withdrawal	0.64	0.59	0.66	0.46
Sleep	0.74	0.62	0.70	0.52
Total	0.76	0.57*	0.74	0.47**

*$P < 0.05$; **$P < 0.01$; ***$P < 0.001$. These asterisks indicate the significance of the difference between mother/father agreement correlations in the delayed versus non-delayed groups.

Table 5 Family Impact Questionnaire scores by delay status and time of assessment

		Group status				*F*-value		
		Delayed (*n* = 82)		Non-delayed (*n* = 122)				
FIQ score	*r*†	36 months	48 months	36 months	48 months	Status	Time	Group status × time
Mothers								
Negative impact‡	0.84	18.3	18.1	11.5	12.0	21.41***	0.21	0.89
Views of parenting	0.76	9.3	9.2	7.0	7.3	10.79**	0.14	0.45
Social relations	0.82	9.0	8.9	4.4	4.8	25.65***	0.16	0.75
Finances	0.78	4.9	5.3	2.4	2.8	16.27***	2.75	0.03
Marriage	0.68	4.8	4.7	4.4	4.6	0.23	0.12	0.38
Siblings	0.66	5.7	5.8	4.6	4.5	5.03*	0.00	0.21
Positive impact	0.69	15.3	15.3	16.2	15.9	1.49	0.46	0.17
Fathers								
Negative impact‡	0.77	15.2	16.3	11.0	10.1	18.00***	0.04	5.87*
Views of parenting	0.71	7.8	8.2	6.6	6.2	7.79**	0.02	3.15
Social relations	0.76	7.4	8.1	4.4	3.8	22.58***	0.01	5.24*
Finances	0.57	5.2	4.9	2.1	2.7	23.22***	0.21	2.14
Marriage	0.72	4.7	5.0	4.4	4.5	0.50	1.01	0.24
Siblings	0.50	5.1	5.7	4.8	4.8	1.79	1.01	1.46
Positive impact	0.64	16.2	15.2	16.8	16.9	3.08	3.45	2.28

*$P < 0.05$; **$P < 0.01$; ***$P < 0.001$.

†Pearson's *r*, representing stability from 36 to 48 months for the combined sample (all $P < 0.001$).

‡The negative impact score is a sum of negative impact on views of parenting and social relations.

scales and on the combined negative impact scale. There were no significant time effects. For fathers, there was a significant time × status interaction on the negative impact composite; over time, the fathers of the group who were delayed reported more negative impact and non-delayed group fathers reported less negative impact. On the positive impact scale, there were no status, time or status × time effects.

Parenting stress, child delay and behaviour problems

The relationship between child characteristics and parenting stress over time were examined using two sets of hierarchical multiple regressions. In the first analyses, the dependent measure was the FIQ 48-month negative impact (stress) score. On step 1, the present authors entered the 36-month negative impact score. On step 2, they entered both the total CBCL score at 36 months and the CBCL total change from 36 to 48 months. On step 3, they entered the child's BSID-II Mental Development Index score. For mothers, this model explained 78% of the variance in negative impact at 48 months. Step 1, the 36-month negative impact score, accounted for 71.1% of the variance. Step 2, initial level and change in behaviour problems, accounted for an additional 6.5% of the variance [*F*-value change (d.f. = 2) = 28.92, $P < 0.001$]. Step 3, the child's cognitive level, did not account for significant variance.

For fathers, this model explained 69% of the variance in negative impact at 48 months. Step 1, the 36-month negative impact score, accounted for 61.5% of the variance. Step 2, initial level and change in behaviour problems, accounted for an additional 5.9% of the variance [*F*-value change (d.f. = 2) = 15.43, $P < 0.001$]. Step 3, the child's cognitive level, accounted for an additional 1.5% [*F*-value change = 8.16, $P < 0.01$]. Thus, for mothers and fathers, although negative impact scores were highly stable over this one-year period, the child's initial behaviour problems and change in behaviour problems each accounted for significant additional variance. Of note is that the child behaviour problems score at 36 months accounts for considerable variance in the

negative impact score at that time, and therefore, entering 36-month negative impact first in the present analyses minimized the apparent contribution of problem behaviours to subsequent negative impact.

An alternative explanation for the relationship between child behaviour problems and stress is that parental stress contributes to the development and worsening of child behaviour. The second set of hierarchical regressions tested this hypothesis. The dependent variable was 48-month total child problems. On step 1, the present authors entered 36-month total child problems. On step 2, they entered the initial level and change in parenting stress (negative impact). For mothers, this model explained 70% of the variance in total problem score at 48 months. Step 1, the total score at 36 months, accounted for 57.7% of the variance, and step 2, initial level and change in stress, accounted for an additional 12.2% [F-value (d.f. = 2) = 40.08, $P < 0.001$]. Similarly, for fathers, the model explained 66% of the variance. Step 1, total score at 36 months, accounted for 56.4%, and step 2, initial level and change in negative impact, accounted for an additional 9.4% [F-value (d.f. = 2) = 23.23, $P < 0.001$]. The BSID-II MDI, added as step 3, did not significantly contribute for either parent. To summarize the regression analyses, there is evidence that child behaviour problems predict subsequent mother and father stress levels, after accounting for prior stress. Moreover, parental stress predicts subsequent child behaviour problem levels, after accounting for prior behaviour problems.

Discussion

The present authors first asked whether there was continuity across one year in behaviour problems for pre-school children, and whether problems of children with developmental delay continued to be greater than for typically developing children. The answer to both questions was affirmative. Behaviour problems were quite stable over the year from 3 to 4 years of age for children with and those without developmental delay. Stability was indicated both by moderate to high correlations and the absence of significant mean changes across the two assessments. Children with developmental delays were scored higher on behaviour problems than their non-delayed peers by mothers and fathers alike. Based on total CBCL scores, about three times as many children with delays scored in the clinical range at each assessment, as did children without delays. For mothers, there was a nearly significant interaction of status group by time on the total CBCL score, whereby problems increased slightly for the group who were delayed, but decreased for the non-delayed group.

The group differences were broad, including the total CBCL score, the broadband externalizing and internalizing scores, and a number of narrowband scores; the group who were delayed and the non-delayed group differed most in attention problems and social withdrawal. However, the groups did not differ significantly on emotional reactivity, anxious/depressed and sleep problems. In addition to these parental reports, in the present authors' previous study, examiners who administered the BSID-II when the children were aged 3 years had scored children in the delayed group as significantly lower on the emotional regulation section of the behaviour scales (Baker *et al.* 2002). However, the present authors' findings differ from those of Hauser-Cram *et al.* (2001), who assessed 183 children with developmental delays at 3 years of age; the latter authors did not find mother-reported externalizing or internalizing CBCL scores to be elevated relative to the non-disabled standardization sample (Achenbach & Edelbrock 1983).

Mothers and fathers

The present authors examined child behaviour problems and family impact from the perspective of both mothers and fathers. Overall, there was moderate agreement between mothers and fathers in their assessment of these domains, and the interrelationships among these variables over time for fathers were very similar to those found for mothers. One finding of particular interest was the higher parental agreement about behaviour problems for children with delays. There have been few reports of mother–father agreement, even with non-delayed children. Using a predominantly middle socio-economic-status (SES) sample, Baker & Heller (1996) found a moderate relationship for pre-school children's CBCL externalizing scores ($r = 0.55$), but an insignificant relationship for internalizing scores ($r = 0.12$). Studying a sample of lower SES families whose children attended urban Head Start programmes, Fagan & Fantuzzo (1999) found moderate agreements

for externalizing ($r = 0.54$) and internalizing problems ($r = 0.42$). These findings are consistent with prior findings of higher agreement for disruptive than for internalizing behaviours (Edelbrock *et al.* 1986; Achenbach *et al.* 1987; Christensen *et al.* 1992). In the present study, the especially high agreement between the mothers and fathers of children with delays may reflect a greater salience of a wide range of behaviour problems, with these behaviours generalizing more across settings and observers (the trait or shared view component considered earlier). Furthermore, the high parental agreement may partly derive from the more frequent discussions about the child's difficulties which the mothers and fathers of children with disabilities have with each other and with professionals.

A further possibility is that the fathers of children in the present authors' delayed group shared child care more with mothers than did those in the non-delayed group. Several studies indicate that mother–father agreement in rating child behaviour is greater when fathers are more involved with their children. Using three measures of aggression, Fitzgerald *et al.* (1994) found that correlations were higher in families with more involved fathers ($r = 0.57$ versus 0.40). Similarly, Fagan & Fantuzzo (1999) measured the extent to which fathers shared in child care, and found that congruence in ratings of child self-control and externalizing problems were positively associated with the degree of shared child care experience. The extent of shared child care seems a promising variable to explore further. Whatever its source, the very high parental agreement between parents of children with delays is interesting in view of recent criticisms from authors, including the present ones, that most family research in child psychopathology and ID has focused too exclusively on mothers (Phares 1996; Baker *et al.* 1997). The finding that there is more significant mother–father agreement in these families than in families not challenged with disability, and that the relationship of child maladaptive behaviour and parenting stress is quite similar, adds some validity to past findings based exclusively on mothers.

Family impact and child behaviour problems

The present authors explored family functioning over time, focusing on parents' reports of positive and negative impact of the target child on the family. From the 36–48-month assessment, positive impact scores were moderately stable and negative impact scores were highly stable for mothers and fathers alike. The parents of children with and without delays did not differ in their appraisal of positive impact. Negative impact, or stress, scores were considerably higher for the parents of children in the delayed group, a finding that is consistent with a vast literature on families and disability (Kazak 1987; Cameron *et al.* 1991; Baker *et al.* 1997). Following families of children with delays from infancy through 10 years of age, Hauser-Cram *et al.* (2001) found increasing parental stress such that, by child age 10, four times as many parents were reporting stress in the clinical range as parents in the non-disabled standardization sample.

The present authors had found earlier that, at the 36-month assessment, these differences in negative impact were related much more strongly to the child's maladaptive behaviour than to cognitive delay (Baker *et al.* 2002). In the present analyses, despite high stability over time in both child behaviour problems and negative impact, child problem behaviours at 36 months and changes in child problem behaviours over the one-year period were found to be associated with increases in parent stress. However, it was also the case that parenting stress at 36 months and changes in parenting stress over the one-year period were also associated with increases in child behaviour problems. Thus, these findings are consistent with the notion that maladaptive child behaviour and parenting stress have a mutually escalating effect on each other, which is consistent with often proposed, but less studied, transactional models (Sameroff & Chandler 1975; Greenbaum & Auerbach 1998; Sameroff *et al.* 1998). To understand this association better, future research could focus on how highly stressed parents behave in parenting interactions with their children. The assumption here is that the parenting environment interacts with the characteristics of the child (in this case, child problem behaviours) and also that the child's behaviours have a critical impact on the parenting environment. Over time, this effect may be greater for some individuals than for others, depending upon protective factors present (e.g. parental mental health, social support or SES). While protective factors were not the focus of the present study, it will be important to examine how these

affect the transactional relationship between behaviour problems in young children and the parenting environment. In any event, the finding that parenting stress is related much more strongly to child behaviour problems than to cognitive functioning should be encouraging to service providers because there is considerable evidence that behaviour problems can be reduced successfully through psychological and pharmacological interventions.

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References

Abidin R. R. (1990) *Parenting Stress Index Manual*, 3rd edn. Pediatric Psychology Press, Charlottesville, VA.

Achenbach T. M. (1991) *Manual for the Child Behavior Checklist*. University of Vermont, Department of Psychiatry, Burlington, VT.

Achenbach T. M. (2000) *Manual for the Child Behavior Checklist* $1^1/_2$–5. University of Vermont, Department of Psychiatry, Burlington, VT.

Achenbach T. M. & Edelbrock C. S. (1983) *Manual for the Child Behavior Checklist and Revised Child Behavior Profile*. University Associates in Psychiatry, Burlington, VT.

Achenbach T. M., McConaughy S. H. & Howell C. T. (1987) Child/adolescent behavioral and emotional problems: implications of cross-informant correlations for situational specificity. *Psychological Bulletin* **101,** 312–232.

Achenbach T. M. & Rescorla L. A. (2000) *Manual for ASEBA Preschool Forms and Profiles*. University of Vermont, Department of Psychiatry, Burlington, VT.

Baker B. L. & Blacher J. (2002) For better or worse? Impact of residential placement on families. *Mental Retardation* **44,** 1–13.

Baker B. L., Blacher J., Crnic K. & Edelbrock C. (2002) Behavior problems and parenting stress in families of three-year-old children with and without developmental delays. *American Journal on Mental Retardation* **107,** 433–444.

Baker B. L., Blacher J., Kopp C. B. & Kraemer B. (1997) Parenting children with mental retardation. *International Review of Research in Mental Retardation* **20,** 1–45.

Baker B. L. & Heller T. L. (1996) Preschool children with externalizing behaviors: experience of fathers and mothers. *Journal of Abnormal Child Psychology* **26,** 513–32.

Bayley N. (1993) *Bayley Scales of Infant Development: Manual*, 2nd edn. The Psychological Corporation, San Antonio, TX.

Blacher J. (2001) Transition to adulthood: mental retardation, families, and culture. *American Journal on Mental Retardation* **106,** 173–88.

Cameron S. J., Dobson L. A. & Day D. M. (1991) Stress in parents of developmentally delayed and non-delayed preschool children. *Canada's Mental Health* **39,** 13–7.

Campbell S. B. (1994) Hard to manage preschool boys: externalizing behavior, social competence, and family context at two-year follow up. *Journal of Abnormal Child Psychology* **22,** 147–66.

Campbell S. B., March C. L., Pierce E., Ewing L. J. & Zumowski E. K. (1991) Hard-to-manage preschool boys: symptomatic behavior across contexts and time. *Child Development* **65,** 836–51.

Caron C. & Rutter M. (1991) Comorbidity in child psychopathology: issues and research strategies. *Journal of Child Psychology and Psychiatry* **32,** 1063–80.

Christensen A., Margolin G. & Sullaway M. (1992) Interparental agreement on child behavior problems. *Psychological Assessment* **4,** 419–25.

Crnic K. A., Friedrich W. N. & Greenberg M. T. (1983) Adaptation of families with mentally retarded children: a model of stress, coping, and family ecology. *American Journal of Mental Deficiency* **88,** 125–38.

Crnic K. A. & Greenberg M. T. (1987) Transactional relationships between perceived family style, risk status, and mother–child interactions in two year olds. *Journal of Pediatric Psychology* **12,** 343–62.

Donenberg G. & Baker B. L. (1993) The impact of young children with externalizing behaviors on their families. *Journal of Abnormal Child Psychology* **21,** 179–98.

Dykens E. M., Hodapp R. M. & Finucane B. M. (2000) *Genetics and Mental Retardation Syndromes: A New Look at Behavior and Interventions*. Paul H. Brookes Publishing, Baltimore, MD.

Edelbrock C., Costello A., Dulcan M. K., Conover N. C. & Kala R. (1986) Parent-child agreement on child psychiatric symptoms. *Journal of Child Psychology and Psychiatry* **27,** 181–90.

Egeland B., Kalkoske M., Gottesman N. & Farrell-Erickson M. (1990) Preschool behavior problems: stability and factors accounting for change. *Journal of Child Psychology and Psychiatry* **31,** 891–909.

Einfeld S. L. & Tonge B. J. (1996) Population prevalence of psychopathology in children and adolescents with intellectual disability. II. Epidemiological findings. *Journal of Intellectual Disability Research* **40,** 99–109.

Emerson E., Kiernan C., Alborz A., Reeves D., Mason H., Swarbrick R., Mason L. & Hatton C. (2001) Predicting the persistence of severe self-injurious behavior. *Research in Developmental Disabilities* **22,** 67–75.

Emerson E., Robertson J., Letchford S., Fowler S. & Jones M. (1996) The long-term effects of behavioural residential special education on children with severely challenging behaviours: changes in behaviour and skills. *Journal of Applied Research in Intellectual Disabilities* **9,** 240–55.

Fagan J. & Fantuzzo J. W. (1999) Multirater congruence on the Social Skills Rating System: mother, father, and teacher assessments of urban Head Start children's social competencies. *Early Childhood Research Quarterly* **14,** 229–42.

Fidler D. J., Hodapp R. M. & Dykens E. M. (2000) Stress in families of young children with Down syndrome, Williams syndrome, and Smith–Magenis syndrome. *Early Education and Development* **11,** 395–406.

Fitzgerald H. E., Zucker R. A., Maguin E. T. & Reider E. E. (1994) Time spent with child and parental agreement about preschool children's behavior. *Perceptual and Motor Skills* **79,** 336–8.

Friedrich W. N., Greenberg M. T. & Crnic K. A. (1983) A short-form of the Questionnaire on Resources and Stress. *American Journal of Mental Deficiency* **88,** 41–8.

Greenbaum C. W. & Auerbach J. G. (1998) The environment of the child with mental retardation: risk, vulnerability, and resilience. In: *Handbook of Mental Retardation and Development* (eds J. A. Burach, R. M. Hodapp & E. Zigler), pp. 583–605. Cambridge University Press, Cambridge.

Hauser-Cram P., Warfield M. E., Shonkoff J. P. & Kraus M. W. (2001) Children with disabilities: a longitudinal study of child development and parent well-being. *Society for Research in Child Development Monographs* **66,** 1–131.

Hay D. F., Pawlby S., Sharp D., Schmuker G., Mills A., Allen H. & Kumar R. (1999) Parents' judgments about young children's problems: why mothers and fathers might disagree yet still predict later outcomes. *Journal of Child Psychology and Psychiatry* **40,** 1249–58.

Heller T. L., Baker B. L., Henker B. & Hinshaw S. (1996) Externalizing behavior and cognitive functioning from preschool to first-grade. *Stability and Predictors Journal of Clinical Child Psychology* **25,** 376–87.

Hodapp R. M., Fidler D. J. & Smith A. C. M. (1998) Stress and coping in families of children with Smith–Magenis syndrome. *Journal of Intellectual Disability Research* **42,** 331–40.

Kazak A. E. (1987) Families with disabled children: stress and social networks in three samples. *Journal of Abnormal Child Psychology* **15,** 137–46.

Kopp C. B., Baker B. L. & Brown K. W. (1992) Social skills and their correlates: preschoolers with developmental delays. *American Journal of Mental Retardation* **96,** 357–66.

Lavigne J. V., Arend R., Rosenbaum D., Binns H. J., Christoffel K. K. & Gibbons R. D. (1998) Psychiatric disorders with onset in the preschool years, I. Stability of diagnoses. *Journal of the American Academy of Child and Adolescent Psychiatry* **37,** 1246–54.

Linna S. L., Moilanen I., Ebeling H., Piha J., Kumpulainen K., Tamminen T. & Almqvist F. (1999) Psychiatric symptoms in children with intellectual disability. *European Child and Adolescent Psychiatry* **8** (Suppl. 4, IV)**,** 77–82.

Margalit M., Shulman S. & Stuchiner N. (1989) Behavior disorders and mental retardation: the family system perspective. *Research in Developmental Disabilities* **10,** 315–26.

Merrell K. W. & Holland M. L. (1997) Social-emotional behavior of preschool-age children with and without developmental delays. *Research in Developmental Disabilities* **18,** 393–405.

Molteno G., Molteno C. D., Finchilescu G. & Dawes A. R. L. (2001) Behavioural and emotional problems in children with intellectual disability attending special schools in Cape Town, South Africa. *Journal of Intellectual Disability Research* **45,** 515–20.

Murphy G., Hall S., Oliver C. & Kissi-Debra R. (1999) Identification of early self-injurious behaviour in young children with intellectual disability. *Journal of Intellectual Disability Research* **43,** 149–63.

Nezu C. M., Nezu A. M. & Gill-Weiss M. J. (1992) *Psychopathology in Persons with Mental Retardation*. Research Press, Champaign, IL.

Orr R. R., Cameron S. J., Dobson L. A. & Day D. M. (1993) Age-related changes in stress experienced by families with a child who has developmental delays. *Mental Retardation* **31,** 171–6.

Pfeiffer S. I. & Baker B. L. (1994) Residential treatment for children with dual diagnosis of mental retardation and mental disorder. In: *When There's No Place Like Home: Options for Children Living Apart from Their Natural Families* (ed. J. Blacher), pp. 273–98. Paul H. Brookes Publishing, Baltimore, MD.

Phares V. (1996) *Fathers and Developmental Psychopathology*. Wiley, New York, NY.

Richman N., Stevenson J. & Graham P. J. (1982) *Preschool to School: A Behavioural Study*. Academic Press, London.

Richters J. E. (1992) Depressed mothers as informants about their children: a critical review of the evidence for distortion. *Psychological Bulletin* **112,** 485–99.

Rowe D. C. & Kandel D. (1997) In the eye of the beholder? Parental ratings of externalizing and internalizing symptoms. *Journal of Abnormal Child Psychology* **25,** 265–75.

Sameroff A. J., Bartko W. T., Baldwin A., Baldwin C. I. & Seifer R. (1998) Family and social influences on the development of child competence. In: *Families, Risk, and*

Competence (eds M. Lewis & C. Feiring), pp. 161–85. Lawrence Erlbaum Associates, Mahwah, NJ.

Sameroff A. & Chandler M. (1975) Reproductive risk and the continuum of caretaking casuality. In: *Review of Child Development Research*, **Vol. 4** (ed. F. Horowitz), pp. 187–243. University of Chicago Press, Chicago, IL.

Simonoff E., Pickles A., Hewitt J., Silberg J., Rutter M., Loeber R., Meyer J., Neale M. & Eaves L. (1995) Multiple raters of disruptive child behavior: using a genetic strategy to examine shared views and bias. *Behavior Genetics* **25,** 311–26.

Singh N. N. (ed.) (1997) *Prevention and Treatment of Severe Behavior Problems: Models and Methods in Developmental Disabilities*. Brookes/Cole, Pacific Grove, CA.

Stores R., Stores G., Fellows B. & Buckley S. (1998) Daytime behaviour problems and maternal stress in children with Down's syndrome, their siblings, and non-intellectually disabled and other intellectually disabled peers. *Journal of Intellectual Disability Research* **42,** 228–37.

Stromme P. & Diseth T. H. (2000) Prevalence of psychiatric diagnoses in children with mental retardation: data from a population-based study. *Developmental Medicine and Child Neurology* **42,** 266–70.

Tonge B. J. (1999) Psychopathology of children with developmental disabilities. In: *Psychiatric and Behavioural Disorders in Developmental Disabilities and Mental Retardation* (ed. N. Bouras), pp. 157–74. Cambridge University Press, Cambridge.

Turnbull A. P., Patterson J. M., Behr S. K., Murphy D. L., Marquis J. G. & Blue-Banning M. J. (eds) (1993) *Cognitive Coping, Families, and Disability*. Paul H. Brookes Publishing, Baltimore, MD.

Wikler L. (1986) Periodic stresses in families of mentally retarded children: an exploratory study. *American Journal of Mental Deficiency* **90,** 703–6.

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