

Stress in Parents of Children with Developmental Disabilities over Time

Abstract

Stress levels of parents whose children have developmental disabilities (DD) are significantly higher than those of parents with typically developing children. However, few studies have looked at the effects of child characteristics on parent stress over time. The aim of the present study is to assess whether changes in child behaviour problems or adaptive functioning affect parent stress. Using data from the National Early Intervention Research Initiative, predictors and correlates of stress were examined in parents of children with developmental disabilities who attend early intervention (EI) programs (n = 21). Families participated in two rounds of data collection, approximately two and a half years apart. At Time 1 child behaviour problems significantly predicted parent stress ($\beta = .71$, $t(53) = 7.47$, $p < .0001$). Between Time 1 and Time 2 child behaviour problems decreased significantly ($t(19) = 2.13$, $p < .05$), as did parent stress ($t(19) = 3.58$, $p = .002$). At Time 2, child behaviour problems were significantly related with parent stress ($r(19) = .74$, $p < .0001$), and so was child adaptive functioning ($r(19) = -.53$, $p < .05$), although adaptive function did not change significantly between Time 1 and Time 2. The results are discussed in the context of current EI practice and policy in Canada.

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Raising a child is always stressful, but raising a child with developmental disabilities (DD) can present special challenges for parents. In fact, stress levels of parents whose children have DD are significantly higher than those of parents with typically developing children (e.g., Dyson, 1997; Hassall, Rose, & McDonald, 2005; Minnes, 1998; Solomon, Ono, Timmer, & Goodlin-Jones, 2008). In a meta-analysis of 18 studies conducted between 1984 and 2003, Singer (2006) found that the number of mothers of children with DD who scored in the clinically significant range for depression increased by 10% over the preceding 25 years, whereas a similar increase was not found in mothers of typically developing children. The investigation of parent stress and well-being is an important component in the study of child well-being. Studies investigating families who are at risk for poor developmental outcomes have shown that when parents are under high levels of stress they show less effective parenting skills (Ostberg, 1998; Secco et al., 2006).

Parents of children with DD often experience atypical interactions with their children that are due in part to characteristics of their children which are different from those of typically developing children. For instance, children with DD often display a greater number of behaviour problems than typically developing children (e.g., Baker, McIntyre, Blacher,

Crnic, Edelbrock, & Low, 2003; Feldman, Hancock, Rielly, Minnes, & Cairns, 2000; Lach et al., 2009; Linna et al., 1999; Lopes, Clifford, Minnes, & Ouellette-Kuntz, 2008). Problem behaviours can include aggression, destructiveness, defiance, hyperactivity, sleep disturbances, and anxiety, to name a few (Feldman et al., 2000; Jewell, Jordan, Hupp, & Everett, 2009; Keller & Fox, 2009). These problem behaviours can have negative effects on parents due to the stress the behaviours cause and due to the added time management that the behaviours often require (Plant & Sanders, 2007). The presence of behaviour problems in children with DD has been linked to elevated stress in their parents (e.g., Bromley, Hare, Davison, & Emerson, 2004; Hassall et al., 2005; Hauser-Cram et al., 2001; Pisula, 2007). Furthermore, adaptive functioning, that is, "the performance of the daily activities required for personal and social sufficiency" (Sparrow, Balla, & Cicchetti, 2005, p. 6), is often limited in children with DD. Children who struggle with day to day activities such as eating and drinking, toileting, dressing, bathing, grooming, and health care, require support from a parent or caregiver to accomplish these tasks. For children with DD this struggle is common and is often present across areas of daily living and across the lifespan (Bailey, Raspa, Holiday, Bishop, & Olmsted, 2009; Haveman, van Berkum, Reijnders, & Heller, 1997; Patel, Greydanus, Calles, & Pratt, 2010; Stewart, 2009). The added strain of performing more daily living tasks for their children with DD than parents of typically developing children can lead to elevated stress in parents of children with DD (Beckman, 1991; Plant & Sanders, 2007).

Lazarus and Folkman (1984) define psychological stress as "a particular relationship between the person and the environment that is appraised by the person as taxing or exceeding his or her resources and endangering his or her well-being" (p. 19). As such, parents' stress is often affected by their interactions with their children, which are affected by their children's behaviour. Friedrich, Wiltner, and Cohen (1985) found the relationship between child medical involvement, child behaviour problems, maternal coping resources, and parent and family problems to be bidirectional. Similarly, in a review of the literature, Mash and Johnson (1990) reported that in families

with a hyperactive child, parental stress was affected by both parent and child characteristics. Thus, when a child has a DD his or her maladaptive behaviour may influence parent affect, in turn affecting parent behaviour, and subsequently negatively impacting parent-child interactions. Such a cycle may lead to a reduced quality of life for these families and to an increased burden on our health and education systems in the form of long term care needs for the children with DD who grow up to be adults with DD (e.g., Farran, 2000; Grant, 2005; U.S. Department of Education, 2002). One way of framing this relationship is through Sameroff and Chandler's (1975) transactional model of development, which proposes that both the environment and the child are malleable, constantly interacting with and being affected by each other. In fact, parental adaptation to a child's disability has been found to be a complex and lifelong process (Hauser-Cram et al., 2001; Poehlmann, Clements, Abbeduto, & Farsad, 2005), one that can change over time as a result of, for example, changes in the parent-child system. These changes can be due to behavioural and adaptive changes in the children.

The purpose of the present study was twofold. First, we wanted to explore the relationship between parent stress and child behaviour and adaptive functioning in a sample of families of children with DD. Second, we wanted to examine parent stress and child functioning over time. Given the literature which shows a relationship between parent stress and child behaviour problems, we expected that child behaviour would be related to parent stress and that maladaptive behaviour in children would predict stress in parents. In addition, following the literature suggesting that child adaptive functioning is related to parent stress, we expected that child adaptive functioning would also be related to parent stress and that lower adaptive functioning in children would predict stress in parents. Research on stress in parents of children with DD has shown that the stress levels of these parents often remain high over time (Hauser-Cram et al., 2001). However, given the relationship between parent stress and child functioning, we hypothesized that if child behaviour and adaptive functioning improved over time, then parent stress would also improve over time.

Materials and Methods

Participants

The participants were parents (primarily mothers) of children with DD, recruited through three Early Intervention (EI) centres in two large metropolitan cities in Canada. EI programs focus on education and therapy for families and their young children (school age or younger) who have or who are at risk for developmental problems. The goal of such interventions is maintaining or maximizing the child's development in order to minimize delays (e.g., Guralnick, 2001, 2005; Majnemer, 1998), while at the same time assisting parents in their own adaptation to their child (Brinker, Seifer, & Sameroff, 1994) and providing them with support through access to resources and information (e.g., Bailey & Powell, 2005; Guralnick, 2001, 2005; Majnemer & Limperopoulos, 2009; Majnemer & Mazer, 2004; Mazer & Majnemer, 2009). Participants were part of a larger longitudinal National Early Intervention Research Initiative (NEIRI), the primary goal of which is to develop and implement an assessment process to inform public policy on early childhood intervention practice. The ultimate outcome is to develop and implement an action-oriented national blueprint to change current policy and practice in Canadian EI. Eighty-four families returned the consent form agreeing to participate. Full data sets could not be obtained from 39 participants for various reasons (e.g., some children were too young for some of the measures, some parents completed only some of the measures). This left 56 participating families of children with DD (31 boys and 25 girls) for whom complete data sets were obtained at the first time of testing.

Children ranged in age from 9 months to 10.1 years ($M = 5.96$, $SD = 2.73$). All children entered the study before they turned 10 years of age, and all children were receiving EI services prior to age 9. The EI programs included were private, not for profit, public, or government organizations. Programs were excluded from the study if they were not multidisciplinary or did not provide child services. In addition, families whose children received fewer than two intervention services were not included in the study. Families reported receiving different types and amounts of services. Services were therapy-based (e.g.,

applied behavioural analysis, speech-language, occupational, physical, play, horseback riding, creative arts), parent-based (e.g., social work, respite, counselling), health-based (e.g., nutrition services, medical/acute care, home-based nursing), and education-based (e.g., assistive technology). All children had a diagnosis of a DD, or were at risk for developing a DD (see Table 1 for a complete breakdown of diagnoses). Fifty-three of the respondents were mothers, two were fathers, and one was a paternal aunt. Families were primarily two-parent (91%) and the majority reported having at least a community college education (77%). See Table 1 for complete demographic information.

Participants were contacted again an average of 2.4 years ($M = 2.37$, $SD = 0.44$) after Time 1. Complete data sets were obtained from 21 parents, 19 of whom were mothers and two of whom were fathers (the same two fathers who responded at Time 1). Of those families for whom complete data sets were not available, five had completed the VABS-II interview, but not the parent-report measures; four completed the VABS-II interview and some of the parent-report measures, but one or both of the two parent-report measures used in the present study were not complete; two completed parent forms but not the VABS-II interview; and six families who did not participate in parent data collection continued to have their children participate in the child assessment component of the larger project, as did six of the parents listed above who completed some of the parent measures. Thus, while 21 parents were included in the Time 2 data analyses, another 17 of the original Time 1 sample were still participating in the study in some capacity at Time 2. For complete Time 2 demographics, see Table 2.

Measures

Parenting Stress Index (PSI, Long Version; Abidin, 1995)

The PSI was used to evaluate stress in the parents of children with DD. The PSI is a standardized self-report questionnaire designed to identify potentially dysfunctional parent-child systems (Abidin, 1995). The PSI consists of 101 Likert-scale items for which respondents have the option of choosing strongly agree, agree,

Table 1. Child and Parent Demographics at Time 1

*Demographic categories*Child age in years and months (*M (range)*)

Site 1	4:6 (0:9-9:4)
Site 2	4:9 (2:2-9:11)
Site 3	8:6 (6:2-10:1)

Diagnostic group (*no.*)

Autism/PDD-NOS	18/3
Global developmental delay	11
Down syndrome	7
Cerebral palsy	3
Rett's syndrome	2
ADHD	1
Angelman syndrome	1
Asperger syndrome	1
At-risk for DD	1
Borderline intellectual disability	1
Communication disorder	1
Hypoxic ischemic encephalopathy	1
Low tone	1
Primary carnitine deficiency	1
Tourette's disorder & ADHD	1
Williams syndrome	1

Gender (*no.*)

Males	31
Females	25

Responding parents or guardian (*no.*)

Mothers	53
Fathers	2
Paternal aunt	1

Parents' age (*M, SD*)

38.02 (5.97)*

Responding parents' level of education (*no. and %*)

High school	6	(10.7%)
Some college/university	2	(3.5%)
College/trade school graduate	15	(26.8%)
University degree	17	(30.4%)
Graduate/professional	11	(19.6%)
Undisclosed	5	(9%)

Parents' marital status (*no. and %*)

Married	51	(91%)
Divorced/Single	3	(5%)
Separated	1	(2%)
Undisclosed	1	(2%)

* Based on 55 of 56 since one did not disclose age

Table 2. Child and Parent Demographics at Time 2

<i>Demographic categories</i>		
Child age in years and months (<i>M (range)</i>)		
Site 1	5:6	(4:3–8:11)
Site 2	7:6	(3:10–11:5)
Site 3	11:4	(9:5–12:7)
Diagnostic group (<i>no.</i>)		
Autism/PDD-NOS	6/1	
Global developmental delay	5	
Down syndrome	1	
Cerebral palsy	1	
Rett's syndrome	1	
ADHD	1	
Angelman syndrome	1	
Borderline intellectual disability	1	
Hypoxic Ischemic Encephalopathy	1	
Nemaline myopathy	1	
Williams syndrome	1	
Gender (<i>no.</i>)		
Males	9	
Females	12	
Parents (<i>no.</i>)		
Mothers	19	
Fathers	2	
Parents' age (<i>M, SD</i>)	40.1	(5.26)
Parents' level of education (<i>no. and %</i>)		
High school	4	(19%)
College/trade school graduate	3	(14.2%)
University degree	7	(33.3%)
Graduate/professional	6	(28.6%)
Undisclosed	1	(4.8%)
Parents' marital status (<i>no. and %</i>)		
Married	19	(90.5%)
Divorced/Single	1	(4.7%)
Separated	1	(4.7%)

not sure, disagree, or strongly disagree. Both child- and parent-related stress are assessed by the PSI, through the Child Domain and the Parent Domain, respectively. The Child Domain subscale examines actual and perceived stressors related to child characteristics. The Parent Domain subscale examines specific traits of the parent and family context. Together, the Child Domain and Parent Domain create a Total Stress

Domain (Abidin, 1995). For the present study, the Total Stress Domain was used as the dependent variable. Total Stress raw scores of 260 or higher fall in the critical range (80th percentile) and are indicative of stress levels that may require psychological intervention (Abidin, 1995).

The PSI has strong internal consistency with coefficient alpha reliability coefficients of .95 for

both a normative and a validation sample for the Total Stress Domain. Four different studies assessed the test-retest reliability of the PSI over periods of one month to one year. The correlation coefficients for the Total Stress Domain ranged from .65 to .96. The author notes that these relatively high reliability coefficients provide support for the stability of PSI scores over time (Abidin, 1995).

Vineland Adaptive Behavior Scales-II, Survey Interview Form (VABS-II; Sparrow, Cicchetti, & Balla, 2005)

The VABS-II was used to assess child adaptive behaviour. The VABS-II is a semi-structured survey interview conducted with parents that assesses adaptive functioning in children (Sparrow et al., 2005). The VABS-II is composed of four domains: Communication, Daily Living Skills, Socialization, and Motor Skills. These four domains make up the Adaptive Behavior Composite Score (Sparrow et al., 2005). The present study examined the Adaptive Behavior Composite to assess adaptive behaviour.

Internal consistency of the Adaptive Behavior Composite is very high, with reliability coefficients ranging from .94 to .98 for children birth to 18 years of age. Test-retest reliability of the VABS-II was conducted using sample of 414 respondents, with an interval of 13 to 34 days between interviews. For children aged birth to 21 years of age and taking into account the sex of the child, the test-retest reliability for the VABS-II ranged from 42.2% to 57.8% (Sparrow et al., 2005). The validity of the VABS-II has been rigorously tested using multiple sources of information, including test content, response process, test structure, clinical groups, and relationships to other measures. The authors report that the VABS-II has been demonstrated to be a valid measure for assessing adaptive behaviour in individuals from birth to 90 years of age (Sparrow et al., 2005).

Developmental Behaviour Checklist, Primary Carer Version (DBC-P; Einfeld & Tonge, 1992)

The DBC-P was used to evaluate perceived problem behaviour in the children with DD. The DBC-P is a 96-item parent-report questionnaire that assesses behavioural and emotional difficulties in children, adolescents, and

adults with developmental and intellectual disabilities (Einfeld & Tonge, 1992). Respondents rate each item with 0 ("not true as far as you know"), 1 ("somewhat or sometimes true"), or 2 ("very true or often true"), depending on the respondent's perception of the degree of presence of a particular behaviour. Child maladaptive behaviour was assessed using the Total Problem Behaviour score of the DBC-P. The total score is calculated by summing the scores of all items. It is an overall indicator of how severe the behavioural and emotional problems of the individual are. The authors report that a clinical "cut-off" of 44 has been established via a clinical interview sample. Scores above 44 indicate that the individual would be regarded by an expert as having "major behavioural/emotional problems" (Einfeld & Tonge, 1992).

Interrater reliability for the DBC-P was calculated using a sample of 42 pairs of mothers and fathers of children with intellectual disabilities and was found to be .80, which is considered high. Test-retest reliability for the DBC-P was evaluated using a sample of 63 pairs of parents, residential care workers, and nurses who completed the questionnaire two weeks apart. Test-retest reliability was .83, which is high. With regard to the DBC-P's ability to measure change over time, the authors report that, using a reliable change of 1.96, a score of 16.17 indicates change that is not associated with measurement error at the .05 level. Change as measured by the DBC-P was found to be highly correlated with change as rated by experienced clinicians (Einfeld & Tonge, 1992). The validity of the DBC-P was evaluated via a number of studies that examined different aspects of validity such as content validity, construct validity, concurrent validity, criterion group validity, and receiver operating characteristics (Einfeld & Tonge, 1992).

Procedure

The study received approval from the university ethics board and from the individual centres from which parents were recruited. A package of questionnaires (each containing a PSI for the mother, and PSI for the father, a DBC-P questionnaire, and other self-report questionnaires not reported here) along with a pre-paid envelope was mailed to families who consented to participate in the study. Next, parents were interviewed by either a doctoral or master's level

research assistant using the VABS-II, to estimate their child's adaptive functioning. Interviews were conducted either over the phone, at participants' homes, or at the EI centre that their child attended. Interviews ranged from 30 minutes to one hour, depending on the child's level of functioning. The research assistants administering the VABS-II received training on the measure and were shadowed on their administrations of it until they were deemed reliable, as assessed by the congruence of their ratings with those of the senior researcher shadowing them.

Approximately two and a half years after parents participated in the initial testing, members of the team contacted families to invite them to participate in a second round of data collection. For parents who agreed to continue with the study, VABS-II interviews were conducted. Following the VABS-II interview, parents were mailed packages containing forms identical to the ones they completed at Time 1 (e.g., the PSI and the DBC-P, among others), along with pre-paid return envelopes.

Results

Predicting Stress in Parents by Their Children's Behaviour Problems and Adaptive Functioning at Time 1

In order to assess the relationship between parent stress and child behaviour problems and adaptive functioning, a Pearson correlation coefficient was computed using the Time 1 sample ($n = 56$). A significant positive relationship was found between parent stress and child behaviour problems ($r(54) = .73, p < .0001$) and a significant negative relationship was found between parent stress and child adaptive functioning ($r(54) = -.27, p < .05$). A multiple regression was performed using total parent stress as the outcome variable and child behaviour problems and child adaptive functioning as the predictor variables. The model was significant and explained 55% of the variance in parent stress ($R^2 = .55, F(2, 53) = 32.15, p < .0001$). The only significant predictor of parent stress was child behaviour problems ($\beta = .71, t(53) = 7.47, p < .0001$), with child adaptive functioning contributing only marginally to the model ($\beta = -.112, t(53) = -1.28, p = .21, n.s.$).

Change in Child Behaviour Problems, Child Adaptive Functioning, and Parent Stress over Time

Given that all participants were receiving EI services, the goal of which was to improve both child and parent functioning (e.g., Guralnick 2001, 2005, 2008), we hypothesized that over time, child behaviour problems would decrease, that child adaptive functioning would improve, and that parent stress would decrease. In order to test the first part of this hypothesis, that child behaviour problems would decrease over time, a paired samples t test was conducted using those participants for whom complete data was available from Time 1 and Time 2 ($n = 21$), comparing child behaviour problems at Time 1 with child behaviour problems at Time 2. The difference was significant ($t(19) = 2.13, p < .05$), and in the expected direction, with mean problem behaviour scores decreasing from Time 1 to Time 2 (Time 1 $M = 39.71$, Time 2 $M = 32.52$).

To evaluate the hypothesis that adaptive functioning would improve over time, a paired samples t test was conducted using the Time 2 sample ($n = 21$), comparing child adaptive functioning at Time 1 with child adaptive functioning at Time 2. The difference was not significant ($t(19) = 1.95, p = .065, n.s.$).

A paired sample t test was used to examine the hypothesis that parent stress would decrease over time. Parent stress at Time 1 was compared to parent stress at Time 2. The difference was significant ($t(19) = 3.58, p = .002$), and in the expected direction, with parent stress being less at Time 2 (Time 1 $M = 261.81$, Time 2 $M = 243.48$).

Child Characteristics and Parent Stress at Time 2

Given that parent stress has been shown to be related to child characteristics, we hypothesized that this relationship would persist over time. To test the hypothesis that child behaviour problems would be related to parent stress at Time 2, Pearson's correlation coefficients were computed using the Time 2 sample ($n = 21$). Child behaviour problems were positively correlated with parent stress ($r(19) = .74, p < .0001$).

A Pearson correlation coefficient was computed using the Time 2 sample to ascertain the nature of the relationship between child adaptive functioning and parent stress. There was a significant negative correlation between child adaptive functioning and parent stress at Time 2 ($r(19) = -.52, p < .05$).

Discussion

The findings of this study underscore the importance of looking more closely at the relationship between child behaviour problems in children with DD and their parents' stress. Across disabilities, problem behaviours are frequently reported as highly related to parent stress (e.g., Hassall et al., 2005; Raina et al., 2005; Tomanik, Harris, & Hawkins, 2004; Fidler, Hodapp, & Dykens, 2000). Child adaptive functioning was also found to have a significant relationship with parent stress at both Time 1 and Time 2. However, when the effect of child behaviour was accounted for, adaptive functioning did not predict parent stress at Time 1. This result is contrary to both the guiding hypothesis and to numerous studies reporting adaptive functioning to be a significant predictor of parent stress (Plant & Sanders, 2007; Raina et al., 2005; Tomanik et al., 2004; Weiss, Sullivan, & Diamond, 2003). However, when examining these studies more closely it is apparent that different measures of both adaptive functioning and of parent stress were used, making comparison between studies difficult. Moreover, in some cases (e.g., Weiss et al., 2003) the age ranges of the individuals with DD were different from the age range used in the present study (birth to nine years of age). It is possible that with a larger and more diverse sample, adaptive behaviour may emerge as a significant predictor of parent stress.

On the other hand, Mitchell and Hauser-Cram (2009) reported that both children's adaptive functioning and their cognitive abilities were significant predictors of children's internalizing behaviours. Therefore, it is possible that there exists a relationship between children's adaptive functioning and their problem behaviour, a relationship which may lead to an indirect relationship between children's adaptive functioning and their parents' stress. This is an hypothesis which requires further investiga-

tion and would help to clarify the relationship between child behaviour problems and parent stress.

All children were receiving EI services, the goal of which is to enhance the development of young children with DD and their families. Program evaluation was not the focus of the current investigation. However, given the literature that shows a positive effect of EI for both children and parents (e.g., Guralnick 2001, 2005, 2008), it was hypothesized that participation in EI programs would reduce problem behaviours and increase adaptive functioning. Furthermore, three hypotheses were entertained: (a) children's problem behaviours would decrease over time; (b) children's adaptive functioning would improve over time; and (c) parent stress would decrease over time. The first hypothesis was supported: child behaviour problems decreased significantly from Time 1 to Time 2. Given the strong relationship between child behaviour problems and parent stress found in the present study and in others, reduction of problematic behaviours should be a key objective of intervention programs for children with DD and their families.

The hypothesis that children's adaptive functioning would improve over the course of the study was not supported. One possible explanation for this result may be found in the measure used to evaluate adaptive functioning. The VABS-II was normed as a measure of adaptive behaviour using samples of typically developing children. Thus, the standard scores are based on the norms for a typical population of children. Children with DD often develop at a much slower rate than typically developing children, and so changes in their adaptive functioning may not be accurately reflected by the standard scores of this measure (Hauser-Cram et al., 2001). An individual's raw score could increase over time, while his or her standard score actually decreases. In fact, Perry and colleagues (Perry et al., 2008) found that, using age equivalent scores on the VABS-II, children with autism improved on all domains of the measure from intake to discharge (between 4 to 48 months). However, when the children's standard scores were examined instead, Perry et al. found less improvement over time and in some areas children's standard scores decreased significantly over time.

Stress in parents of children with DD has repeatedly been found to be higher than stress in parents of typically developing children (Miodrag & Sladeczek, 2009; Quine & Pahl, 1985, 1991; Stores, Stores, Fellows, & Buckley, 1998; Tomanik et al., 2004). In the present study, 48% of the longitudinal sample of parents reported clinically elevated levels of stress at Time 1. At Time 2, this figure had dropped, with 29% of the sample reporting clinically significant stress. Even for parents whose stress remained in the clinical range at Time 2, stress levels decreased significantly over the course of the study. In fact, all but three parents experienced a decrease in their stress from Time 1 to Time 2, and overall the decrease was significant for the sample as a whole. Thus, the hypothesis of a decrease in parent stress from Time 1 to Time 2 was supported, suggesting that this sample of parents was experiencing less stress at Time 2 follow-up than they were at the beginning of the study.

However, attrition rates were high, and complete data sets were obtained from fewer than half of Time 1 participants at Time 2. It is important to note that while 21 parents were included in the present study, another 17 of the original sample were participating in some form at Time 2 (either completing the VABS-II interview but not all of the parent-report measures, completing some parent-report measures but not the VABS-II interview, or continuing to have their children participate but not themselves). Nevertheless, these results must be interpreted with caution given the limited sample size. The length of time in between testing points may have been a factor in attrition; for some participants almost three years elapsed between Time 1 data collection and Time 2. Another possible factor in the attrition from this study may be the time required to complete the measures. Many parents indicated that they did not have time for a 30 to 60 minute VABS-II interview, and others stated that the package of questionnaires sent to their homes was too much to do (in addition to the two parent-report measures used in the present study, parents were also sent six other measures to complete at the same time). It is possible that the sample of parents who continued with the study at Time 2 is qualitatively different from the sample of parents who did not complete the measures at Time 2. The Time 2 participants

may have had more free time to continue with the study, or may have been experiencing lower levels of stress or more social support, allowing them to better cope with the demands of the study. Future research should attempt to address sample size and attrition issues and find solutions that might help to mitigate their effects.

Given the long waitlists for many intervention services in Canada, future studies could examine the specific impact of interventions on children and parents by comparing families receiving services with those waiting for services. In the current study, the lack of a comparison group (such as a wait list control group) makes any definitive conclusion regarding the effect of EI on the children's development or their parents' stress difficult. However, any such attempt to control for the services received must account for additional supports or services families may access while waiting for other services. Ethically, it would be impossible to limit access to services in order to examine efficacy. Clinically, it would be very difficult to tease apart the separate influences of each type of service families may be receiving. Clear delineation of the precise supports and services accessed by the family, including the number of hours of service and types of professionals administering the service, would further illuminate the complex factors affecting parent stress and is thus an important area for future research.

As predicted, both child behaviour problems and adaptive functioning continued to be related to parent stress at Time 2. The parents of children with more behaviour problems experienced more stress at Time 2 than parents whose children had fewer behaviour problems. Likewise, parents of children with poor adaptive functioning reported more stress at Time 2 than parents whose children had better adaptive skills. This finding of a persistent relationship over time between parent stress and child behaviour is important because it supports theories of a bidirectional relationship between parents and their children (e.g., Guralnick, 2005). Researchers who are currently investigating the role of harmonious family relationships in promoting positive development in families with children with DD advocate for more evidence-based family support that pro-

motes improved behavioural outcomes for the children with DD (Mitchell & Hauser-Cram, 2009). Targeting child behaviour problems would thus appear to be a critical area of focus in interventions for families of children with DD, given the potential for reducing parent stress, and thus, reducing the negative effects that parent stress can have on child development (Ostberg, 1998; Secco et al., 2006).

Implications for Practice and Policy

The results of the present study support a growing body of research that suggests that there is a bidirectional relationship between parent stress and child development in families of children with DD (e.g., Baker et al., 2003; Friedrich et al., 1985; Guralnick, 2005; Raina et al., 2005). Effective intervention begins early and continues for a long period of time (e.g., Guralnick, 2008; Guralnick, Neville, Hammond, & Connor, 2008; Ramey & Ramey, 1992). There is a need to intervene early and quickly in order to minimize the negative effects on the family and promote positive, healthy development for both children with DD and their parents (Guralnick, 2008; Stores et al., 1998). The current study supports the idea that there is mutual interaction between child characteristics and parent stress, such that each might affect the other and both might increase over time (Baker et al., 2003; Sameroff & Chandler, 1975). This suggests that family-based interventions that focus on children's challenging behaviour are of primary importance if parent and child are to influence each other in positive ways (Bromley et al., 2004; Howlin, 1998).

The majority of parent stress research has been conducted in the United States. However, there are fundamental differences between Canada and the United States which may affect the generalizability of American results to Canada's population. For instance, in Canada it is the provincial and territorial governments that administer health and education services. There is no federal governing body to oversee these services. Thus, the services and funding to which families of children with DD have access can vary widely from province to province and territory to territory. While the current study is not large enough in either its scope or its sample size to make firm conclusions regarding changes to intervention policy,

it does shed light on the state of affairs in this country and it highlights the need for more longitudinal Canadian studies so that the situation of Canadian families of children with DD may be better understood, in order that supports and services may be tailored to the needs of Canada's population.

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Key Messages from This Article

People with disabilities: Reducing child maladaptive behaviour may lead to reduced parent stress and vice versa.

Professionals: When working with children with developmental disabilities it is important to address the needs of the whole family. Throughout the course of service provision, professionals must be aware of the reciprocal changes which may be occurring between parents and their children so that services can be adjusted and tailored to their needs.

Policy makers: When funding decisions are made, the needs of the whole family should be taken into account. Access to services aimed at reducing parent stress and remediating child maladaptive behaviour should be provided to all families of children with developmental disabilities.

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