Behaviour and emotional problems in toddlers with pervasive developmental disorders and developmental delay: associations with parental mental health and family functioning

S. Herring, K. Gray, J. Taffe, B. Tonge, D. Sweeney & S. Einfeld

Abstract

Background   Behavioural and emotional problems occur at a high rate in children and adolescents with intellectual disability, often from a young age. Some studies have indicated that children and adolescents with autism present with even higher rates. Less is known about the presentation, development and family impact of these difficulties in young children with autism. This study aimed to explore these issues in toddlers with pervasive developmental disorders (PDDs), those with delay without a PDD, and their families.

Methods   Participants were 123 children aged 20–51 months, referred to a developmental assessment clinic. Parents completed a checklist on child behavioural and emotional problems, and individual questionnaires on family functioning, their own mental health, and stress in relation to parenting their child. The child’s language and cognitive skills, adaptive functioning and behaviour were assessed by standardized measures. Measures were repeated 1 year postdiagnosis. Behavioural and emotional problems in young children with a PDD were compared with those in children with developmental delay without a PDD, and their impact on parental outcomes explored over time.

Results   Initial and follow-up measures of child behaviour and emotional problems, parent mental health problems, parent stress and family functioning were significantly correlated, providing some evidence of stability over time. Child emotional and behavioural problems contributed significantly more to mother stress, parent mental health problems, and perceived family dysfunction than child diagnosis (PDD/non-PDD), delay or gender. Compared with mothers, all fathers reported significantly less stress in relation to parenting their child.

Conclusion   Results highlighted the importance of addressing emotional and behavioural problems in very young children with autism and/or developmental delay. The need for early support and intervention for mothers, fathers and families in this context was also evidenced. As research has shown that behavioural and emotional problems persist into adolescence and young adulthood, understanding of these issues in very young children and their parents has
important implications for intervention and long-term outcomes.

Keywords behaviour and emotional problems, children, developmental delay, family, pervasive developmental disorders

Introduction


Research indicates that compared with children and adolescents with intellectual disability (ID), behaviour and emotional problems occur at particularly high rates in children and adolescents with autism (Tonge & Einfeld 2003) and in preschool children with a pervasive developmental disorder (PDD) (Gadow et al. 2004). It has been suggested that the presence of behaviour and emotional problems contributes significantly to the stress of mothers of children with ID (Hastings 2002; Beck et al. 2004), and to stress in parents of older children and adolescents with autism (Donenberg & Baker 1993; Bromley et al. 2004; Tomanik et al. 2004; Lecavalier et al. 2006). However, behaviour problems of young children with autism have been found to predict maternal but not paternal stress (Hastings et al. 2005).

In infants and toddlers with developmental delay (excluding autism), behaviour and emotional problems have been shown to be present at early age (Baker et al. 2002), persist over a 12-month period, and contribute more to parent stress than the developmental delay itself (Baker et al. 2003). It has been suggested that child behaviour problems and parenting stress are mutually escalating (Baker et al. 2003), exacerbating each other over time (Lecavalier et al. 2006; Mruzek et al. 2006). Models that suggest a reciprocal relationship between child behaviour problems, parental stress and parenting behaviour, mediated by parental negative emotional reactions and moderated by their psychological resources (Hastings 2002), are increasingly proposed. The central relationship between child behaviour problems and stress has been supported by research in children with developmental delay (Hastings 2002) and in children with autism spectrum disorders (Lecavalier et al. 2006), but has not been investigated in toddlers.

Parental variables are also important in investigating the impact of autism (Wood Rivers & Stoneman 2003; Hastings et al. 2005). Current findings suggest systemic variables such as partner mental health may also play a role in parental distress, with partner depression predicting parent stress in one study (Hastings et al. 2005). Other findings suggest a differential impact, with partner mental health predictive of mother, but not father stress (Hastings 2003). Appropriately controlled, larger sample studies are required to clarify these findings and their application to autism.

Contribution of the current study

Preliminary research highlights the important role of childhood and emotional problems in contributing to parental distress in children and adolescents with autism and ID. It also indicates significant differences in presentation and parental impact between the diagnostic groups. However, less is known about these phenomena in toddlers with autism and developmental delay. Differential impact of many of these factors across development has also been suggested (Bebko et al. 1987; Dumas et al. 1991), but little lon-
Longitudinal research has been conducted. Knowledge regarding factors contributing to parental distress in the families of very young children with autism is also in the early stages. As few appropriately controlled studies have yet to be conducted in this area, the specificity of existing findings to families of children with autism is uncertain.

To advance previous research and extend existing findings, this study therefore aimed to examine behaviour and emotional problems in toddlers with developmental delay and/or autism, along with parental mental health, stress and family functioning for both mothers and fathers. Utilizing a prospective, longitudinal design, progression of these factors over the 12 months postdiagnosis was examined.

Method
Participants
A total of 123 children aged 20–51 months were referred to an assessment clinic with suspected developmental difficulties. Children and their parents were allocated to a PDD [(Autistic Disorder, Pervasive Developmental Disorder – Not Otherwise Specified (PDD-NOS)] or non-PDD group based on the child’s diagnosis at Time 1.

Measures
Diagnosis was made according to Diagnostic and Statistical Manual of Mental Disorder (DSM)-IV (American Psychiatric Association 2000) criteria, based upon information gathered through administration of the Autism Diagnostic Interview – Revised (ADI-R; Lord et al. 1994) and the Autism Diagnostic Observation Schedule (Lord et al. 2000). The clinicians (K.G. and D.S.) arrived at a consensus diagnosis, taking into account all information obtained during the assessment. Developmental age was assessed using the Psychoeducational Profile – Revised (Schopler et al. 1990). Adaptive behaviour was assessed with the Vineland Adaptive Behaviour Scales parent interview (Sparrow et al. 1984); adaptive behaviour level indicated with the derived Adaptive Behaviour Composite (ABC) standard score. Language ability was assessed with the Reynell Developmental Language Scales (Edwards et al. 1997).

Where possible, the Wechsler Preschool and Primary Scale of Intelligence (WPPSI-III; Wechsler 2004) was administered as a measure of general intellectual ability. Of the non-PDD group, one child completed a WPPSI at Time 1; 10 at Time 2, full scale IQs ranged from 87 to 122. Of the PDD group, 14 children completed a WPPSI at Time 2, full scale IQs ranging from 60 to 125. Children were classified as developmentally delayed if their developmental age was 6 or more months below their chronological age or their WPPSI-III full scale IQ less than 70. Children were classified as having delayed language if their Reynell age-equivalent scores were 6 or more months below their chronological age. Child behavioural and emotional problems were assessed using the Developmental Behaviour Checklist – Primary Carer Version (DBC-P; Einfeld & Tonge 2002); level of disturbance indicated by the mean total behaviour problem score.

Parental mental health was evaluated with the 28-item version of the General Health Questionnaire (GHQ-28; Goldberg & Williams 1988). The GHQ total score provides an overall screening measure of mental health problems. Family functioning was evaluated with the Family Assessment Device – General Functioning Scale (FAD; Epstein et al. 1983; Byles et al. 1988). Parenting stress was measured with a stress thermometer visual analogue scale. Parents rated how stressed they felt in relation to parenting their child on a 0–4-point Likert scale, ranging from ‘no stress’ to ‘very very very stressed’. All parent questionnaires were self-report; increasing scores indicated increasing distress.

Procedure
Data were collected as part of a larger prospective community screening study for autism, involving assessment at three time points: diagnosis, 12-month postdiagnosis review and 24-month review. The current study utilized data from Times 1 and 2. All children were referred to the clinic by participating paediatricians or the Department of Human Services – Specialist Children’s Services with suspected autism and/or developmental delay. Families of children meeting selection criteria of less than 4 years of age with suspected developmental or language delay were invited for a comprehensive assessment. The first assessment session involved administration of the
ADI-R parent/caregiver interview schedule. Parent questionnaires were explained and provided to parents for completion. Parents were asked to complete the DBC-P together, and their individual FAD, GHQ and stress thermometer measures separately. The second session comprised a comprehensive assessment of the child’s language and developmental skills, adaptive functioning and behaviour and autistic symptomatology. Final diagnosis was made on the basis of clinical judgement. The third session provided diagnostic feedback to the child’s parents/caregivers, and discussion of appropriate intervention options.

This procedure was repeated in a review assessment 12 months postdiagnosis. All initial measures were repeated without a review of the child’s file or initial report. Review questionnaires were posted to parents/caregivers 2 weeks prior to the review assessment for completion. Review assessments involved a simultaneous parent interview and child assessment, with diagnostic feedback and discussion of any interventions occurring immediately following or soon after the assessment session.

Data analysis
Preliminary group comparisons were conducted in SPSS Version 12.0.1 for Windows (SPSS Inc. 2003), comprising independent and paired samples t-test and chi-square. Correlational and regression analyses were conducted in Stata 9 (StataCorp 2005). Pearson’s correlations were calculated for Time 1 and Time 2 parent outcome variables and for Time 1 and Time 2 child behaviour and emotional problems. Longitudinal regression was used to model parental outcomes as linear functions of the child’s gender, age, relative delay, behaviour problem score and diagnostic group (PDD, non-PDD). For the parental stress outcomes, partner mental health was added to the model. The ratio of developmental to chronological age was used to represent developmental age in the regression analyses. Adaptive behaviour level was not included in regressions due to a high correlation with this ratio \( r = 0.76 \). The child’s age was decomposed into average age across Times 1 and 2 (reflecting age at entry to the study) and deviation from this average at Times 1 and 2 (reflecting ageing during the study). In light of multiple comparisons, a \( P \)-value of \( <0.01 \) was considered significant.

Results
Seventy-nine mothers and 72 fathers in the PDD group, and 38 mothers and 34 fathers in the non-PDD group completed parent questionnaires at Time 1. At Time 2, six families declined or were unable to continue to participate in the study; 117 children (95.12%) remained, with 112 mothers and 105 fathers participating. Time 2 parental response rate was therefore 88.21% of original sample. Seventy-one of the children had a diagnosis of autistic disorder and 13 of PDD-NOS. Other descriptive data for the sample at Times 1 and 2 are presented in Table 1.

Independent sample t-tests revealed the PDD group had significantly lower developmental ages, \( t(121) = 4.75, P < 0.01 \), and recorded significantly lower adaptive behaviour levels, \( t(120) = 4.89, P < 0.01 \), than the non-PDD group at Time 1. Chi-square analyses with Yates’ correction for continuity indicated a significantly larger proportion of the PDD group were developmentally delayed, \( \chi^2(1, n = 123) = 9.52, P < 0.01 \). There were no significant differences between the two groups in terms of chronological age, gender distribution or language delay at Time 1.

In terms of behaviour and emotional problems, there were no differences between the PDD and non-PDD groups at Time 1, nor was there any significant change over time for either group. However, at Time 2, the PDD group had higher mean total behaviour problem score than the non-PDD group, \( t(112) = 2.67, P < 0.01 \).

Group differences on parental measures were investigated with independent sample t-tests. Mean scores on parent measures are presented in Table 2. There were no significant differences between PDD and non-PDD groups on parent variables of stress, mental health or reported family dysfunction at Time 1. At Time 2, fathers in the PDD group reported significantly more stress than those in the non-PDD group, \( t(102) = 3.13, P < 0.01 \). At Time 1, mothers reported significantly more stress than fathers in both the PDD and non-PDD groups, \( t(70) = 5.7, P < 0.01; t(32) = 5.3, P < 0.01 \). At Time 2, mothers again reported more stress than fathers for both groups, \( t(71) = 3.2, P < 0.01; t(29) = 3.3, P < 0.01 \).

The relationship between the Time 1 and Time 2 outcome variables was also explored with Pearson’s correlations. Results are presented in Table 3. All
Time 1 and Time 2 parent outcome variables were significantly positively correlated, as were Time 1 and Time 2 child behaviour and emotional problems.

Relationships between parental outcomes, partner mental health and child variables were explored with longitudinal regression analyses. Regression results are summarized in Table 4. Paternal stress was the only parental outcome not significantly positively associated with child emotional and behavioural problems. Partner mental health did not contribute significantly to either maternal or paternal stress. None of the outcomes was associated with child age at entry to the study, ageing during the study, diag-
nostic group (PDD, non-PDD), gender, nor relative developmental delay.

**Discussion**

The results of this study indicated that behaviour and emotional problems have a significant impact on parent outcome, with the exception of father stress. Overall, fathers consistently reported less stress than mothers, regardless of whether their child had a PDD or not. However, fathers of children with a PDD were significantly more stressed than other fathers at Time 2. Measures over time of child behaviour and emotional problems, parent and family distress were significantly positively correlated. Moderate to strong correlations suggested a tendency for those who scored high on these measures at Time 1 to continue to do so at Time 2. Despite non-significant changes over time in behaviour problems for both groups, at Time 2, the PDD group had significantly more behaviour and emotional problems than those with developmental delay without a PDD. No parental outcome was associated with the child’s diagnosis, nor with degree of developmental delay.

The significant contribution of emotional and behavioural problems to maternal stress and parental mental health problems is consistent with current findings with older children with PDDs (Tonge & Einfeld 2003; Hastings 2003; Lecavalier et al. 2006) and young children with developmental delay without autism (Baker et al. 2005). The greater degree of emotional and behavioural problems experienced by children with a PDD at Time 2 is also consistent with research with older children and adolescents (Tonge & Einfeld 2003). Longitudinal studies of individuals with a PDD have indicated stability in these problems during middle to late childhood (Lecavalier et al. 2006), with some decrease in emotional and behavioural disturbance as they move to adolescence (Tonge & Einfeld 2003). The current findings expand what we know to an earlier developmental period. The fact that group differences in behaviour

### Table 3: Correlations between Time 1 (T1) and Time 2 (T2) parent outcome variables and child behaviour and emotional problems

<table>
<thead>
<tr>
<th>Outcome variable</th>
<th>T1–T2 correlation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mother stress thermometer</td>
<td>0.41***</td>
</tr>
<tr>
<td>Mother GHQ total</td>
<td>0.58***</td>
</tr>
<tr>
<td>Mother FAD total</td>
<td>0.52***</td>
</tr>
<tr>
<td>Father stress thermometer</td>
<td>0.52***</td>
</tr>
<tr>
<td>Father GHQ total</td>
<td>0.59***</td>
</tr>
<tr>
<td>Father FAD total</td>
<td>0.39***</td>
</tr>
<tr>
<td>Child DBC-P mean total problem behaviours</td>
<td>0.75***</td>
</tr>
</tbody>
</table>

*P < 0.01, **P < 0.001, ***P < 0.0001.

DBC-P, Developmental Behaviour Checklist – Primary Carer Version; FAD, Family Assessment Device – General Functioning Scale; GHQ, General Health Questionnaire.

### Table 4: Unstandardized coefficients for regressions of maternal and paternal outcome variables on child variables

<table>
<thead>
<tr>
<th>Child variables</th>
<th>Stress</th>
<th>GHQ</th>
<th>FAD</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Mother</td>
<td>Father</td>
<td>Mother</td>
</tr>
<tr>
<td>Female gender</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Age at entry</td>
<td>-0.26</td>
<td>-0.34</td>
<td>1.02</td>
</tr>
<tr>
<td>Ageing during study</td>
<td>-0.02</td>
<td>0.02</td>
<td>-0.29</td>
</tr>
<tr>
<td>Development to chronological age ratio</td>
<td>-0.05</td>
<td>-0.37</td>
<td>-2.79</td>
</tr>
<tr>
<td>DBC-P mean TBPS</td>
<td>1.27*</td>
<td>0.28</td>
<td>10.11*</td>
</tr>
<tr>
<td>PDD</td>
<td>-0.08</td>
<td>0.16</td>
<td>1.96</td>
</tr>
<tr>
<td>Partner GHQ</td>
<td>0.01</td>
<td>0.01</td>
<td></td>
</tr>
<tr>
<td>(Constant)</td>
<td>1.94*</td>
<td>0.09</td>
<td>58.39*</td>
</tr>
</tbody>
</table>

*P < 0.01.

DBC-P, Developmental Behaviour Checklist – Primary Carer Version; FAD, Family Assessment Device – General Functioning Scale; GHQ, General Health Questionnaire; PDD, pervasive developmental disorder; TBPS, total behaviour problem score.

© 2006 The Authors. Journal Compilation © 2006 Blackwell Publishing Ltd
and emotional problems were significant only at Time 2 suggests that consistently reported differences in older children become more apparent over time.

Partner mental health problems were not a significant contributor to mother or father stress. This contrasts with previous findings with smaller, autism-specific samples (Hastings et al. 2005). Across a larger sample of children with broader developmental difficulties, child behaviour and emotional problems appear to be a more important factor.

Study strengths and limitations

Methodological strengths of the current study included the sample age range of 20–51 months, extending current knowledge in this area to younger children. The prospective, longitudinal design incorporated reassessments at 12 months post diagnosis, providing needed insight into the progression of behaviour and emotional problems, parent distress, and their relationship over time. Finally, children with developmental delay without autism were included as controls, allowing PDD-specific conclusions and clarification of previous findings. In terms of limitations, the collapse of separate PDD types (autism and PDD-NOS) into a single group may reduce the diagnostic specificity of the findings (Lecavalier et al. 2006). However, there were only 13 children in the PDD group with a diagnosis of PDD-NOS rather than Autistic Disorder, and little difference in psychiatric comorbidity across PDD types in young children has been found (Gadow et al. 2004). A further limitation was the size of the non-PDD sample; despite the fact that consecutive referrals were included, the final sample comprised more children with a PDD than without. Finally, parental emotional states may have influenced their perceptions of their child’s emotional and behavioural problems, although such an effect is probably modified by the fact of the parents completing this measure together. Parental distress measures were completed in conjunction with measures of their child’s problems. This potential confound could have been avoided through the use of an independent report, such as a teacher or child worker; however, young children are often not in educational or intervention programmes when first assessed, making this difficult.

Conclusion

Results from this study highlight the importance of addressing emotional and behavioural problems in very young children with autism and/or developmental delay. Such behaviours should be a target for early intervention, and existing evidence supports intervention for behaviour problems (e.g. Gavidia-Payne & Hudson 2002; Hudson et al. 2003). Reduction of child behaviour problems has the potential to ameliorate parental stress, mental health problems and family dysfunction. As studies have shown that behavioural and emotional problems in autism and persist into adolescence and young adulthood (Tonge & Einfeld 2003), understanding of these issues in very young children and their parents has important implications for intervention and long-term outcomes. An emphasis on providing early intervention for behaviour and emotional problems, along with additional support, education and skills training for parents, is justified.

Acknowledgements

This research was funded by the National Health and Medical Research Council and the Australian Research Council, Australia. The authors would like to thank Erin Mooney for her assistance in data collection, and participating children and their families for their support.

References


StataCorp. (2005) *Stata Statistical Software: Release 9*. StataCorp LP, College Station, TX.


Accepted 18 July 2006