

## Different, difficult or distinct? Mothers' and fathers' perceptions of temperament in children with and without intellectual disabilities

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### Abstract

**Background** Can ratings of temperament be a way of identifying young children with intellectual disabilities (ID) who are at risk for being experienced as difficult? We aimed to explore parents' reports of temperament in their young children with or without ID, as well as positive and negative impact of the child on parents.

**Method** Mothers and fathers of 55 children recently diagnosed with ID and 183 age-matched typically developing (TD) children completed the EASI Temperamental Survey and two scales of the Family Impact Questionnaire measuring positive and negative impact of the child on parents.

**Results** Parents rated children with mixed ID/DD (developmental delay) as shyer and more impulsive, and less active and sociable when compared with TD children. Children with mixed ID/DD were also reported to have more negative and less positive impact on the family compared with the TD group. In subgroup analyses, children with Down syndrome and cerebral palsy/motor impairment were described as having less negative impact on

parents and were described as low in negative emotionality. Children with autism spectrum disorder (ASD), ID/DD nos and other less common diagnoses had a similar pattern of temperament with high emotionality, shyness and impulsivity, and low activity and sociability. Parents of children with ASD and ID/DD reported the highest level of negative impact.

**Conclusions** Temperamental characteristics such as high negative emotionality and impulsivity, which can be identified earlier than behavioural problems, could be indicators of negative impact on parents of young children with ID. Despite great variability in temperament among children with mixed ID/DD, results indicated common temperamental characteristics among children with ASD, ID/DD and other diagnosis.

**Keywords** temperament, intellectual disability, parent

Parents who find out that their child has an intellectual disability (ID) react to this insight in a wide variety of ways. Questions and uncertainties arise regarding how the future of the child and the family will be affected by the disability. The trajectories of some ID are fairly well known, while others are yet unexplored. Health professionals are often unable to offer specific information about a child's

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prognosis (Graungaard & Skov 2007) because of a majority of children not receiving a specific diagnosis that explains either aetiology or prognosis (Curry *et al.* 1997; Verri *et al.* 2004; Henderson & Dick 2005). Can ratings of temperament in children with ID be clinically relevant in identifying children at risk for being experienced as difficult?

Parents of children with ID, and mothers in particular, experience somewhat higher levels of parenting stress and depression (Singer 2006), which has been found to be, at least in part, explained by the behavioural problems that are overrepresented among children with ID already at age 5 years (Hastings 2002; Baker *et al.* 2005; Hassall *et al.* 2005; Herring *et al.* 2006). The main body of research within this area has tended to focus on atypical or problematic behaviour in children with ID, while the role of the wide range of behaviours described as temperament has not yet been explored in terms of impact on parents. Are there specific temperamental traits among children with ID who are experienced as having positive or negative impact on the parents, and consequently affect level of parenting stress?

In the research field of temperament, there is certain agreement about the fact that a combination of heredity and factors of prenatal environment affect infant temperament, but another important influence is developmental immaturity (Nigg 2006). Temperament has been found to follow certain developmental paths and change over time, but it will rarely change from one extreme to another (Janson & Mathiesen 2008). In studies of temperament in children with ID, different measures of temperament are used, and samples tend to differ in terms of diagnosis, age and developmental delay (DD), complicating straightforward comparisons between studies.

Most attention has so far been directed towards investigating the temperament of children with Down syndrome (DS) (Bridges & Cicchetti 1982; Nygaard *et al.* 2002; Fidler *et al.* 2006; Gartstein *et al.* 2006; Stoneman 2007). There are also informative studies on temperament in children with autism (Konstantareas & Stewart 2006), fragile-X syndrome (Bailey *et al.* 2000; Kau *et al.* 2000; Shanahan *et al.* 2008) and Williams syndrome (Klein-Tasman & Mervis 2003). Homogeneity of temperament within groups varies depending on

type of diagnosis, and in some diagnoses (e.g. autism) syndrome-specific behavioural characteristics covary with temperamental traits (Konstantareas & Stewart 2006).

When children with ID of mixed aetiology from special schools were compared with children from regular schools, parents rated children from special schools as being less sociable, while teachers rated these children as more emotional compared with the typically developing (TD) children (Zion & Jenvey 2006). Subgroup comparisons of pre-school children with autism, DS, mixed ID and TD children on level of 'difficult temperament' (low rhythmicity, approach, adaptability, and high withdrawal, intensity and mood) indicated that parents experienced children with autism as most difficult, followed by children with mixed ID, DS and TD (Kasari & Sigman 1997). However, the concept of difficult temperament has been criticised and may not apply to children with ID. For instance, Marcovitch *et al.* (1987) found that children with ID were experienced as difficult by their mothers if they had high activity and intensity, low adaptability, and high approach, which differs from what is commonly considered to be difficult temperament.

It is important to attend to the distinction between temperament and behaviour problems, which is not clear-cut. There is some overlap between measures of temperament and behavioural problems; nonetheless do they measure something quite distinct (De Pauw *et al.* 2009). Temperament could be considered a risk factor for developing psychopathology (Frick 2004) as certain temperamental traits (e.g. emotionality, sociability and shyness) predict both internalising and externalising problems (De Pauw *et al.* 2009). In addition to providing important information about the impact of child factors on parents, the understanding of the role of child temperament could make early identification and prediction of parenting stress possible.

In the present study we were interested in mothers' and fathers' descriptions of child behaviour and child's impact on parents. We were particularly interested in capturing parents' descriptions of their child at an early age and consequently approached parents who recently had found out about their child's diagnosis. Previously, ratings of child characteristics have been found to vary between different types of informants, and agree-

ment between informants who differ in their relationship to the child (i.e. teachers, parents, psychologists) tend to be lower than between informants who are in a similar relation to the child, indicating that perceptions of child behaviour may be relationship-specific (Achenbach *et al.* 1987; Seifer *et al.* 2004). In the present study the aim was to investigate mothers' and fathers' subjective descriptions of child characteristics, and what positive and negative impact the child has on his or her parents.

### Aims

The present study focused on parents' descriptions and experiences of behaviour in children aged 0–6 years with and without ID. There were three aims of this study: the first aim was to examine differences and similarities in parents' descriptions of child temperament, and what positive and negative impact young children with or without ID have on their parents. The second aim was to compare parents' descriptions of child temperament as well as positive and negative impact of subgroups defined by diagnosis. The third aim was to investigate differences between mothers' and fathers' ratings, as well as mother–father agreement on temperament in children with and without ID.

### Method

#### Participants and procedure

Following approval from the National Ethics Committee, mothers and fathers of 55 children with ID/DD were recruited at their initial contact with clinics providing services for children with disabilities. The aim in recruiting was to sample a heterogeneous group representing the variety in the population of parents of children with ID/DD with the common experience of recently having found out that their child has an ID/DD. The criteria for inclusion were that (1) the child was diagnosed with ID/DD; (2) the diagnostic process of the ID of the child had begun no more than 6 months before data collection started; (3) the child was aged between 0 and 6 years; (4) the family was living in the region of Västergötaland in Sweden; and (5) the parents could communicate in Swedish. At the time

of initial contact, parents of approximately 150 children with ID/DD were informed about the study. Of the 68 families who mailed their interest in participating in the research study, 13 families were excluded as they did not meet the criteria for inclusion of the present study, or had returned incomplete questionnaires. Complete questionnaires were returned from 55 mothers (mean age 34.26 years, SD = 5.36) and 44 fathers (mean age 35.44 years, SD = 6.09) of 55 children (response rate 36.7%).

All children in the mixed ID/DD group had been diagnosed with either ID/DD (if the child was too young to have received a diagnosis of ID), and some of them had a more specific diagnosis. The children were aged between 5 months and 79 months (mean age 37.42 months, SD = 24.15) and 61.8% were boys (Table 1). Information about child diagnosis was collected from parents, and the primary diagnoses of children (in addition to ID/DD) were: DS ( $n = 9$ ), intellectual disability/delay nos (ID/DD) ( $n = 14$ ), autism spectrum disorder (ASD) ( $n = 12$ ), cerebral palsy/motor impairment (CP/MI) ( $n = 5$ ) and 'other diagnoses' including uncommon chromosomal abnormalities or syndromes ( $n = 15$ ). The diagnostic groups differed significantly in terms of age  $F(4,50) = 14.35$ ,  $P < 0.001$  (Table 4). Tukey's HSD *post hoc* tests showed that, with an alpha level of  $P < 0.05$ , children with DS were significantly younger than children with ID/DD, ASD and other diagnosis, and children with ASD were significantly older than children with CP/MI and other diagnosis. The distribution between diagnostic groups in the sample may differ from the population of children with ID/DD, with fewer children with ASD than expected, and a slight overrepresentation of children with DS, perhaps because of parents of young children still being on parental leave. Recruitment was carried out via health services and no information about families that chose not to participate was forwarded to the research team in order to preserve anonymity of non-respondents. Questionnaires excluded from analysis were either incomplete (from parents of very young children), or children were older than 6 years.

A control group consisting of parents of TD children was recruited through the SPAR register (a national register of all individuals in Sweden). A total of 490 parents of TD children were contacted

**Table 1** Demographic data of ID and control groups

	ID ( <i>n</i> = 55)	Control ( <i>n</i> = 178)	<i>t</i> or chi square*
<b>Child</b>			
Gender (% boys)	61.8%	55.2%	0.76
Age in months (SD)	37.42 (24.15)	41.30 (20.54)	<b>1.08</b>
<b>Parent</b>			
Mother age, years (SD)	34.23 (5.36)	34.16 (5.27)	<b>0.11</b>
Father age, years (SD) <sup>†</sup>	35.44 (6.09)	36.80 (5.72)	<b>-1.37</b>
Mother cohabiting with biological father	89.1%	89.8%	3.47
Father cohabiting with biological mother <sup>†</sup>	100%	95.7%	0.92
Mother education (% university degree)	30.2%	40.6%	4.24 <sup>‡</sup>
Father education (% university degree) <sup>†</sup>	24.1%	27.5%	3.11 <sup>‡</sup>
Mother income <sup>§</sup>	€18 000–23 999	€18 000–23 999	1.77 <sup>¶</sup>
Father income <sup>§</sup>	€24 000–29 999	€24 000–29 999	8.29 <sup>¶</sup>

There were no significant differences between the ID and control groups on the variables in Table 1.

\* The *ts* are in boldface.

<sup>†</sup> Father *n* = 44 in ID group and *n* = 149 in control group.

<sup>‡</sup> Chi square comparing all educational subgroups.

<sup>§</sup> Median annual income.

<sup>¶</sup> D.f. = 7.

ID, intellectual disability.

and asked to participate in the study. Out of these, 178 mothers (mean age 34.16 years, SD = 5.27) and 149 fathers (mean age 36.80 years SD = 5.72) of 183 children returned complete questionnaires. Mean age of children in the control group was 41.3 months, SD = 20.54 and 55.2% were boys. The ID/DD and control groups were matched on child gender, age and living area. Parents' characteristics such as age, level of education and annual professional income did not differ significantly between groups (Table 1), which seems representative in a Swedish context (Olsson & Hwang 2003).

Parents were mailed a questionnaire each and were instructed to complete this individually and return the questionnaire in separate prepaid envelopes included in the mailing. If parents were separated, the parent who received the survey was asked to deliver the questionnaire to the other parent. Reminders with new questionnaires were sent out on two occasions to parents who had not answered, at 2 and 4 weeks following the first mailing. Each parent received a gift voucher equivalent to 10 euros when completed surveys had been returned.

## Instrument/measure

### *EASI Temperament Survey*

In the present study the Swedish parent-rated version of the EASI Temperamental Survey (Buss & Plomin 1984; Hagekull & Bohlin 1990) was used, which has been standardised for children between the age of 1 and 9 years. The EASI (Buss & Plomin 1975, 1984) contains the sub-scales Emotionality – 'distress, or the tendency to become upset easily and intensely' (Buss & Plomin 1984, p. 54), Activity – intensity and speed of activity, Shyness – being inhibited and feeling awkward in new social situations, Sociability – seeking and preferring the presence of others to being alone, Impulsivity – inhibitory control, decision time and persistence in ongoing tasks (Strelau 1998). The scales measuring Impulsivity and Shyness were removed by Buss & Plomin (1984) because of insufficient evidence of heredity (Daniels & Plomin 1985; Strelau 1998). In the present study we included both scales as these have been found to be related to externalising and internalising problems (Schmitz *et al.* 1999; Leve *et al.* 2005) and children with ID as a group has

been described as displaying higher than normal levels of behavioural problems (Hassall *et al.* 2005).

The EASI contains 25 items; five items in each sub-scale, rated on a 5-point scale where 1 corresponds to 'not characteristic or typical of your child', and 5 corresponds to 'very characteristic or typical of your child'. The EASI has shown good psychometric properties in previous studies in terms of internal consistency and inter-rater agreement (Rowe & Plomin 1977; Boer & Westenberg 1994; Mathiesen & Tambs 1999) and is easy to administer. In the present study mean internal consistency for the EASI, using the entire sample was 0.733. Cronbach's alpha for the sub-scales were as follows: Emotionality 0.727, Activity 0.791, Shyness 0.784, Sociability 0.645 and Impulsivity 0.720. All scales except Sociability reached the cut-off level of  $\geq 0.70$  which is considered to be an acceptable level of internal consistency. Alpha for subgroups of mothers/fathers, and parents of children with/without ID were investigated, but did not differ significantly from alpha of the total group.

#### Family Impact Questionnaire

Two sub-scales from the Family Impact Questionnaire (FIQ) (Donenberg & Baker 1993) were used measuring the child's positive and negative impact on the parent. The negative impact scale contained six items, and the scale measuring positive impact contained eight items. Parents were instructed to assess the target child's impact on the family compared with other children of the same age and their parents on a 4-point scale ranging from (0) *not at all* to (3) *very much*. Cronbach's alpha for the negative impact scale was 0.74, and for the positive impact scale 0.80.

#### Data analysis

Only parents' who completed at least 80% of the items of each sub-scale were included in the analyses. Because of the requirement of paired data in some statistical procedures (i.e. repeated measures ANOVA), *n* varies between test results as there were some families where only one parent had completed the questionnaire. These single responses were included in analyses that did not require paired data.

#### Comparison of means

Analyses of group differences in child temperament between the ID/DD and control groups, as well as differences in ratings between mothers and fathers, were carried out using repeated measures analysis of variance (ANOVA) and *post hoc t*-tests or Tukey's HSD. In comparisons of the ID/DD and control groups, as well as diagnostic subgroups, the mean of mother–father ratings were used. All data analyses were performed using SPSS version 15.0.

#### Agreement

Level of agreement between mothers' and fathers' ratings was investigated through analyses of absolute and global agreement, and correlations. Mothers' and fathers' ratings were checked for percentage of pairwise absolute agreement on each item. Global agreement was defined as percentage of mothers' and fathers' ratings on an item that did not differ more than  $\pm 1$ . The Pearson's product moment correlation was used to evaluate linear relationship between mother's and father's ratings. Significance of group differences in correlations was tested using Internet software (Preacher 2002).

## Results

### Parents' ratings of children with or without ID

The first aim was to examine differences and similarities in parents' descriptions of child temperament, and what positive and negative impact young children with or without ID have on their parents. Table 2 provides the temperament ratings of mothers and fathers and the mean of mother–father ratings for each group. There was a significant interaction effect for temperament  $\times$  group,  $F(3.282, 515.243) = 17.193$ ,  $P < 0.0001$ ,  $\eta^2 = 0.10$  which is illustrated in Fig. 1. (The degrees of freedom were corrected according to Huynh-Feldt as the assumption of sphericity was not fulfilled.) *Post hoc* independent samples, *t*-tests were performed for each temperament scale comparing average mother–father means of the two groups with the alpha level set to 0.01. Results indicated that when compared with the control group, children with ID/DD were rated significantly higher on Shyness and Impulsivity, and significantly lower on

EASI scales	ID		TD		d.f.	t
	n	Mean (SD)	n	Mean (SD)		
Emotionality						
Mother	51	3.06 (0.81)	171	2.97 (0.72)		
Father	40	3.14 (0.84)	137	3.03 (0.71)		
M-F mean	53	3.09 (0.77)	178	3.00 (0.65)	229	-0.939
Activity						
Mother	49	3.55 (1.04)	170	4.00 (0.63)		
Father	39	3.61 (0.99)	137	4.05 (0.62)		
M-F mean	51	3.55 (0.95)	177	4.02 (0.57)	60.81 <sup>†</sup>	3.37**
Shyness						
Mother	47	2.67 (1.01)	168	2.08 (0.68)		
Father	37	2.65 (0.92)	137	2.13 (0.61)		
M-F mean	50	2.67 (0.93)	177	2.09 (0.61)	61.38 <sup>†</sup>	-4.14***
Sociability						
Mother	49	3.21 (0.84)	169	3.77 (0.60)		
Father	37	3.21 (0.67)	136	3.69 (0.61)		
M-F mean	50	3.22 (0.71)	177	3.73 (0.57)	225	5.19***
Impulsivity						
Mother	48	3.14 (0.78)	167	2.67 (0.67)		
Father	37	3.10 (0.84)	136	2.78 (0.65)		
M-F mean	51	3.11 (0.72)	175	2.71 (0.61)	224	-4.00***
FIQ-negative						
M-F mean	55	0.80 (0.52)	183	0.58 (0.36)	70.79 <sup>†</sup>	-2.952*
FIQ-positive						
M-F mean	55	2.22 (0.45)	183	2.41 (0.32)	71.44 <sup>†</sup>	2.93*

**Table 2** Parents' ratings of child temperament and family impact

\*  $P \leq 0.005$ , \*\*  $P = 0.001$ , \*\*\*  $P < 0.001$ .

<sup>†</sup> Equal variances not assumed as Levene's test showed significant differences in variances in this variable.

FIQ, Family Impact Questionnaire; ID, intellectual disability; M-F, mother-father; TD, typically developing.

Activity and Sociability. There was no significant difference between groups on Emotionality. Means, standard deviations, *t*-values and significance levels for these data are shown in Table 2.

To further investigate how these differences in terms of temperament were experienced by parents, the FIQ scales measuring the child's positive and negative impact on the parents were used. As shown in Table 2, children with ID/DD were rated higher on the negative scale and lower on the positive scale when compared with TD children. Table 3 shows the relationship between the FIQ scales and the EASI scales. With an alpha level of 0.01, negative impact on parents was positively correlated with Emotionality in the ID/DD and TD groups, and with Impulsivity in the ID/DD group. Positive

impact was negatively correlated with Emotionality for TD children and Impulsivity for children with ID/DD.

#### Parents' ratings of children divided by primary diagnosis

The second aim was to compare parents' descriptions of child temperament as well as positive and negative impact of subgroups as well as positive and negative impact of subgroups defined by diagnosis. Children with ID were divided into subgroups according to their primary diagnosis as stated by the parents. Diagnostic subgroups differed significantly on all the EASI scales: Emotionality  $F(4,48) = 6.45$ ,  $P = 0.000$ ,  $\eta^2 = 0.35$  ( $\omega^2 = 0.29$ ), Activity  $F(4,46) = 2.60$ ,  $P = 0.048$ ,  $\eta^2 = 0.18$

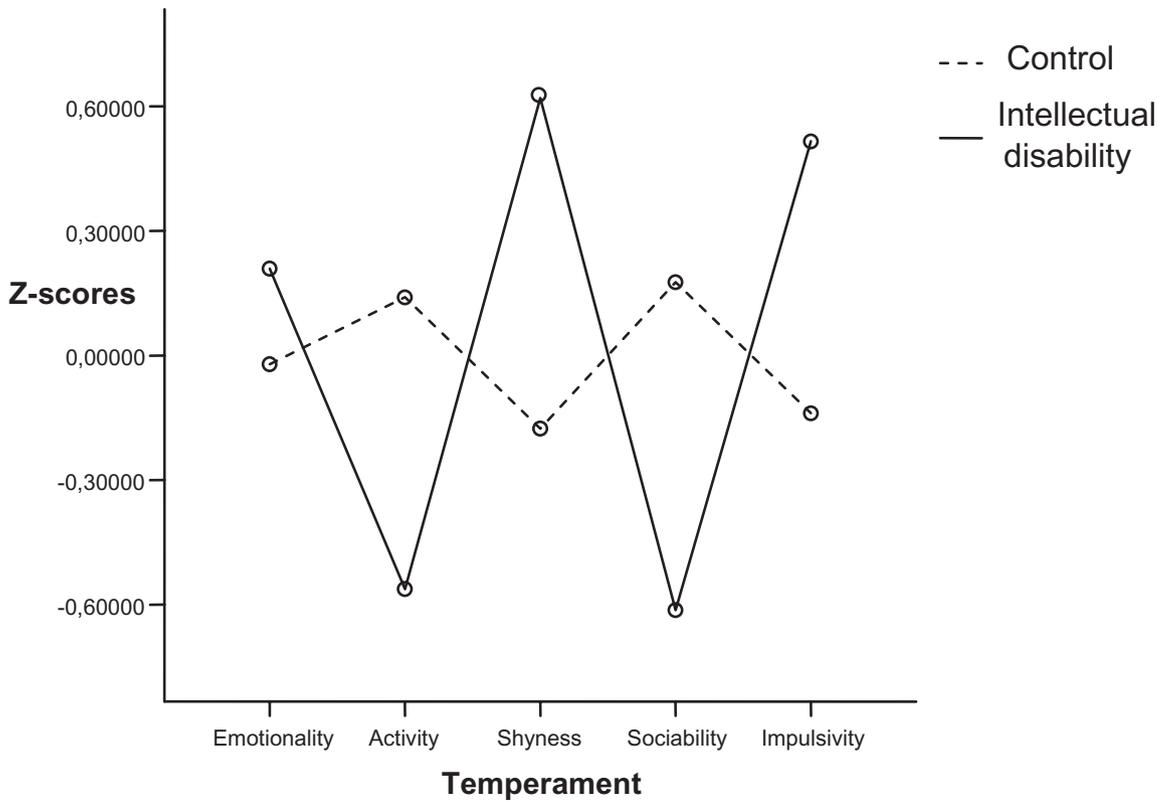


Figure 1 Temperament in children with and without ID. ID, intellectual disability.

EASI scales	Group	n	FIQ-negative	FIQ-positive
Emotionality	Control	178	0.262**	-0.242**
	ID	53	0.479**	-0.338*
Activity	Control	177	0.032	-0.001
	ID	51	0.188	-0.042
Shyness	Control	177	0.058	-0.083
	ID	50	0.320*	-0.348*
Sociability	Control	177	-0.089	0.076
	ID	50	-0.197	0.265
Impulsivity	Control	175	0.159*	-0.140
	ID	51	0.434**	-0.365**

Table 3 Correlations between child temperament positive and negative impact

\*  $P < 0.05$ , two-tailed, \*\*  $P < 0.01$ , two-tailed.

FIQ, Family Impact Questionnaire; ID, intellectual disability.

( $\omega^2 = 0.11$ ), Shyness  $F(4,45) = 2.724$ ,  $P = 0.041$ ,  $\eta^2 = 0.20$  ( $\omega^2 = 0.12$ ), Sociability  $F(4,45) = 10.874$ ,  $P = 0.000$ ,  $\eta^2 = 0.49$  ( $\omega^2 = 0.44$ ) and Impulsivity  $F(4,46) = 6.919$ ,  $P = 0.000$ ,  $\eta^2 = 0.38$  ( $\omega^2 = 0.32$ ). Mean ratings of the ID subgroups are displayed in

Table 4. Tukey *post hoc* comparisons of the five subgroups on each temperament scale indicate the following significant differences; children with DS had lower levels of Emotionality than children with ID/DD nos ( $P = 0.003$ ), ASD ( $P = 0.001$ ) and other

**Table 4** Parents' ratings of temperament by diagnosis and age group

Diagnosis	Intellectual disability (ID)					Typical development (TD)		
	DS (n = 9)	CP/MI (n = 5)	ID (n = 14)	ASD (n = 12)	OD (n = 14)	TD (n = 57)	TD (n = 58)	TD (n = 62)
Mean age (years) (SD)	7.67 (1.66)	24.60 (8.08)	48.64 (17.87)	59.33 (9.81)	31.53 (25.59)	17.90 (7.91)	41.50 (5.84)	64.50 (7.37)
EASI								
Emotionality	2.22 (0.43)	2.50 (0.37)	3.32 (0.62)	3.48 (0.66)	3.25 (0.80)	3.02 (0.63)	3.01 (0.65)	2.95 (0.68)
Activity	4.19 (0.52)	2.92 (1.04)	3.89 (0.85)	3.45 (0.70)	3.18 (1.15)	4.11 (0.59)	3.97 (0.55)	3.98 (0.58)
Shyness	2.01 (0.55)	2.18 (0.81)	2.61 (1.09)	3.28 (0.53)	2.67 (0.99)	2.16 (0.54)	2.16 (0.58)	1.99 (0.68)
Sociability	4.06 (0.56)	3.76 (0.32)	3.29 (0.42)	2.47 (0.63)	3.32 (0.56)	3.72 (0.50)	3.71 (0.57)	3.73 (0.62)
Impulsivity	2.43 (0.28)	3.04 (0.64)	3.72 (0.67)	3.18 (0.62)	2.79 (0.56)	2.98 (0.51)	2.61 (0.67)	2.55 (0.55)
FIQ-negative	0.43 (0.25)	0.28 (0.07)	1.01 (0.56)	1.03 (0.42)	0.81 (0.53)	0.46 (0.33)	0.60 (0.34)	0.67 (0.39)
FIQ-positive	2.31 (0.36)	2.61 (0.25)	2.13 (0.44)	2.12 (0.49)	2.22 (0.50)	2.43 (0.41)	2.02 (0.50)	2.20 (0.46)

ASD, autism spectrum disorder; CP/MI, cerebral palsy/motor impairment; DS, Down syndrome; FIQ, Family Impact Questionnaire; OD, other diagnoses.

diagnoses ( $P = 0.007$ ). Children with CP/MI differed significantly from children with ASD ( $P = 0.046$ ). No significant differences were found when performing *post hoc* comparisons on the scale Activity, because of the conservative characteristics of Tukey's HSD. The ASD group were rated significantly higher on Shyness when compared with children with DS ( $P = 0.043$ ), and lower than all other groups on the Sociability scale, DS ( $P = 0.000$ ), CP/MI ( $P = 0.000$ ), ID/DD ( $P = 0.002$ ) and other diagnoses ( $P = 0.001$ ). Children with ID/DD had the highest level of Impulsivity out of all diagnostic subgroups, and differed significantly from children with DS ( $P < 0.000$ ) and other diagnosis ( $P = 0.002$ ).

Children's positive and negative impact on parents was investigated for the diagnostic subgroups (Table 4). The level of parents' positive emotions did not differ significantly between diagnostic subgroups  $F(4,50) = 1.36$ ,  $P = 0.260$ ,  $\eta^2 = 0.10$ . However, group means did differ in terms of negative impact  $F(4,50) = 4.46$ ,  $P = 0.004$ ,  $\eta^2 = 0.26$ . Tukey's *post hoc* tests revealed that children with DS were rated as having less negative impact than children with ASD ( $P = 0.039$ ), and children with ID/DD ( $P = 0.039$ ). Children with CP/MI were also rated as less negative when compared with the ASD ( $P = 0.030$ ) and ID/DD ( $P = 0.03$ ) groups.

Temperament is known to be related to age or maturity to some extent (Janson & Mathiesen 2008), and diagnostic subgroups in the present study were found to differ in terms of chronological age. To investigate how chronological age may be related to temperament, data from the TD children were further analysed by dividing the control group into three equally sized age groups with the mean ages of 17.90 months (SD = 7.91, range 4–32 months), 41.50 months (SD = 5.84, range 33–52 months) and 64.50 months (SD = 7.37, range 53–79 months). The age groups did not differ significantly on the scales Emotionality, Activity, Shyness or Sociability. However, there were differences in Impulsivity between age groups of TD children  $F(2,171) = 9.06$ ,  $P < 0.001$ ,  $\omega^2 = 0.09$ . The youngest group of TD children (aged 4–32 months) was described as having a higher level of Impulsivity when compared with the two older groups of TD children, aged 33–52 months ( $P = 0.003$ ) and 53–79 months ( $P = 0.000$ ). The age groups of TD children were found to differ in terms of negative impact on parents  $F(2,179) = 5.48$ ,  $P = 0.005$ ,  $\eta^2 = 0.06$ , but not in terms of positive impact  $F(2,179) = 2.11$ ,  $P = 0.124$ ,  $\eta^2 = 0.02$ . *Post hoc* comparisons revealed that the oldest group of TD children was rated as having more negative impact than the youngest children ( $P = 0.004$ ).

Although negative impact on parents appeared to increase somewhat with higher age in TD children and subgroups of children with ID, this analysis suggested that age probably could not in itself explain the magnitude of difference found in the ID group. Effect size for comparisons between diagnostic subgroups within the ID/DD group was larger and mean differences were more extensive compared with differences between age groups within the group of TD children. The lower level of impulsivity found in younger TD children did not correspond with differences between diagnostic groups when taking age into account.

#### Differences and agreement between mothers' and fathers' ratings

The third aim was to investigate differences between mothers' and fathers' ratings, as well as mother–father agreement on temperament in children with and without ID. When comparing mothers' and fathers' ratings of child temperament in the complete sample or in the ID/DD and TD groups separately, no significant differences were found because of parent gender  $F(1,157) = 2.173$ ,  $P = 0.142$ ,  $\eta^2 = 0.01$ , and no interaction effect was found for parent gender  $\times$  group  $F(1,157) = 0.031$ ,  $P = 0.860$ ,  $\eta^2 = 0.00$ . Similarly, negative and positive emotions towards the child did not differ in terms

of parent gender,  $F(1,171) = 0.51$ ,  $P = 0.475$ ,  $\eta^2 = 0.00$ , or gender  $\times$  group  $F(1,171) = 0.59$ ,  $P = 0.443$ ,  $\eta^2 = 0.00$ .

When estimating absolute and global agreements between mothers' and fathers' ratings on each of the 25 items, there were no significant differences found between the ID/DD and control groups. Level of absolute agreement was 45.8% in the ID/DD group and 46.5% in the control group, and global agreement (disagreement of mother's and father's scores that did not exceed  $\pm 1$ ) was 83.8% for the ID/DD group and 86.8% for controls. This means that parents on average disagreed on 16.2% of the items in the ID/DD group and 13.2% in the control group. The two groups did not differ significantly in terms of absolute  $t(171) = 0.206$ ,  $P = 0.837$  or global agreement  $t(171) = 1.543$ ,  $P = 0.125$ .

Correlations between mothers and fathers in each group were significant with  $P < 0.01$  on the five temperament scales (Table 5). Correlations between mothers' and fathers' ratings in the ID/DD group were somewhat higher than in the control group; Emotionality  $Z = -0.97$ ,  $P = 0.334$ , Shyness  $Z = -2.32$ ,  $P = 0.020$ , Sociability  $Z = -1.69$ ,  $P = 0.091$  and Impulsivity  $Z = -0.91$ ,  $P = 0.361$ , but only significantly higher on Activity  $Z = -2.70$ ,  $P = 0.007$  (alpha level adjusted according to Bonferroni,  $P < 0.01$ ). Correlations between mothers' and fathers' ratings of children with ID/DD were high

**Table 5** Correlations of mothers' and fathers' ratings

EASI scales	Group	<i>n</i>	Pearson's correlation	Between-subjects MS	Within-subjects MS
Emotionality	Control	130	0.548**	0.811	0.236
	ID	38	0.664**	1.128	0.232
Activity	Control	130	0.507**	0.582	0.190
	ID	37	0.793**	2.025	0.231
Shyness	Control	128	0.512**	0.597	0.192
	ID	34	0.774**	1.691	0.210
Sociability	Control	136	0.543**	0.526	0.157
	ID	36	0.734**	1.099	0.187
Impulsivity	Control	128	0.525**	0.663	0.210
	ID	34	0.645**	1.181	0.248

\*\*  $P < 0.01$ , two-tailed.

ID, intellectual disability; MS, mean square.

(between 0.71 and 0.90) on Activity, Shyness and Sociability; and moderate (between 0.51 and 0.70) on Emotionality and Impulsivity. Mother–father correlations in the control group were moderate on all scales. The differences in correlations between groups were related to the higher variance in ratings of children with ID/DD compared with TD children which is reflected in higher between-subjects mean square as shown in Table 5.

## Discussion

Differences and similarities in parents' descriptions of temperament and impact of young children with or without ID were investigated. As a group children with ID/DD were described as being shyer and more impulsive, and less active and sociable when compared with TD children, but no difference was found in terms of emotionality. When comparing subgroups according to primary diagnosis, distinct characteristics emerged; children with DS were rated as lower in negative emotionality than children with ID/DD, ASD and other uncommon diagnosis. Children with ASD were generally rated as less sociable compared with other subgroups and shyer than children with DS. Children with ID/DD as primary diagnosis appeared to be more impulsive than children with DS or other uncommon diagnoses. TD children were rated as having more positive and less negative impact on their parents than children with ID/DD. Diagnostic subgroups differed in terms of negative impact, with children with ASD and ID/DD being rated as having more negative impact on parents, but not in their positive impact on parents. When investigating differences between mothers' and fathers' mean ratings, and level of parental agreement in ratings of children with and without ID, no differences were found.

Although previous findings have pointed out diversity of temperament between different diagnostic groups, results of the present study indicate both diversity and certain common characteristics. A more or less accentuated common pattern of high Emotionality, Shyness and Impulsivity together with low Activity and Sociability was found among children with ASD, ID/DD and other diagnoses, with the ASD group being rated as exhibiting the most extreme behaviour. Children with autism have pre-

viously been found to have the highest level of difficult temperament when compared with children with DS, mixed ID/DD and TD children (Kasari & Sigman 1997). However, in the present sample children with ASD, ID/DD and other diagnosis were rated as having similarly high levels of negative impact on their parents.

Results from the present study agreed to some extent with conclusions from Zion & Jenvey's (2006) study of temperament in school-aged children with and without ID. Parents rated their children with ID as less sociable, and teachers rated the same children as higher in emotionality. Certain methodological differences between the present study and the study by Zion and Jenvey may explain differences in results. In addition to studying older children, Zion and Jenvey's ID group contained no children with ASD. Children with ASD may have affected the means of the mixed ID/DD group in the present study as they were for instance shyer and less sociable than other subgroups. Zion & Jenvey (2006) did not assess level of impulsivity – a characteristic which may be of importance when predicting positive and negative impact on parents as indicated by results from the present study.

An important finding was the divide between ID subgroups in terms of Emotionality, adding up to an average similar to that of TD children. Children with DS and CP/MI were rated as low in emotionality, while children with ASD, ID/DD and other diagnoses were rated as high in emotionality. Buss & Plomin's (1984) Emotionality scale, denoting a child's negative emotionality (anger, frustration and distress) has been found to predict later behavioural problems (Schmitz *et al.* 1999). In previous studies children with DS have been rated as low in emotionality compared with children with mixed ID, and the onset of difficult behaviour in children with DS appears to occur later in the developmental trajectory compared with children with mixed ID (Fidler *et al.* 2006). Results from the present study support the notion that young children with DS are experienced as less difficult than children with ID (Kasari & Sigman 1997).

The combination of high Emotionality and Activity has been proposed to represent difficult temperament in TD children (Mathiesen & Sanson 2000; Stoneman 2007). In the present sample we found that negative impact on parents by children

with ID/DD co-occurred with high Emotionality and high Impulsivity even though children in the mixed ID/DD group were generally described as less active. Items within the Activity scale primarily relate to child physical activity, and physical impairments tend to co-occur with several of the diagnoses of the ID/DD group. Consequently, the Activity scale may not provide an accurate picture of experienced intensity of children with ID. Results from the present study imply that the Impulsivity scale may better capture what is experienced as difficult by parents of children with ID. This conclusion is further supported by negative correlation found between child Impulsivity and positive impact on parents in the ID/DD group, but not in the TD group. It is, however, important to note that findings of the present study do not imply a causal relationship between child temperament and negative impact on parents as there may be other factors affecting parents such as the diagnosis itself or demands in the care of the child.

An interesting finding was that although children in the mixed ID/DD group were rated as having less positive impact on parents than TD children, there was no significant difference found between diagnostic subgroups of children with ID/DD. Although children with ASD, ID/DD and other diagnoses were rated as having more negative impact on parents, they were at the same time rated as having equal levels of positive impact on parents as children with DS and CP/MI. This indicates that positive and negative impacts are separate constructs that may coexist, as suggested by Hastings & Taunt (2002), rather than opposite ends on the same scale. Contrary to results of the present study, Baker *et al.* (2002) found no differences in positive impact between children with and without ID, and a negative relationship was found between positive impact and child behaviour problems (Blacher & Baker 2007). The inconsistency in results may be due to a more heterogeneous sample in the present study in comparison with children the studies by Baker *et al.* (2002) and Blacher & Baker (2007).

Results from the measures of agreement between mothers' and fathers' ratings of child temperament appeared somewhat puzzling at first glance. Traditionally, correlations have been used as an index of agreement (Hulbert *et al.* 1986; Achenbach *et al.* 1987), even though comparisons between samples

sometimes turn out to be misleading as indicated by results from the present study. Correlations between parents of children with ID/DD exceeded parents of TD children, which is in agreement with findings from other studies of children with and without ID (Baker *et al.* 2002, 2007). However, measures of absolute and global agreement pointed in the opposite direction with slightly higher levels of agreement between parents of TD children, although differences between groups were not significant. The reason for this discrepancy turned out to be the larger between-subjects variance on temperament scales among children with ID/DD compared with TD children. There was a tendency for children with ID/DD to be distributed along the full range of scales while the range of the TD children was more limited. Consequently, we suggest measures of absolute and global agreement, or methods taking within-subjects variance into account, to be more appropriate estimates of agreement.

#### Methodological considerations

When evaluating the results of the present study, it is important to consider the particular characteristics of the present sample. As we aimed to collect data from parents who had recently found out that their child had an ID/DD, children differed in terms of age as well as in primary diagnosis. The most appropriate way to address this issue would be to control for age in relevant analyses. However, it was not possible to take this approach as age and diagnosis turned out to covary in the ID/DD group. Mathiesen & Tambs (1999) found that Activity and Sociability in TD children decreased with age, while Shyness and Emotionality increased with age. Differences between diagnostic subgroups in the present study were considerably more extensive than Mathiesen and Tambs' findings when considering age. To further understand the relationship between temperament and age in the present sample, TD children were divided into three different age groups corresponding with the ages of the diagnostic subgroups. The only temperamental characteristic that appeared to be age-related was Impulsivity, with young children being rated as more impulsive than older children. However, even if results from the TD group indicated how age may

affect temperament, there are other important factors that may affect temperament in children with ID. For instance, there is little known about how mental and chronological ages are related to temperament. The knowledge about how diagnosis may interact with age is also sporadic, and needs to be further explored. Furthermore, interpretations of data should be considered with some caution as the EASI questionnaire is standardised for children from the age of one, and children with DS in the present sample were younger and temperament in these children has been found to change with age (Fidler *et al.* 2006).

Another aspect of the present sample that needs to be considered was that families were recruited via health services and there was a lack of information about participants who did not participate in the study. However, variation was extensive in the present sample in terms of child's age, diagnosis, family income and area of living. The low response rate may be explained by the multiple pressures experienced by parents of children with ID of parenting a young child and having to adapt to the circumstances of the disability. Another limitation of the present study was that children were diagnosed by medical professionals within the health services, which means that precise information about diagnostic criteria was missing. We would also like to point out that results from subgroup analyses should be considered preliminary, as these groups were small. Subgroup analysis of sociability in particular should be considered with caution as internal consistency has been found to be low (Mathiesen & Tambs 1999).

### Conclusions and clinical implications

The general conclusions are that parents' ratings of children with mixed ID/DD do differ from ratings of TD children in terms of temperament as well as positive and negative impact on parents. Young children with mixed ID/DD tend to be less active and sociable, and shyer and impulsive than TD children. However, temperament in children with DS and CP/MI differed from this pattern. Parents who rate their children with ID/DD as high in emotionality and impulsivity reported more negative impact. In addition to emotionality, the EASI scale measuring impulsivity may be useful in predicting negative

impact on parents. However, further studies are required to investigate the relationship between impulsivity and later behavioural problems in children with ID/DD.

Parents' ratings of child temperament may provide important information regarding how parents are affected by their children with ID/DD, and whether these parents may require extra support. We suggest that there may be different ways of providing support for parents of children with ID/DD who experience their child as having a negative impact. One approach is to provide parents support in programmes or interventions with the aim of creating behavioural changes in the child. The second approach, considering the subjectivity of parents' descriptions of their child, would aim to affect parents' perceptions of their child to shift the focus towards positive characteristics of the child.

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