

## Parents' emotion expression as a predictor of child's social competence: children with or without intellectual disability

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### Abstract

**Background** Parents' expression of positive emotion towards children who are typically developing (TD) is generally associated with better social development. However, the association between parents' negative emotion expression and social development can be positive or negative depending upon a number of factors, including the child's emotion regulation abilities. Given the lower emotion regulation capabilities of children with intellectual disability (ID), we hypothesised that parents' negative emotion expression would be associated with lower social development in children with ID compared to those with TD.

**Methods** Participants were 180 families of children with or without ID enrolled in a longitudinal study. Parents' positive and negative affect were coded live from naturalistic home interactions at child ages 5–8 years, and child's social skills were measured by using mother report at child ages 6–9 years. We examined mothers' and fathers' emotion expression as a time-varying predictor of social skills across ages 5–9 years.

**Results** Mothers, but not fathers, expressed less positive affect and more negative affect with ID group children. Parents' positive affect expression was related to social skills only for TD children, with mothers' positive affect predicting higher social skills. Contrary to expectations, fathers' positive affect predicted lower social skills. Parents' negative affect predicted significantly lower social skills for children with ID than for children with TD.

**Conclusions** Findings support the theory that low to moderate levels of negative expression may be less beneficial or detrimental for children with ID compared to children with TD. Implications for further research and intervention are discussed.

**Keywords** child development, emotion expression, intellectual disability, parenting, social skills

### Introduction

The elementary school years are a time of rapid social development, when children must acquire skills related to regulating their emotion, interacting with peers and responding to increasing social demands. Children with intellectual disability (ID) are particularly at risk for deficits in these areas (Kopp *et al.* 1992; Guralnick *et al.* 2006; Fenning *et al.* 2010; Leffert *et al.* 2010), partially because

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cognitive ability is related to the ability to interpret social situations and develop strategies for responding to them (Smith 1986; Crick & Dodge 1994). Children with ID are also at high risk for behaviour problems (Einfeld & Tonge 1996; Baker *et al.* 2003; Emerson 2003), which may contribute to their social skills deficits.

Parents' emotion expression plays an important role in children's social development by helping children learn about their own and others' emotions (Eisenberg *et al.* 1998). Typically developing (TD) children whose parents are more expressive have more opportunities to learn emotion understanding and emotion regulation skills, and tend to have better general social competence (Eisenberg *et al.* 1998). However, most studies of parenting children with ID focus on parenting behaviour, specifically parental intrusiveness or directiveness (e.g. Herman & Shantz 1983; Landry *et al.* 2000), while few studies of families of children with ID have examined the relationship between parents' emotion expression and their children's social development. Therefore, the aims of this study were to (1) assess differences in parents' emotion expression with their children in ID versus TD groups; (2) examine parents' emotion expression as a predictor of social development across middle childhood; and (3) examine group status (ID, TD) as a moderator of the relationship between parents' emotion expression and child's social skills development over time.

### Emotion expression and social development in typically developing children

Emotion expressiveness includes both verbal and non-verbal behaviour and is usually separated into expression of positive and negative affect (Halberstadt *et al.* 1999). Parents' expression of positive affect with their toddlers, pre-schoolers and school-aged children has been associated with heightened social competence in children, including greater adjustment, emotion understanding, prosocial behaviour and self-esteem (Eisenberg *et al.* 1998; Halberstadt *et al.* 1999). There is also evidence that positive expressiveness is associated with more specific social skills, such as increased assertiveness, empathy, following social rules and effortful control, which may mediate the relationship between parental expressiveness and social competence

(e.g. Denham *et al.* 1991; Zhou *et al.* 2002; McDowell & Parke 2005).

Parental expression of negative emotion is also associated with children's social development, but findings on the direction of the relationship are inconsistent (Eisenberg *et al.* 1998; Halberstadt *et al.* 1999). The association between negative emotion expression and child's social competence may depend on the intensity of the emotion and whether the emotion is directed at the child (Halberstadt *et al.* 1999). Denham & Grout (1992) found that frequent low-intensity, but not high-intensity, maternal negative expression was associated with children's greater social competence. Likewise, Valiente *et al.* (2004) found that for 4- to 8-year-old children, parents with moderate levels of negative expressivity had children with higher levels of sympathy compared with parents with either low or high levels of negative expressivity. Halberstadt *et al.* (1999) hypothesised that moderate levels of negative expressivity may attract the child's attention so they can learn from the experience and practise emotion understanding and regulation. High levels of negative expressivity, however, may increase children's arousal to the point where they are unable to regulate their own emotions to learn about others' distress. This theory has important implications for the study of children with ID, who tend to have lower emotion regulation skills than TD children (e.g. Baker *et al.* 2007), and may thus have a lower threshold for the amount of negative expressivity they can tolerate.

### Emotion expression and social development in children with intellectual disability

There have been few studies of the association between parents' emotion expression and social development of children with ID. Many studies on parenting children with ID focus on the higher levels of parenting stress in these families (e.g. Baker *et al.* 2003), or parents' use of directiveness and intrusiveness (e.g. Herman & Shantz 1983; Landry *et al.* 2000), perhaps reflecting the lower problem-solving abilities or higher rates of behaviour problems in this population (Baker *et al.* 2003). Similarly, parents of children with ID often do not prioritise emotion socialisation over daily living skills despite their awareness that their children are

at risk for social-emotional difficulties (Kopp *et al.* 1992; Baker & Crnic 2009). In the longitudinal sample studied in the present paper, parents' emotion focus during discussions with their children has been found to be positively related to both TD and ID children's social skills (Baker & Crnic 2009) and prosocial problem-solving strategies (Fenning *et al.* 2010). However, parents of children with ID spent less time talking about emotions with their children during such discussions than parents of TD children (Baker & Crnic 2009). Thus, children with ID may have fewer naturalistic opportunities to learn about emotions from their parents, which may exacerbate their risk for social deficits.

#### Mother–father parenting differences

Although fathers are more involved with their children today than they have been in the past (Goldberg *et al.* 2009), fathers are historically understudied, especially in terms of their interactions with their children (Phares *et al.* 2007). Thus, one goal of this study was to expand the literature on how father parenting is related to child's social skills development across time. There is some evidence that mothers and fathers interact differently with their children. In studies of cognitively typical children, fathers engaged in more physical activity with their children than mothers did, while mothers were more verbal and engaged in more teaching behaviours than fathers (Lindsey *et al.* 1997; Goldberg *et al.* 2002). Furthermore, Garner *et al.* (1997) found that mothers tended to report expressing more emotion overall with their children than fathers did, including both sadness and positive emotion. However, the authors noted that fathers may also be less likely to report emotion expression than mothers, indicating a need for observational rather than report-based studies.

Also, fathers' emotion expression may affect child's social development. In one study, fathers who expressed more positive regard with their toddlers had children who gained more cognitive, language and emotion regulation skills by ages 2 and 3 years (Roggman *et al.* 2004). There is clearly a need for systematic, observational study of mother–father emotion expression and possible differential impact

of their emotion expression on social development of both TD and ID children.

#### Parenting and social skills development across childhood

There have been few systematic studies of how parenting is related to social skills development over time, especially in children with ID. Many studies are correlational and look only at one time point (e.g. Grolnick & Ryan 1989; Fagot 1998). This is problematic because parent–child relationships are a transactional process through which a parent responds to a child's characteristics in such a way that may change how the child acts, which, in turn, may change how the parent acts (Warren & Brady 2007). Longitudinal studies that examine the association between parenting and change in social competence over time can help address the problem of causality.

Although few longitudinal studies have been conducted examining parenting behaviour and social development in children with ID, parenting stress has been found to negatively influence changes in social skills of children with ID over time (Neece & Baker 2008). Landry *et al.* (2001) were some of the first investigators to address this question, although still within early childhood. They measured parental responsiveness at an early age (composite from 6, 12 and 24 months) and a later age (composite of 42 and 54 months) in preterm and full-term children. Parents who were consistently responsive at the earlier and later times had children with better cognitive growth regardless of preterm or full-term status. Full-term children had the same rates of social development regardless of whether their mothers had early or consistent responsiveness. However, preterm children with consistently responsive mothers had better rates of social development than preterm children with early-responsive or inconsistent (low–moderate) responsiveness. Although Landry *et al.* did not specifically examine parental emotion expression, these results suggest that consistent parenting across childhood may be even more important for children with ID because they have lower mental ages than TD children of the same age, who are functioning cognitively like younger children for whom certain types of parenting are most important. While the Landry *et al.*

study is innovative, it only included children up to age 4.5 years, so more research is necessary on whether parenting continues to affect social development in older children and those with ID.

### The current study

The current study examined the relationship between parental emotion expression and social skills development across elementary school (ages 5–9 years) in children with and without ID. We investigated the following questions: (1) Do mothers and fathers express different levels of positive and negative emotions with their children? (2) Do parents express different levels of positive and negative affect with children with ID than with TD children? We hypothesised that parents would express lower levels of positive and higher levels of negative emotions with children with ID. (3) Is parental expression of positive affect predictive of social skills for ID and/or TD children across elementary school? We hypothesised that positive affect would be predictive of gains in social skills for both groups of children. (4) Is the expression of negative affect predictive of social skills for ID and/or TD children across elementary school? We hypothesised that delay status would moderate the relationship between parents' negative expression and child's social skills such that negative affect would only predict positive changes in social skills for TD children.

## Methods

### Participants

Participants were 180 families in the Collaborative Family Study, a longitudinal study of young children with and without developmental delays, with samples drawn from southern California (78%) and central Pennsylvania (22%). This study was based at three universities: Penn State University, University of California, Los Angeles and University of California, Riverside. The Institutional Review Boards of the three universities approved procedures; informed consent was obtained from participating parents and assent from the children. Families were assessed annually from child ages 3 through 9 years.

Families were recruited into the study at child age 3 years. Families of children with developmental delays came primarily from agencies that provide and purchase diagnostic and intervention services for persons with intellectual and developmental disabilities. In California, practically, all families with young children with ID register for services with one of a network of Regional Centers. Children with autism were excluded from the study. Families of children with typical development (TD) were recruited primarily through local pre-schools and day care programmes. Selection criteria were that the child scored in the range of normal cognitive development and had not been born prematurely or had any developmental disability. In recruiting participants, school and agency personnel mailed brochures describing the study to families who met the selection criteria and interested parents contacted the research centre. All children were assessed in their homes with the Bayley Scales of Infant Development at age 3 years to confirm their developmental status.

The present study uses classifications at child age 5 years, when children were reassessed with the Stanford–Binet Intelligence Scale – 4th Edition (Thorndike *et al.* 1986) and the Vineland Adaptive Behavior Scales (VABS; Sparrow *et al.* 1984). Following criteria in the Diagnostic and Statistical Manual of Mental Disorder – 4th Edition (DSM-IV; APA 1994), children were classified as intellectually disabled ( $IQ \leq 70$  and VABS  $T$ -score  $< 85$ ,  $n = 49$ ), borderline intellectually disabled ( $IQ 71–84$  and VABS  $< 85$ ,  $n = 20$ ) or typically developing ( $IQ > 85$ ,  $n = 111$ ). For analyses, the children in the ID and borderline ID groups were combined and referred to as ID. Children from the larger longitudinal study were included in the present sample of 180 if they had at least two time points of parenting and social skills data (with both measures at the same time points) between ages 5–9 years.

Table 1 shows demographics (means or percentages) for the ID and TD groups. For the whole sample, 57% were male and the majority of children were white, non-Hispanic (58.3%) with the others Hispanic (16.7%), African American (8.3%), Asian (1.7%), or designated as more than one race (15%). Mothers and fathers were, on average, in their mid to late 30s; about half of the sample had at least 4 years of college education and 58% of families had

Table 1 Descriptive statistics

	TD % or mean (SD)	ID % or mean (SD)	$\chi^2$ (d.f.) or t (d.f.)	F (Levine's test for equality of variances)
Child gender (% male)	55.9	59.4	$\chi^2 = 0.22$ (1)	
Child race (% minority)	38.7	46.4	$\chi^2 = 1.02$ (1)	
Family income (% <\$50 000)	36.0	50.7	$\chi^2 = 3.78^\dagger$ (1)	
Stanford-Binet IQ	104.3 (11.8)	60.0 (14.2)	22.62*** (178)	3.03 <sup>†</sup>
Mother grade completed	15.7 (2.3)	14.4 (2.0)	3.85*** (178)	1.89
Father grade completed	15.7 (3.0)	14.6 (2.7)	2.23* (156)	0.38
Mother positive affect	2.26 (0.72)	2.01 (0.76)	2.19* (178)	0.21
Father positive affect	2.11 (0.86)	1.93 (0.83)	1.21 (144)	1.08
Mother negative affect	1.45 (0.61)	1.77 (0.80)	-2.86** (116)	11.48**
Father negative affect	1.24 (0.47)	1.35 (0.43)	-1.38 (144)	0.90
SSRS – cooperation <sup>‡</sup>	11.91 (3.27)	9.55 (3.56)	4.51*** (175)	1.45
SSRS – assertion <sup>‡</sup>	15.99 (2.75)	13.46 (3.88)	4.71*** (111)	9.99**
SSRS – responsibility <sup>‡</sup>	12.49 (3.21)	8.67 (3.83)	7.16*** (175)	2.49
SSRS – self-control <sup>‡</sup>	13.01 (3.21)	9.83 (3.69)	6.07*** (175)	1.02

Scores reported from child age 5 years except where otherwise noted. Child and mother variables had numbers of 111 TD and 69 ID except where otherwise noted. Father variables had numbers of 95 and 51 respectively.

<sup>†</sup>  $P < 0.10$ , \*  $P < 0.05$ , \*\*  $P < 0.01$ , \*\*\*  $P < 0.001$ .

<sup>‡</sup> SSRS scores reported from child age 6 years, the first year they were collected. Three TD children did not have scores at age 6, so  $n = 108$  TD and 69 ID for these analyses.

TD, typical development; ID, intellectual disability; SSRS, Social Skills Rating System.

annual incomes greater than \$50 000 in 2001–2003 dollars. As shown in Table 1, TD and ID group mothers and fathers differed significantly on education, with TD group parents having, on average, about 1 year more of schooling.

## Procedures

Measures of the child's intellectual level were obtained at the third annual assessment when the children were 5 years of age. Children completed the Stanford-Binet at the child study centre, while their mothers completed the Vineland. The remaining data used in this study came from observations that were conducted in the family home (child ages 5–8 years), and from mothers' report of child's social skills obtained as part of a packet of measures completed annually (child ages 6–9 years). Parenting data were coded for ages 5 through 8, at 1-year intervals. Social skills data were collected for ages 6 through 9, also at 1-year intervals.

## Measures

### Stanford-Binet Intelligence Scale – 4th Edition

The Stanford-Binet (Thorndike *et al.* 1986) was administered at age 5 to assign children to intellectual status groups. This is a widely used instrument with high internal consistency (Glutting 1989) and good evidence of validity (Thorndike *et al.* 1986). It is particularly well-suited to the evaluation of children with delays because the examiner adapts starting points according to the child's developmental level. The eight subtests most appropriate for 5-year-olds were administered (Vocabulary, Comprehension, Absurdities, Pattern Analysis, Copying, Quantitative, Bead Memory and Memory for Sentences). The Composite IQ score was used for the present study.

### Vineland Adaptive Behavior Scales

The VABS (Sparrow *et al.* 1984) were used to assess adaptive behaviour at age 5. This is a



semi-structured interview assessing the adaptive behaviour of individuals with or without disabilities. Mothers were informants and reported on behaviours that their children usually do. Three sub-scales (*communication, daily living skills, socialisation*) were combined to form an Adaptive Behavior Composite Standard score.

#### *Social Skills Rating System*

The Social Skills Rating System (SSRS; Gresham & Elliott 1990) was used to assess child's social skills annually from ages 6–9 years. Mothers completed the Parent Form of the elementary-level version of the SSRS (kindergarten through sixth grade). The SSRS is a widely used questionnaire with adequate reliability and validity (Gresham & Elliott 1990). Parents rate each question as 0 (never), 1 (sometimes) or 2 (very often). We used the four SSRS sub-scales: *cooperation* (e.g. doing household chores, getting along with others), *assertion* (e.g. making friends, asking for information), *responsibility* (e.g. answering phone, asking permission, following social rules) and *self-control* (e.g. controlling anger, responding appropriately to others). Each scale contains 10 items; two items are scored as part of two different scales. Gresham & Elliott (1990) report high test–retest reliability over 4 weeks ( $r = 0.84$ ) and sub-scale internal consistency ranges from  $r = 0.65$  (responsibility) to  $r = 0.80$  (self-control).

#### *Parent–Child Interaction Rating Scale* (Belsky et al. 1995)

Parents' emotion expression was coded from naturalistic home observations of families, conducted annually from child ages 5–8 years. Families were observed in the evening, for a 60-min period at age 5 years, and a 30-min period each year at ages 6–8 years. Coders observed for 10 min, followed by a 5-min scoring period. Ratings were averaged across the four (age 5 years) or two (ages 6–8 years) 10-min observation periods.

A number of parent, child and dyadic behaviours were observed. Each of the behaviours was rated on a 5-point Likert scale (1 = not at all characteristic, 5 = highly or predominantly characteristic) that considered both the frequency and intensity of the expressed affect or behaviour. Two of the dimensions, positive affect and negative affect, were exam-

ined for the current study. *Positive affect* included the verbal and behavioural expression of positive regard or affect, warmth and affection. *Negative affect* referred to the expression of negative emotion, disapproval and hostility through verbal means (e.g. harsh tone of voice) or non-verbal behaviour (e.g. strained expression, look of disgust).

Prior to collecting observational data in the home, coders were trained on videotapes of home observations and attended live home observations with an experienced coder until reliability was established. Reliability was defined as a criterion of over 70% exact agreement with the primary coder and 95% agreement within one scale point. After obtaining reliability, individual observers conducted home observations. To maintain reliability within and across project sites, we designated a primary coder at each site, and determined reliability regularly through videotaped and live home observations. The kappa coefficient for within-site reliability was 0.61 and 0.59 at the California and Pennsylvania sites respectively, and kappa for across-site reliability was 0.64 (see also Crnic et al. 2005). Kappa coefficients represent a conservative reliability index, and these levels are considered acceptable (Fleiss et al. 1969).

#### *Data analytic plan*

The main hypotheses were tested by conducting multilevel growth model analyses using hierarchical linear modeling (HLM; Raudenbush & Bryk 2002). HLM analyses can accommodate missing data and unequal numbers of observations between participants because they model the individual growth trajectories of each participant. Therefore, we included all participants who had at least two time points of data. Sixteen separate growth models were created for fathers' and mothers' negative and positive affect as predictors, and for each of the four dependent variables (cooperation, assertion, responsibility and self-control).

Each model consisted of two levels of analysis. Level 1 included predictors of social skills, including the social skills intercept at Time 1 and the social skills slope over time, as well as the time-varying parental emotion expression. The time-varying parental predictors were lagged 1 year behind the social skills data, so that each time point of parental

data was used to predict the subsequent year of social skills [see Singer & Willett (2003) for a full discussion of specifying growth models and time-varying predictors]. Level 2 included the time-invariant predictors [cognitive status (ID or TD) and education as a covariate].

Continuous covariates were centred around the grand mean, so that intercept coefficients could be interpreted as pertaining to the 'average' participant (e.g. participant with average education). Status was coded such that the TD group = 0 and the ID group = 1 so that intercept coefficients pertained to the significance for the TD group, and the intercept by status interactions tested whether there was a significant difference between groups. When analyses showed a significant difference between groups, follow-up analyses were conducted with status recoded as ID = 0 and TD = 1 to test for a significant relationship between parenting and social skills in the ID group.

## Results

### Descriptive statistics

Descriptive statistics for the main study variables are displayed in Table 1. At child age 5 years, mothers of TD children expressed more positive affect than fathers of TD children ( $t = 2.18$ ,  $P = 0.032$ ), but there was no significant difference between positive affect expressed by mothers and fathers of children with ID ( $t = 1.05$ ,  $P = 0.30$ ). Mothers of both children with TD ( $t = 2.18$ ,  $P = 0.032$ ) and children with ID ( $t = 2.68$ ,  $P = 0.001$ ) expressed more negative affect with their children than fathers did. Mothers of ID group children expressed significantly less positive affect and more negative affect while interacting with their children than mothers of TD group children. There was also significantly more variability in expression of negative affect in the ID group. There were no differences in fathers' expressed affect between the two groups.

At child age 5 years, most parents displayed moderate levels of positive affect and low levels of negative affect. Few mothers (8.3%) displayed no positive affect (average score of 1); 74.5% displayed low to moderate levels of positive affect (average score of 1.25–2.75), and 17.2% displayed high levels

of positive affect (average score of 3–4.25). The distribution of fathers' positive affect was similar: 11.7% no positive affect, 67.1% low to moderate, and 21.2% high. Most parents showed low levels of negative affect, with 31.1% of mothers and 46.7% of fathers showing no negative affect, 61.1% of mothers and 52.6% of fathers moderate, and 7.8% of mothers and only 0.6% of fathers showing high negative affect.

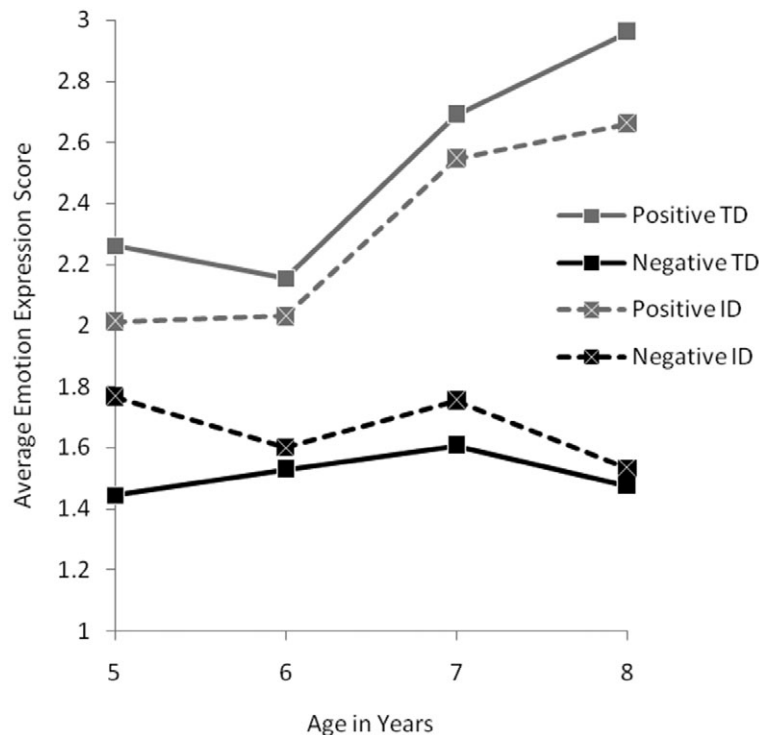
As shown in Figs 1 and 2, mothers' and fathers' expression of positive affect increased from ages 5–8 years in both groups of children. However, negative affect was relatively stable over time for both groups.

### Correlations among variables

Parents' positive and negative affect codes showed low (although significant) inverse correlations at age 5 years (mothers:  $r = -0.24$ ,  $P < 0.01$ ; fathers:  $r = -0.17$ ,  $P < 0.05$ ), supporting the theory that these two constructs are best studied separately. Mothers' education was significantly positively correlated with SSRS responsibility ( $r = 0.20$ ,  $P < 0.01$ ) and self-control ( $r = 0.18$ ,  $P < 0.05$ ), and with positive affect for mothers ( $r = 0.18$ ,  $P < 0.05$ ) and fathers ( $r = 0.19$ ,  $P < 0.05$ ). Fathers' education was significantly positively correlated with positive affect for mothers ( $r = 0.23$ ,  $P < 0.01$ ) and fathers ( $r = 0.31$ ,  $P < 0.001$ ). Thus, mothers' education was covaried in all mother analyses, and fathers' education was covaried in all father analyses.

### Growth models for child's social competence variable

Growth models were used to examine the linear slope of child's social skills for each status group. Results of these growth models are displayed in Table 2. The variable used to represent time ranged from 0–3 because there were four yearly time points of social skills, from child age 6 through child age 9 years. As in regression analyses, because time 1 (age 6 years) was set to 0, the intercept (initial time point of each trajectory) of each model indicated the mean score at age 6 years for the social skills sub-scale used in the model. In each model (each social skills sub-scale), the ID group had lower initial social scores than the TD group (status), and



**Figure 1** Mothers' affect over time. TD, typical development; ID, intellectual disability.

there was significant individual variability in the initial scores of each social skills sub-scale (intercept variance).

The responsibility model had a significant, positive slope for both groups, and the cooperation and self-control models had significant, positive slopes for the ID group only. All models had significant slope variance components, indicating that there was significant variability in slopes among children (Figs 3,4).

#### Time-varying predictor growth models

Time-varying predictor growth models were used to examine parents' emotion expression as time-varying predictors of child's social skills across time. Maternal education was the only covariate entered.

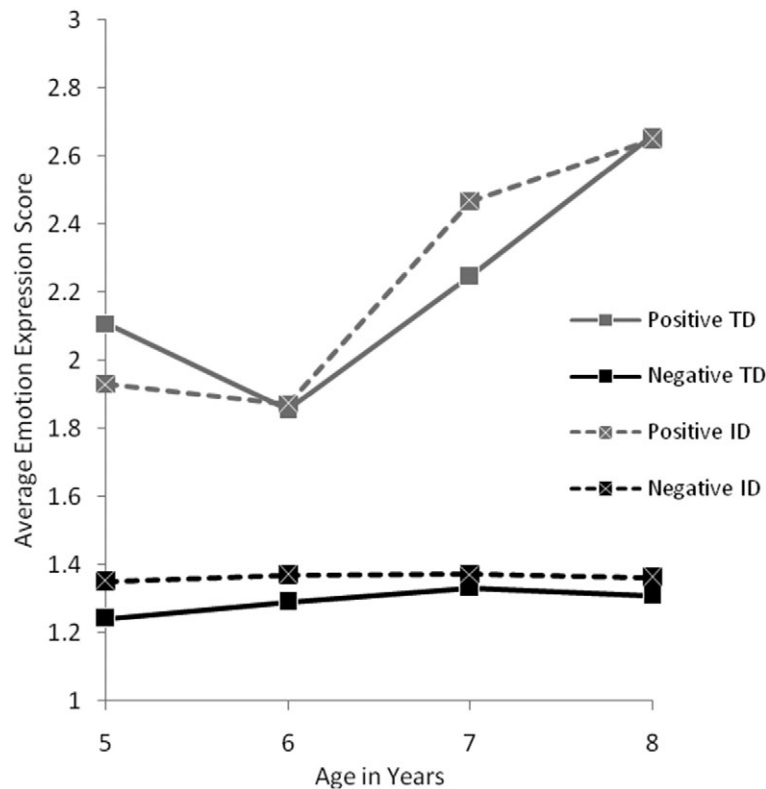
##### *Positive affect*

Initial analyses showed that the time-varying emotion expression variables did not have significant variance components (i.e. did not randomly vary across individuals) after accounting for variance in child's social skills because of initial social

skills and change in time, so these variables were entered as fixed (i.e. not randomly varying) variables. Table 3 shows results of mother models and Table 4 shows results of father models. Maternal positive affect predicted social skills over time only in the model predicting to responsibility. There was a significant interaction with status such that the ID group had a significantly lower association between maternal positive affect and responsibility than the TD group. Follow-up analyses showed that the relationship between positive affect and responsibility was not significant for the ID group [coefficient =  $-0.30$ ,  $SE = 0.22$ ,  $t(639) = -1.39$ ,  $P = 0.16$ ]. Thus, maternal positive affect predicted increased responsibility for the TD group but not for the ID group.

Paternal positive affect significantly predicted lower cooperation for the TD group. Follow-up analyses showed that this relationship was not significant for the ID group [coefficient =  $0.05$ ,  $SE = 0.24$ ,  $t(514) = 0.19$ ,  $P = 0.85$ ]. There were no other significant associations between the time-varying positive-affect variables and child's social skills. In sum, for TD children only, maternal





**Figure 2** Fathers' affect over time. TD, typical development; ID, intellectual disability.

**Table 2** Results of unconditional growth models for each of the social skills scales

Variable	Cooperation	Assertion	Responsibility	Self-control
Intercept parameter ( $\gamma_{00}$ )	11.98***	15.95***	12.48***	13.13***
By status	-2.32***	-2.75***	-3.82***	-3.35***
Intercept variance component ( $\delta_0$ )	7.78***	8.95***	9.41***	9.09***
Slope parameter ( $\gamma_{01}$ )	-0.01	0.03	0.54***	0.13
By status	0.41*	0.22	0.09	0.45**
Slope variance component ( $\delta_1$ )	0.39***	0.31***	0.29***	0.50***

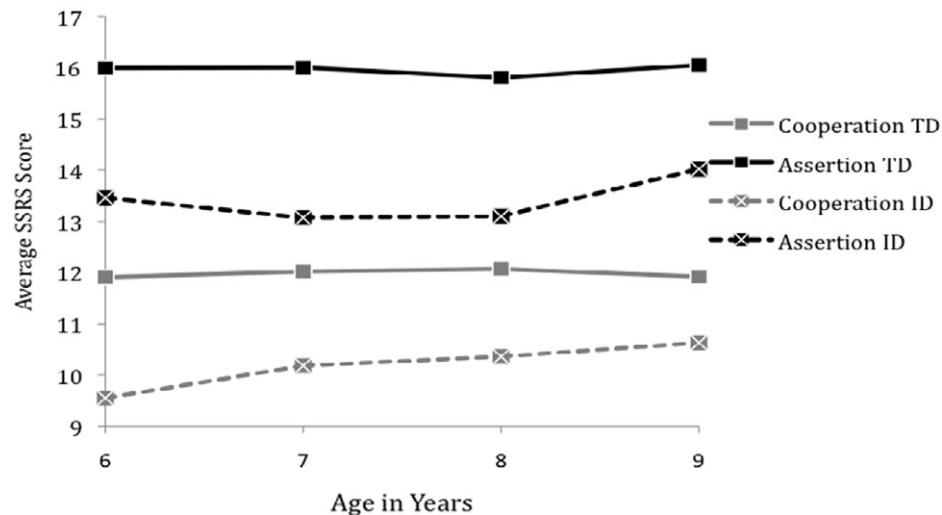
\*  $P < 0.05$ , \*\*  $P < 0.01$ , \*\*\*  $P < 0.001$ .

positive affect predicted higher responsibility over time and paternal positive affect predicted lower cooperation over time. Parents' positive affect was not predictive of social skills for children with ID.

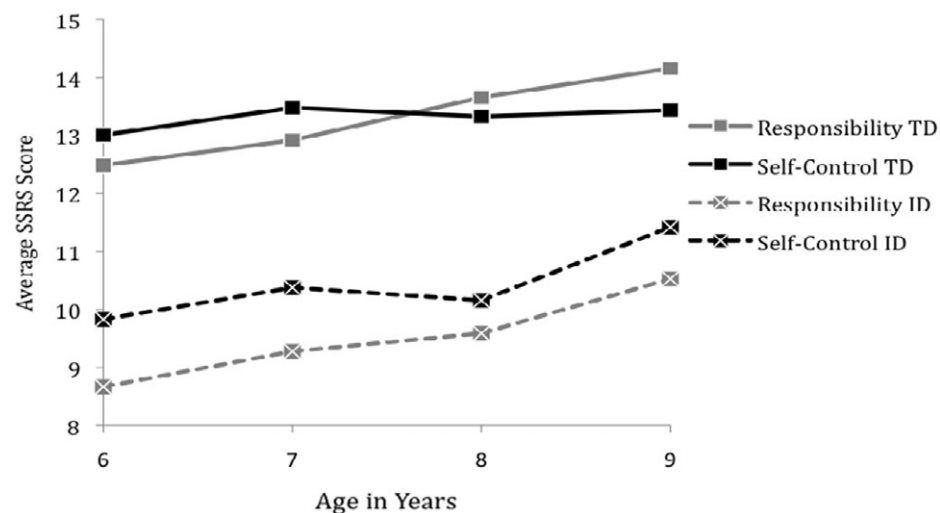
#### Negative affect

Maternal negative affect had a marginally significant positive relationship with responsibility but did not

predict any of the other social skills scales over time for the TD group. There were significant interactions between status and maternal negative affect in the responsibility and self-control models indicating that maternal negative affect predicted responsibility and self-control more negatively for the ID group than for the TD group. Follow-up analyses showed that maternal negative affect marginally negatively predicted responsibility for the ID group



**Figure 3** Cooperation and assertion affect over time. TD, typical development; ID, intellectual disability.



**Figure 4** Responsibility and self-control over time. TD, typical development; ID, intellectual disability.

[coefficient =  $-0.45$ ,  $SE = 0.25$ ,  $t(642) = -1.78$ ,  $P = 0.07$ ] and significantly negatively predicted self-control for the ID group [coefficient =  $-0.61$ ,  $SE = 0.21$ ,  $t(639) = -2.93$ ,  $P = 0.004$ ]. Thus, maternal negative affect marginally predicted higher responsibility over time in the TD group but predicted lower responsibility and self-control for the ID group. There were no significant interactions between maternal education and negative affect.

Paternal negative affect significantly positively predicted assertion, responsibility and self-control

over time in the TD group. Follow-up analyses showed that these relationships were not significant in the ID group [assertion coefficient =  $0.59$ ,  $SE = 0.41$ ,  $t(513) = 1.44$ ,  $P = 0.15$ ; responsibility coefficient =  $0.10$ ,  $SE = 0.36$ ,  $t(513) = 0.27$ ,  $P = 0.79$ ; self-control coefficient =  $0.04$ ,  $SE = 0.41$ ,  $t(513) = 0.09$ ,  $P = 0.93$ ]. There was a significant interaction between status and negative affect indicating that negative affect more negatively predicted cooperation for the ID group than for the TD group. Follow-up analyses showed that paternal

**Table 3** Results of conditional growth models with positive affect as a time-varying covariate of social skills

Model	Variable	Cooperation	Assertion	Responsibility	Self-control
Mother positive affect	Intercept	12.06*** (0.42)	15.93*** (0.43)	11.92*** (0.41)	12.72*** (0.47)
	By status <sup>†</sup>	-2.48** (0.74)	-2.52** (0.82)	-2.66** (0.76)	-2.62** (0.89)
	By education	-0.12 (0.14)	0.02 (0.16)	—	0.33 <sup>†</sup> (0.18)
	Slope	0.02 (0.10)	0.004 (0.09)	0.47*** (0.09)	0.11 (0.11)
	By status <sup>†</sup>	0.27 (0.18)	0.12 (0.17)	0.22 (0.17)	0.39* (0.18)
	By education	-0.10* (0.05)	-0.09* (0.04)	—	-0.08 <sup>†</sup> (0.04)
	Mom positive affect	-0.04 (0.14)	-0.03 (0.13)	0.26* (0.11)	0.17 (0.16)
	By status <sup>†</sup>	0.08 (0.27)	-0.03 (0.27)	-0.56* (0.24)	-0.26 (0.31)
	By education	0.05 (0.05)	0.06 (0.05)	—	-0.10 (0.07)
	Father positive affect	12.56*** (0.40)	16.35*** (0.40)	12.35*** (0.45)	13.67*** (0.45)
Father positive affect	By status <sup>†</sup>	-3.21*** (0.69)	-3.20*** (0.79)	-4.24*** (0.77)	-3.84*** (0.77)
	By education	—	0.22* (0.11)	—	—
	Slope	-0.01 (0.12)	0.03 (0.09)	0.55*** (0.10)	0.16 (0.12)
	By status <sup>†</sup>	0.48** (0.18)	0.14 (0.20)	-0.02 (0.19)	0.41* (0.19)
	By education	—	-0.00 (0.03)	—	—
	Dad positive affect	-0.29* (0.13)	-0.23 (0.14)	0.07 (0.15)	-0.22 (0.14)
	By status <sup>†</sup>	0.33 (0.27)	0.15 (0.28)	0.07 (0.28)	0.13 (0.25)
	By education	—	-0.06 (0.04)	—	—

Coefficients are unstandardised and standard errors are in parentheses.

<sup>†</sup>  $P < 0.10$ , \*  $P < 0.05$ , \*\*  $P < 0.01$ , \*\*\*  $P < 0.001$ .

<sup>‡</sup> Status was coded as TD = 0, ID = 1; 'by status' coefficients denote ID coefficient - TD coefficient.

TD, typical development; ID, intellectual disability.

**Table 4** Results of conditional growth models with negative affect as a time-varying covariate of social skills

	Model	Cooperation	Assertion	Responsibility	Self-control
Mother negative affect	Intercept	12.19*** (0.43)	15.38*** (0.37)	11.95*** (0.43)	12.85*** (0.41)
	By status <sup>‡</sup>	-2.23** (0.66)	-2.00* (0.79)	-2.49** (0.79)	-1.88* (0.73)
	By education	-0.11 (0.14)	0.04 (0.15)	—	0.10 (0.14)
	Slope	0.02 (0.09)	-0.01 (0.09)	0.53*** (0.09)	0.15 (0.11)
	By status <sup>‡</sup>	0.28 (0.16)	0.12 (0.17)	0.07 (0.16)	0.29 <sup>†</sup> (0.17)
	By education	-0.09* (0.04)	-0.07* (0.03)	—	-0.10* (0.04)
	Mom negative affect	-0.13 (0.22)	0.34 <sup>†</sup> (0.19)	0.35 <sup>†</sup> (0.20)	0.15 (0.21)
	By status <sup>‡</sup>	-0.03 (0.28)	-0.40 (0.32)	-0.80* (0.33)	-0.76* (0.31)
	By education	0.05 (0.06)	0.06 (0.07)	—	0.02 (0.07)
Father negative affect	Intercept	11.58*** (0.46)	15.26*** (0.39)	11.65*** (0.47)	12.30*** (0.49)
	By status <sup>‡</sup>	-1.34 <sup>†</sup> (0.76)	-3.16*** (0.83)	-3.41*** (0.86)	-2.69** (0.85)
	Slope	-0.06 (0.11)	-0.02 (0.10)	0.56*** (0.10)	0.12 (0.11)
	By status <sup>‡</sup>	0.55** (0.17)	0.17 (0.19)	-0.00 (0.18)	0.43* (0.18)
	Dad negative affect	0.34 (0.28)	0.52* (0.21)	0.68** (0.25)	0.75* (0.30)
	By status <sup>‡</sup>	-0.93* (0.43)	0.07 (0.46)	-0.58 (0.44)	-0.72 (0.51)

Coefficients are unstandardised and standard errors are in parentheses.

<sup>†</sup>  $P < 0.10$ , \*  $P < 0.05$ , \*\*  $P < 0.01$ , \*\*\*  $P < 0.001$ .

<sup>‡</sup> Status was coded as TD = 0, ID = 1; 'by status' coefficients denote ID coefficient - TD coefficient.

TD, typical development; ID, intellectual disability.

negative affect marginally negatively predicted cooperation [coefficient =  $-0.60$ ,  $SE = 0.33$ ,  $t(513) = -1.81$ ,  $P = 0.07$ ].

In sum, maternal negative affect predicted marginally higher responsibility for the TD group only and lower responsibility and self-control over time for the ID group only. Paternal negative affect predicted higher assertion, responsibility and self-control over time for the TD group only, and predicted marginally lower cooperation over time for the ID group only.

## Discussion

The focus of this study was on the relationship between parents' emotion expression and social skills in children with TD or ID. Our first and second questions asked whether mothers and fathers expressed different levels of positive and negative emotion with children in the ID group versus the TD group. At child age 5 years, compared with fathers, mothers expressed higher levels of negative affect with both groups, but higher levels of positive affect only with the TD group. Mothers and fathers expressed similar levels of positive affect with children in the ID group. Similarly, mothers of children with ID expressed lower levels of positive affect and higher levels of negative affect than did mothers of children with TD. These results are consistent with previous findings that, overall, mothers tend to express more emotion with their children than fathers do (Garner *et al.* 1997). However, this does not appear to hold true for children with ID, with whom mothers were found to express less positive emotion (and thus similar levels to fathers). This positive affect difference suggests that parents are not 'babying' or coddling children with ID by expressing higher positive affect, the way one might with a younger child or infant. The negative affect difference is consistent with previous findings that mothers of children with ID tend to be more intrusive and restrictive, behaviours often associated with negativity (e.g. Herman & Shantz 1983; Landry *et al.* 2000). Furthermore, their higher levels of negative affect and lower levels of positive affect could be a response to the demands of parenting a child with higher behaviour problems and lower social skills and adaptive behaviour (Kopp *et al.* 1992; Baker *et al.* 2003; Baker & Crnic 2009) as well as a

response to the higher levels of stress experienced by parents of children with ID (Baker *et al.* 2003).

We examined social skills across middle childhood. Children with ID were found to have significantly lower social skills than children with TD in all four of the areas examined (cooperation, assertion, responsibility and self-control). This is consistent with previous research using a variety of social skills measures (Kopp *et al.* 1992; Guralnick *et al.* 2006; Fenning *et al.* 2010). Surprisingly, on average, the TD children only showed significant growth in responsibility from ages 6–9 years, while the children with ID showed significant growth in cooperation, responsibility and self-control, although there was significant variability in growth over time within both groups. While neither group had reached a ceiling on the social skills measure at age 6, it is possible that many of the skills the children had not mastered by age 6 or 7 years were also unlikely to have been mastered by age 9 years (e.g. cleaning room without being reminded; congratulating others). It is also possible that because parents had to choose among 'never', 'sometimes' or 'very often' for each behaviour, they might continue to choose 'sometimes' even if the child had increased the frequency of a particular behaviour over the past year.

Our third question asked whether positive affect was predictive of social skills. Positive affect was found to be related to increased social skills (responsibility) only for TD children. This finding is consistent with previous research involving TD children showing a relationship between parents' positive affect and greater social competence (e.g. Eisenberg *et al.* 1998; Halberstadt *et al.* 1999). However, positive affect was not related to increases in any social skills domain for children with ID. It is possible that children with ID are simply less aware of the meaning of subtle emotion expressed by their parents, an idea supported by findings that children with ID are less negatively affected by their parents' marital discord than those with TD (Wieland & Baker 2010). Children with ID may need larger, more obvious expressions of positive affect in order to understand and benefit from it.

An unexpected finding was that fathers' positive affect expression predicted *lower* levels of cooperation for children with TD. This could be a result of the types of cooperation skills measured, many of which were related to household chores. Perhaps,

fathers with lower levels of positive affect are less likely to indulge their children and more likely to encourage them to complete chores. A limitation in this observation procedure is that while we can assess parents' positive and negative affect overall, we cannot determine contingent relationships between child's behaviours and parents' affective response. If, for example, fathers tend to provide non-contingent positive affect, we might not expect an increase in behaviours such as 'chores'. Future work might examine (1) the appropriateness of parents' affect to a particular context as this may provide a better index of the relationship and (2) how the level of appropriateness relates to child's social skills growth.

Our fourth question asked whether negative affect expression was predictive of social skills development. For children with TD, fathers' negative affect predicted increases in children's social skills (assertion, responsibility, self-control) and mothers' negative affect showed a trend in that direction for responsibility. As negative affect was generally low to moderate in the participants of this study, this finding is consistent with previous research showing that low to moderate levels of negative affect expression may attract a child's attention so that they may use the experience to learn about emotion (Halberstadt *et al.* 1999).

We hypothesised that negative affect might have a less beneficial effect on children with ID than on TD children, and findings generally supported this hypothesis. Mothers' negative affect predicted significantly lower levels of responsibility and self-control for ID than for TD children, and similarly fathers' negative affect predicted lower levels of cooperation for ID than for TD children. Thus, parents' negative emotion expression may have a more detrimental effect on children with ID than on those with TD. This is consistent with previous findings that children with lower levels of emotion regulation ability are less able to benefit from their parents' expression of negative emotion (Michalik *et al.* 2007).

This study had a number of methodological strengths, including modelling both mothers' and fathers' emotion expression as a time-varying predictor of children's social development across elementary school. The multilevel analysis included repeated measures of both social skills and parent-

ing across four time points. Furthermore, by lagging parenting 1 year behind social skills, we were able to examine each time point of parenting as a predictor of the subsequent year of social skills. This type of longitudinal research is important, as it can contribute to our understanding of (although not proven) causal factors implicated in child's social development.

Despite these strengths, the study had certain limitations. One concerns the measurement of social skills. The parent report measure used may not have been a sensitive measure of change over time, as parents could have lumped multiple levels of a behaviour into the middle, 'sometimes' score. Further, although parents' emotion expression was observed and coded live, children's social skills were measured only through parents' report. While it can be advantageous to predict across types of measurement in order to minimise variance due to shared measurement, future studies might benefit from examining observed measures of social competence.

A possible limitation in interpreting the findings is that we ran a large number of growth models (16), so some findings could have occurred by chance. These relationships of parents' emotion expression and child's social competence require further study. Additionally, studying mediators of the relationship could help to explain the differences found between mothers' and fathers' emotion expression. It is possible that mothers and fathers express positive and negative affect differently; for example, negative mothers might be more intrusive while negative fathers might be more detached. This difference is consistent with findings that mothers respond to their children's social behaviours with instruction almost twice as much as fathers do (Fagot 1998).

### Implications for intervention

Interventions for parents of children with intellectual or developmental delays often emphasise parents' behaviour management and child's skill acquisition (e.g. Baker 1996). However, findings from recent studies of children with ID suggest that parents can contribute to their children's development in other important ways, such as scaffolding child's learning (i.e. providing support and assistance to help a child reach a goal; Baker *et al.* 2007), or discussing emotional experiences with



their children (Baker & Crnic 2009; Fenning *et al.* 2010). Results from the present study suggest that parents' expression of emotion in naturalistic interactions may be another parenting skill worth addressing in interventions for parents of children with ID, especially because the optimal amount and type of emotion expressed may be different for children with ID than for those with TD.

Furthermore, parents' prioritisation of daily living skills (Baker & Crnic 2009) may contribute to parents' increased negative affect with children with ID if this emphasis means they are spending more time in direction and limit-setting. Thus, it may not be negative affect *per se* that is affecting the social development of children with ID; rather, negative affect may be a marker of skills parents are focusing on. Indeed, parents of children with ID who prioritise daily living skills over emotion socialisation tend to have children with lower social skills (Baker & Crnic 2009). Thus, parents might benefit from learning how to encourage daily living skills without expressing negative emotion, as well as how to incorporate emotion-learning opportunities into the day in the most effective way for their children. For example, because daily living skills are more difficult for children with ID, these children may not benefit from parents' negative emotion expression while trying to carry them out, but might benefit from it at other times when they are less overwhelmed. Clearly, more research is necessary on the mechanisms through which parents' emotion expression affects children's social development, but these findings support other recent studies suggesting that interventions for children with ID might be strengthened by increased focus on parental socialisation of emotion.

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