

Parenting Stress in Mothers and Fathers of Toddlers with Autism Spectrum Disorders: Associations with Child Characteristics

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Abstract Elevated parenting stress is observed among mothers of older children with autism spectrum disorders (ASD), but little is known about parents of young newly-diagnosed children. Associations between child behavior and parenting stress were examined in mothers and fathers of 54 toddlers with ASD (mean age = 26.9 months). Parents reported elevated parenting stress. Deficits/delays in children's social relatedness were associated with overall parenting stress, parent-child relationship problems, and distress for mothers and fathers. Regulatory problems were associated with maternal stress, whereas externalizing behaviors were associated with paternal stress. Cognitive functioning, communication deficits, and atypical behaviors were not uniquely associated with parenting stress. Clinical assessment of parental stress, acknowledging differences in parenting experiences for mothers and fathers of young children with ASD, is needed.

Keywords Toddlers · Parenting stress · Autism spectrum disorders · Mothers and fathers

Introduction

The challenges involved in raising a child with autism spectrum disorders (ASD) have been well-documented over the last several decades. Parents of children with ASD typically report higher levels of parenting stress and higher affective symptoms when compared to parents of typically developing children and parents of children with other disabilities (e.g., Bristol and Schopler 1984; Dumas et al. 1991; Holroyd and McArthur 1976). Parenting stress has been one of the most frequently researched aspects of family life among families of children with ASD. As increasing numbers of very young children are receiving a diagnosis of ASD (Cox et al. 1999), and as children are being diagnosed at younger ages (Charman and Baird 2002), continued study of factors that impact parenting stress is needed in order to help families adapt to the challenges of caring for a young child with ASD. Thus, the aim of this paper is to examine factors that are associated with parenting stress among both mothers and fathers of young, newly diagnosed children with ASD. Ideally, factors can be identified that broaden understanding of parents' early experiences with ASD and are amenable targets for intervention and prevention efforts.

Although some parenting stress is considered to be normal and adaptive for all parents (e.g., Deater-Deckard and Scarr 1996), studies of parents raising children with ASD clearly document elevated stress levels (Koegel et al. 1992; Sanders and Morgan 1997; Smith et al. 2001; Wolf et al. 1989). The findings of increased parenting stress among parents of children with ASD have held true with the use of different measurement tools, including global estimates of being "stretched beyond their limits" (e.g., Sharpley et al. 1997), measures designed for use with children with disabilities (e.g., Holroyd 1974; Koegel et al.

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1992), and estimates of parent-related and child-related stresses based on measures designed for general population use (e.g., Dumas et al. 1991; Abidin 1990). Nonetheless, not all parents raising a child with ASD report high levels of parenting stress. For example, whereas 80% of Sharpley and colleagues' (1997) sample reported being sometimes stretched beyond their limits, the remaining 20% presumably did not perceive or report the situation to be comparably stressful.

Links between high parenting stress and concurrent problems in child and parent functioning have been demonstrated among typically developing children, and there is recent evidence of the negative effects of cumulative stress on children's behavior. For example, Crnic and colleagues (2005) found that both stressful life events and daily parenting hassles predicted negative affect and problem behaviors in a sample of typically developing preschool-aged children over a period of 2 years (Crnic et al. 2005). Examining the relationships between child characteristics and parenting stress is also of central interest in understanding the experience of parents of children with ASD. Some studies have focused on the contribution of the child's core autism behaviors to parents' stress, including deficits in social reciprocity and communication as well as repetitive and stereotypical behaviors. In one of the first studies on this topic, Bebko et al. (1987) found that parents and clinicians agreed that communication impairment, uneven cognitive abilities, and problems in social relations were the autism-related symptoms that were most stressful for mothers and fathers of school-aged children. Interestingly, however, clinicians rated parents as more stressed than they rated themselves. More recently, Hastings and Johnson (2001) found that higher parental stress was associated with higher levels of autism symptoms in a sample of 130 mothers and 11 fathers of preschool and early school-aged children with ASD. It should be noted that symptom ratings were derived from a parent checklist, and no objective measures of children's autism behaviors were employed. Thus it is possible that parents who were more stressed rated their children's behaviors as more severe. Adding to this research, Kasari and Sigman (1997) assessed children's observed social behavior in a laboratory setting and caregiver (26 mothers, 2 fathers) reports on the behavior of their preschool-aged children with ASD. Consistent with Hastings and Johnson's (2001) parent-reported data, Kasari and Sigman (1997) found that children who were more responsive in interactions with the experimenter had caregivers who reported the least parenting stress (Kasari and Sigman 1997).

Taken together, these studies suggest that autism symptoms are indeed sources of parenting stress, at least for mothers of children who are preschool-aged and older. However, there is growing understanding that children with

ASD, including toddlers, also demonstrate other challenging behaviors that are not central to the diagnosis but pose difficulties for families. Links between behavior problems and parenting stress have been established in general research on children with disabilities (e.g., Baker et al. 2002). Parents whose children have elevated scores in multiple problems areas (e.g., internalizing and externalizing problems) report even more stress than those whose children have one or no elevated score (Nachshen et al. 2005). Moreover, in children with disabilities, parental stress has been demonstrated to have a greater association with a child's behavior problems than with the child's developmental delay (Baker et al. 2003). Little is known about the relationship between behavior problems and parenting stress in ASD, and this subject has rarely been explored empirically in very young children with ASD. Recently, Lecavalier and colleagues (2006) reported that specific problem behaviors, such as externalizing behaviors, were more predictive of parent stress than adaptive behaviors in children and adolescents with ASD. In their longitudinal investigation, these authors also documented a transactional relationship over time, where behavior problems at one time point were found to be predictive of increases in caregiver stress. Similarly, using a more global estimate of problem behaviors, Hastings (2003) found that teacher ratings of child behavior problems were associated with parenting stress, but this effect was only evident for mothers and not fathers.

Studies of challenging behaviors have generally included either a total "problem behavior" score or broad scale categories such as externalizing and internalizing symptoms. However, other behaviors demonstrated by young children with ASD may be stressful for parents. For example, many regulatory problems (e.g., eating, sleeping, emotion regulation) are reported in young children with ASD (Degangi et al. 2000; Dominick et al. 2007) but there has been little explicit study of their association with parenting stress. One exception is a study by Wiggs and Stores (2001), who assessed parenting stress in parents of children with ASD undergoing treatment for sleep problems. Mothers reported significantly lower parenting stress after the sleep intervention as compared to their baseline stress and a non-intervention control group, but no treatment effects were evident for fathers' parenting stress.

Research on the associations between child behaviors and parent stress has emphasized problems and deficiencies in children's functioning, with little explicit study of children's areas of competence or developmentally appropriate skills. Competencies have been defined as behaviors that reflect the achievement of age-expected social-emotional milestones (Briggs-Gowan and Carter 1998; Carter 2002). Young children's social-emotional competencies are also important to consider given their influence on attainment of

other developmental skills and association with the emergence of subsequent problem behaviors (Carter 2002; Forman et al. 2004; Hay et al. 2000). Little research on children with ASD has explored the role of competencies in relation to parenting stress. In one recent study, Beck and colleagues (2004) found that among mothers of children with disabilities, including some children with ASD, high child problem behaviors and limited pro-social behaviors were associated with higher parenting stress. The fact that both problem behaviors and prosocial behaviors made independent contributions to parenting stress is consistent with the notion that parents view problems and delays in the acquisition of competence as related but independent constructs (Carter et al. 2003). Adaptive behavior skills were not significantly associated with stress. These findings highlight the importance of considering positive aspects of young children's behaviors as distinct from their problematic behaviors.

Although mothers have historically been the primary informants in studies of children's development and family life, fathers are increasingly included in research programs as researchers recognize the importance of fathers' involvement in the family and the advantages of using multiple informants to best understand family life. Among parents of children with ASD, comparisons between mothers and fathers in their ratings of stress and well-being have yielded mixed results. Higher stress levels have been reported among mothers in some samples (Beckman 1991; Moes et al. 1992; Sharpley et al. 1997). Many authors have attributed these findings to the larger role that mothers have historically played in daily care for children with ASD. More recent evidence suggests that mothers and fathers of children with ASD report comparable levels of stress (Hastings et al. 2005; Rimmerman et al. 2003). These findings could reflect more contemporary changes in distribution of caregiving responsibility in some families or could be better explained by differences between the samples.

Apart from similarities or differences between mothers' and fathers' reports of their stress levels, it may be useful to examine more closely the influences on stress for mothers and fathers. There is some evidence from studies of children with disabilities that mothers and fathers experience different aspects of their child's behavior as especially stressful (e.g., Keller and Honig 2004; Krauss 1993). Turning specifically to ASD, Hastings has explored a range of predictors of parenting stress and well-being among preschool and school-aged children (Hastings 2003; Hastings et al. 2005). Whereas mothers' stress was related both to child problem behaviors and fathers' mental health, fathers' stress ratings were not significantly associated with either (Hastings et al. 2005).

Parental mental health is an important consideration in the study of parenting stress, as studies have shown that

parental depression is a strong correlate of parenting stress (e.g., Gelfand et al. 1992; Maxted et al. 2005). Parents struggling with their own emotional difficulties may have fewer coping resources and feel more stressed by their children's challenging behaviors. Moreover, mothers of children with ASD typically report higher levels of depression than fathers (Hastings et al. 2005; Olsson and Hwang 2001). It is important to distinguish between the contributions to parental stress made by parental depression from those made by child-related factors. As depression may have a strong influence on parents' self-ratings of stress, and parental depression has been associated with more severe parent-rated child problem behaviors (Chilcoat and Breslau 1997), depression is included as a covariate in all models.

Delineating dimensions of children's functioning that contribute to the different components of parenting stress may aid in developing and refining parent-focused interventions. Thus, the aims of this paper are: (1) to investigate the nature of mothers' and fathers' experience of stress among parents who are newly adjusting to their toddler's diagnosis of ASD; (2) to determine whether mothers and fathers report similar or different levels of parenting stress; and (3) to examine the relation of autism symptoms, children's problems and competence behaviors, and children's cognitive level to maternal and paternal parenting stress.

Methods

Participants

The participants in this study were the first 54 families participating in a larger longitudinal study in which both mothers and fathers completed relevant questionnaires. The larger project was designed to study developmental trajectories among toddlers newly diagnosed with ASD and to examine adjustment and well-being among their families. Toddlers with autism were referred to the larger study through local early intervention programs, private specialty service providers for children with autism, state-wide conferences for families and providers of children with autism, and area medical professionals who diagnose autism. Children were excluded from the study if they had been diagnosed with a genetic disorder (e.g., Rett's syndrome, fragile X syndrome), an autism-related medical disorder (e.g., neurofibromatosis) or physically handicapping condition (e.g., cerebral palsy).

Because a primary goal of the study was to examine both mothers' and fathers' perspectives, children selected for this study if both their mother and father participated in the project. Participation from fathers was typically limited to completion of questionnaires, whereas mothers typically

participated in both interviews and questionnaires. A second criteria for selection was that only one child per family was included, even when other siblings were enrolled in the larger study. Only one child per family was included so that each parents' observation would be independent.

All 108 parent respondents (54 mothers, 54 fathers) were the biological parents of the child with ASD, with the exception of one family, in which the respondents were foster parents who had cared for the child since her birth. Per report of the mothers, 94% of couples were married and 6% were cohabiting. The majority of mothers (63%) and fathers (70%) had at least a college education. Forty-eight mothers described themselves as white (89%), one described herself as Asian, one as Hispanic, and four as "more than one race." Similarly, 47 fathers described themselves as white (87%), one described himself as Asian, two as African-American, two as Hispanic, and two as "more than one race". Mothers' average age was 36.5 years (range = 26.3–58.1; $SD = 4.8$ years) and fathers' average age was 37.9 years (range = 28.8–59.3; $SD = 6.3$ years).

Demographic information on the children was collected via maternal report. The majority of the children were boys (74%) and 14 were girls (26%). Mothers identified 83% of the children as white. The remainder was identified as Asian (2%), Hispanic (4%), and "more than one race" (11%). The children's average age at the time of the study was 26.9 months ($SD = 4.2$ months). Children were diagnosed with ASD at an average age of 23.7 months ($SD = 5.1$; range = 11–33 months). On average, children began receiving some early intervention services prior to diagnosis, at 18.4 months ($SD = 6.5$; range = 0–33), and children began receiving intensive, specialized early interventions services for ASD at 24.6 months ($SD = 4.8$; range = 14–35 months).

A series of *t*-tests for continuous variables and chi square analyses for categorical variables was run to determine if mother informants included in this report differed ($n = 54$) from the mother informants in the larger study in families in which the child's father did not complete a questionnaire booklet ($n = 44$). No differences were found across a range of family demographic variables including mothers' age, mother's level of education, and children's race. Differences between the groups approached significance on mother-reported family income ($F = 3.01$, $p < .10$, partial eta squared = .03). In addition, significant differences were found in children's age at the time of the study. Children whose fathers did not participate in the study were on average slightly older than children whose fathers did participate (mean age 28.5 ($SD = 3.5$) months versus 26.9 ($SD = 4.3$) months ($F = 4.03$, $p < .05$, partial eta squared = .04).

Procedures

A telephone screen was conducted to assess eligibility. After completing the telephone screen, two assessment sessions were scheduled and questionnaire booklets were mailed to each parent individually. Parents were encouraged to answer the questions independently and to complete the interview booklets prior to the assessment sessions.

One assessment session involved a parent interview that included the Autism Diagnostic Inventory-Revised (Lord et al. 1994), administered either in the office or home setting. The second session, which focused on children's developmental and cognitive functioning, was conducted in the laboratory and was filmed. The child visit included administration of the Autism Diagnostic Observation Schedule (Lord et al. 2000), language and cognitive standardized assessments, as well as several experimental measures designed to assess skills in joint attention and imitation. One research assistant administered all of the child direct assessments within each child visit. The parent and child visits were scheduled within 1 month of each other. Both parents signed informed consent forms and all procedures were reviewed by two university investigator review committees.

Measures

Parent Functioning

1. The Beck Anxiety Inventory (BAI; Beck et al. 1988) is a self-report measure that consists of statements that describe common symptoms of anxiety. The respondent indicates how much s/he has been bothered by each symptom on a four-point scale from "not at all" to "severely bothered." The measure shows high internal consistency ($\alpha = .92$) and high test-retest reliability over a period of 1 week. Internal consistency was also high in this sample ($\alpha = .86$ for mothers and $\alpha = .86$ for fathers).
2. The Center for Epidemiologic Studies Depression Inventory (CES-D; Radloff 1977) is a 20-item self-report scale is designed to assess depressive symptoms in adults. Parents were asked to indicate how frequently they experienced a particular symptom in the last week, with scores ranging from 0 (rarely or none of the time) to 3 (most or all of the time). The CES-D has high internal consistency ($\alpha s = .84$ –.90), modest test-retest reliability, and good criterion and discriminant validity (Radloff 1977). High internal consistency was also found for the present sample ($\alpha = .91$ for mothers and $\alpha = .89$ for fathers).

3. The Parenting Stress Index–Short Form (PSI/SF; Abidin 1990) is a self-report measure that assesses parenting stress in parents of children ages 3 months to 10 years. The PSI Short Form is comprised of 36 items pertaining to parental feelings and experiences, comprising three scales: Parental Distress, Parent–Child Dysfunctional Interaction, and Difficult Child Characteristics. The Parental Distress scale includes items relating to the parent’s feelings of being trapped in the parenting role, such as, “Since having a child I feel that I am almost never able to do things I like to do.” The Parent–Child Dysfunctional Interaction scale assesses the nature of the interactional system between the parent and child through items such as, “Most times I feel that my child does not like me and does not want to be close to me.” The Difficult Child scale assesses parent perceptions about their children, for example, “My child seems to cry or fuss more often than most children.” Parents rated their agreement with each item on a 5 point Likert scale from 1 (Strongly Agree) to 5 (Strongly Disagree). The scales have shown high internal consistency and adequate test–retest reliability and have been used widely in studies of parents of children with disabilities. In the present sample, alphas ranged from .84 to .90 for mothers across the three scales and the total scale. For fathers, alphas on these scales ranged from .84 to .92.

Child Functioning

1. The Autism Diagnostic Observation Schedule–Generic (ADOS-G; Lord et al. 2000) is a semi-structured, interactive observation schedule designed to assess social and communicative functioning in individuals suspected of having an ASD. The assessment involves a variety of social “presses” designed to elicit behaviors relevant to a diagnosis of autism. One of four modules is used, based on the child’s language level. A standardized diagnostic algorithm can be computed, composed of a subset of rated social/communicative behaviors and consistent with autism criteria in DSM-IV/ICD-10. All children in this study were administered Module 1 (preverbal or single words), with the exception of one child who was administered Module 2 (phrase speech). Because the scoring algorithms of Modules 1 and 2 are based on different item sets, the child with Module 2 ADOS scores was excluded from analyses that included the ADOS.

2. The Autism Diagnostic Interview–Revised (ADI-R; Lord et al. 1994) is an investigator-based, semi-

structured informant interview for the diagnosis of autism. As in the ADOS, a standard diagnostic algorithm can be computed using a subset of the items drawn from the ADI-R’s three sections: communication skills, social behaviors, and repetitive behaviors and interests. Items have been shown to be reliable and the algorithm scores adequately discriminate autistic individuals from a mental-age matched non-autistic comparison group (LeCouteur et al. 1989).

3. The Mullen Scales of Early Learning (Mullen 1995) provide an overall developmental composite score (Early Learning Composite) and are appropriate for children ages birth to 5 years, 8 months. The individual subtest scores target gross and fine motor skills, visual reception, receptive and expressive language. In addition to a composite cognitive standard score, the Mullen Scales provide individual standard scores in each of the domains assessed. Administration of the Mullen requires approximately 30 min. The internal median reliability coefficients ranged from 0.75 to 0.83 (Mullen 1995). Median test–retest coefficients for the cognitive scales ranged from 0.71 to 0.85. Concurrent validity with the Bayley Scales of Infant Development ranges from 0.53 to 0.59 for the cognitive scales.

4. The Infant Toddler Social Emotional Assessment (ITSEA; Carter and Briggs-Gowan 2006) is a parent-report scale that assesses young children’s social and emotional problems and competencies in four domains (Externalizing, Internalizing, Dysregulation, and Competence) and three indices (Atypical, Maladaptive, Social Relatedness). In this report, we included the four domain scores as well as the Atypical and Social Relatedness Item Cluster scores. The Atypical Item Cluster was included because it assesses the repetitive and stereotypical symptoms of ASD. The Social Relatedness Item Cluster was included because it assesses the social-communicative symptoms found in autism. The ITSEA is valid for children from 12 to 36 months. Items on the Externalizing domain scale measure Activity/Impulsivity, Aggression/Defiance, and Peer Aggression. The Internalizing domain scales include items assessing Depression/Withdrawal, General Anxiety, Separation Distress, and Inhibition to Novelty. Dysregulation includes Sleep, Negative Emotionality, Eating, and Sensory Sensitivity. Competence includes Compliance, Attention, Imitation/Play, Mastery Motivation, Empathy, and Prosocial Peer Relations. Parents rate each item on a three point scale: 0 = Not true/Rarely, 1 = Somewhat True/Sometimes, 2 = Very True/Often. The ITSEA has strong psychometric properties and correlates well with both observer ratings and other parent report measures (Carter et al. 2003; Carter and Briggs-Gowan 2006).

Results

Analytic Plan

Initial descriptive analyses examined means and rates of elevated parenting stress and affective symptoms in mothers and fathers, as well as child behavior problems and competencies as reported by both parents. For each of these constructs, the degree of association and mean level differences in maternal and paternal scores were examined utilizing Pearson correlations and *t*-tests for continuous measures and Chi Square for categorical variables.

Following these descriptive analyses, separate regression equations were computed for mothers and fathers to determine which dimensions of child behavior were associated with different aspects of parenting stress. Because statistical power for the regression models is limited, we employed a multi-stage analytic strategy. First, we examined the correlations between the total PSI score and the three PSI scales with each of the child and parent variables of interest to determine which bivariate relationships were statistically significant (Table 1).

Second, the child and parent variables were grouped into four conceptual domains: (1) autism spectrum symptoms (ADOS Communication and Reciprocal Social scores; ITSEA Social Relatedness and Atypical behaviors); (2) child problem behaviors and competencies (ITSEA Internalizing, Externalizing, Dysregulation, and Competence); (3) child cognitive functioning (Verbal IQ and Nonverbal IQ); and (4) parental affective symptoms (Depression, Anxiety). Third, preliminary regressions were run separately to determine the relative contributions of the variables within each of these domains to the four PSI outcomes (i.e., the total PSI score and the three PSI scales). Variables that were significant predictors of parenting stress at the $\alpha = .05$ level within each domain were selected and included in the final regression models.

Diagnostic and Cognitive Measures

All of the toddlers met criteria for an ASD diagnosis, (either autism or Pervasive Developmental Disorder—Not Otherwise Specified), based on our administration of the

Table 1 Correlations between Parenting Stress Index (PSI) total score and scale scores, Child functioning measures, and parental affective symptoms

	Mothers				Fathers			
	PSI total	Parent-child	Parent distress	Diff. child	PSI total	Parent-child	Parent distress	Diff. child
<i>Core autism behaviors</i>								
Communication ^A	-.05	.11	-.07	-.11	-.11	-.06	-.10	-.12
Reciprocal social ^A	-.03 _a	.19	-.08 _a	-.12 _a	.36** _b	.39**	.27 _b	.28* _b
Soc. relatedness	-.50***	-.56***	-.44***	-.31**	-.38**	-.50***	-.32**	-.17
Atypical	.15	.31*	.10	.04	.29*	.26	.15	.33*
<i>Problems and competencies</i>								
Internalizing	-.08 _a	-.09	-.06 _a	-.06 _a	.36** _b	.20	.31* _b	.37** _b
Externalizing	.30*	.14	.26	.34*	.39**	.25	.32*	.42**
Dysregulation	.46***	.38**	.26	.56**	.41**	.24	.33*	.46***
Competence	-.44***	-.47***	-.28*	-.42**	-.34*	-.50***	-.20	-.19
<i>Cognitive level</i>								
Verbal IQ	.11	-.04	.19	.09	-.08	-.18	-.07	.05
Nonverbal IQ	-.05	-.13	-.07	.04	-.26	-.33*	-.15	-.20
<i>Parental affective symptoms</i>								
Depression	.58***	.31*	.75***	.33*	.44***	.14	.73***	.19
Anxiety	.42**	.25	.53***	.23	.25	.05	.55***	-.01

Note: Communication and Reciprocal Social Interaction are from the ADOS. Social Relatedness, Atypical, Internalizing, Externalizing, Dysregulation, and Competence are ITSEA Item Cluster and Domain scores. Verbal and Nonverbal IQ scores derive from the Mullen Scales of Early Learning. Depression symptoms are from the Center for Epidemiological Studies of Depression and Anxiety symptoms are from the Beck Anxiety Inventory. Different subscripts in the same line indicate significant differences between correlations for mothers and fathers using the Fisher *r*-to-*z* transformation

^A *n* = 53 for analyses using the ADOS scores

* *p* < .05; ** *p* < .01; *** *p* < .001

ADI-R (Lord et al. 1994), the ADOS (Lord et al. 2000), and a clinical review by a licensed clinical psychologist (ASC). Children's scores from the Communication scale and the Reciprocal Social scale of the ADOS Module 1 were included in our analyses as an index of core autism symptoms. For Module 1 of the ADOS, the Communication scale cutoff scores are 4 for autism and 2 for ASD. Cutoff scores on the Reciprocal Social scale are 7 for autism and 4 for ASD. Mean scores in this sample were 4.26 ($SD = 1.5$) on the Communication scale and 10.31 ($SD = 2.7$) on the Reciprocal Social scale.

Cognitive testing on the Mullen Scales of Early Learning showed performance below age expectations across all domains. Examining T scores ($M = 50$, $SD = 10$), the average score on the Visual Reception scale was 35.7 ($SD = 11.06$), on Receptive Language 24.5 ($SD = 7.5$), on Expressive Language 29.9 ($SD = 10.4$), on Gross Motor 29.0 ($SD = 9.4$) and on Fine Motor 33.3 ($SD = 10.7$). Two summary scores were also computed to provide an estimate of Verbal IQ and Nonverbal IQ. Verbal IQ was calculated from the Mullen Receptive Language and Expressive Language scales by averaging the age equivalent scores, dividing by the child's age and multiplying by 100 to create a standard score. Nonverbal IQ was computed with the same calculation but using the Mullen Visual Reception Fine Motor age equivalent scores.

Parenting Stress

Our first aim was to examine the profiles of parenting-related stress reported by parents in our sample (Table 2). Thirty-nine percent of the mothers reported parenting stress scores that were in the clinically significant range, as indexed by the total score on the PSI. Analysis of the domain scores suggests that the most stressful area of parenting for mothers relates to the parent–child

relationship; one-half of mothers scored in the clinically significant range on the Parent–Child Dysfunctional Interaction domain. In contrast, roughly one-quarter of mothers reported clinically significant scores on the Difficult Child domain (24%) and the Parent Distress domain (26%). A similar pattern was evident for fathers, with 28% reporting clinically elevated total PSI scores. As with mothers, the highest scale scores were in the area of parent–child relationships. Thirty-nine percent of fathers reported clinically significant scores in the Parent–Child Dysfunctional Interaction domain as compared to 11% and 13% of fathers reporting scores in the clinical range on the Difficult Child domain and the Parent Distress domain, respectively. Although there were no statistically significant differences between mothers and fathers in the percentage of parents above the PSI clinical cut-points, differences between mothers and fathers approached statistical significance for the Difficult Child scale ($p < .10$) and the Parent Distress scale ($p < .10$), with trends supporting greater stress for mothers. There were no significant group differences between mothers and fathers in the levels of stress reported when comparing the continuous PSI total or scale scores.

Parental Affective Symptoms

As parental affective symptoms have been highly correlated with parenting stress and are considered important components of parental well-being, we also examined depression and anxiety symptoms among mothers and fathers in our sample (Table 2). Significantly more mothers (33%) than fathers (17%) reported depression symptom levels in the clinical range (Chi Square = 4.00, $p < .05$). There was also a trend toward higher depressive symptoms among mothers when compared to fathers ($t = 1.86$, $p < .10$, partial eta squared = .03). For anxiety symptoms, 6% of mothers and 6% of fathers reported clinically

Table 2 Mean scores and percentages in clinical range among mothers and fathers on Parenting Stress Index (PSI) and affective symptoms

	Mean (SD)				% Clinical range			
	Total ($n = 108$)	sample	Mothers ($n = 54$)	Fathers ($n = 54$)	Total ($n = 108$)	sample	Mothers ($n = 54$)	Fathers ($n = 54$)
PSI total score	81.9 (21.0)		83.8 (22.6)	79.6 (19.3)	33		39	28
Parent–child	25.9 (6.5)		26.2 (6.3)	25.7 (6.8)	44		50	39
Parent distress	27.3 (9.6)		28.3 (10.7)	26.3 (8.3)	19		26	13
Difficult child	28.5 (8.6)		29.3 (9.3)	27.7 (7.9)	18		24	11
Depression symptoms	11.7 (9.8)		13.4 (10.1)	10.1 (8.3)	25		33 _a	17 _b
Anxiety symptoms	4.8 (5.3)		5.6 (5.6)	4.1 (4.9)	12		6	6

Note: Percent in the clinical range for each scale was determined using normative guidelines provided in that scale's manual. Depression symptoms are from the Center for Epidemiological Studies Depression (CES-D). Anxiety symptoms are from the Beck Anxiety Inventory (BAI). Means with different subscripts on the same line indicate significant differences between mothers and fathers ($p < .05$)

significant symptom levels. There were also no significant differences between mothers and fathers on the continuous measure of anxiety.

Child Behaviors

Before examining the influence of child behaviors on parents’ report of stress, we examined parents’ ratings of their children’s behavior based on the four ITSEA domains and two ITSEA indices. Table 3 shows scores reported by mothers of fathers on the ITSEA, the percent of children whose scores are above the Of Concern cutpoint (extreme 10th percentile), and the correlations between mother-reported scores and father-reported scores.

There was strong agreement between mothers and fathers on their ratings of their children in the areas of Internalizing behaviors ($r = .59$), Externalizing behaviors ($r = .51$), Dysregulation ($r = .72$), Competence ($r = .60$), Social Relatedness ($r = .50$) and Atypical behaviors ($r = .43$, all $ps < .001$). No significant differences were found between maternal and paternal reports on continuous scores or the percentage of children rated above the Of Concern cutpoint for the Externalizing, Dysregulation, and Competence domains and the Social Relatedness and Atypical Item Cluster scores. However, significant differences were evident in the Of Concern cutpoint scores on the Internalizing domain (Pearson Chi Square = 4.96, $p < .05$). Maternal ratings in this domain placed more children in the Of Concern range as compared to paternal ratings. In addition, differences between maternal and paternal continuous scores on the Internalizing domain approached significance ($t = 1.94$, $p < .10$, partial eta squared = .03), also in the direction of mothers rating children with more internalizing symptoms.

Ninety-one percent of mothers and 85% of fathers rated their children with Competence scores that fell in the Of Concern range. Similarly, a high percentage of children were assigned Of Concern range scores on the Social Relatedness Item Cluster (67% by maternal report, 69% by paternal report) and the Atypical Item Cluster (56% by maternal report and 57% by paternal report). These high scores were expected given that these indices include items designed to assess autism-spectrum symptoms.

Given the elevated levels of depression observed, the relation between parental depression and children’s behavior ratings was examined to determine if depression might impact how parents view their children. Correlational analyses revealed no significant relationships between maternal and paternal self-ratings of depression and ratings of children’s behaviors on the ITSEA.

Regression Models

As described in the analytic plan above, final regression models were based on preliminary models that examined the contribution of variables in four conceptual domains: autism spectrum symptoms, child problem behaviors and competencies, child cognitive functioning, and parental affective symptoms. These regressions were run separately for mothers and fathers to determine the relative contributions to the four parenting stress outcomes (i.e., the total PSI score and the three PSI scales). In final models, a stepwise linear regression procedure was employed to evaluate the unique contributions of each domain. For questionnaire data, each parents’ self-reported stress, depression and anxiety scores were examined in conjunction with their report on their child’s behavior (i.e., maternal stress and maternal child ratings).

Table 3 Mothers’ and fathers’ reports on their children’s social-emotional behaviors

	Mean score (<i>SD</i>)		% scores Of Concern		Mother–father correlations <i>r</i> ($n = 108$)
	Mother ($n = 54$)	Father ($n = 54$)	Mother ($n = 54$)	Father ($n = 54$)	
ITSEA domains					
Internalizing behaviors	0.57 (.23)	0.49 (.20)	17 _a	4 _b	.59*
Externalizing behaviors	0.47 (.25)	0.47 (.21)	6	6	.51*
Dysregulation	0.59 (.31)	0.59 (.27)	22	20	.72*
Competence	0.76 (.24)	0.79 (.25)	91	85	.60*
ITSEA indices					
Social relatedness	1.25 (.29)	1.19 (.34)	67	69	.50*
Atypical behaviors	0.81 (.33)	0.80 (.38)	56	57	.43*

Note: Different subscripts in the same row indicate a significant difference in the percent of children in the “Of Concern” range (Pearson Chi Square = 4.96, $p < .05$)

* $p < .001$

First, predictors of overall parenting stress as measured by the total score on the PSI were examined (see Table 4). For mothers, preliminary analyses indicated that ITSEA Social Relatedness, ITSEA Dysregulation, ITSEA Competence and maternal depression should be retained in the final model. Together, these variables explained 56% of the variance in parenting stress ($F(4,49) = 15.50, p < .001$). Unique predictors of overall parenting stress for mothers were ITSEA Social Relatedness, ITSEA Dysregulation and maternal depression (see Table 4). The final regression model for fathers included all of the core autism measures (ADOS Reciprocal Social and Communication, as well as ITSEA Atypical Behaviors and ITSEA Social Relatedness), ITSEA Externalizing, ITSEA Competence, and paternal depression. Together these variables explained 58% of the variance in stress ($F(7,45) = 8.83, p < .001$). Unique predictors of fathers' parenting stress were Reciprocal Social scores, externalizing behaviors and paternal depression.

Next, regression models were employed to examine the three scales that comprise the PSI to determine whether the predictors differed depending on the aspect of parenting stress assessed (Table 5 for mothers and Table 6 for fathers). On the Parent–Child Dysfunctional Interaction domain results of the preliminary analyses for mothers indicated that ITSEA Social Relatedness, ITSEA Dysregulation, and ITSEA Competence should be retained in the final model. This model explained 42% of the variance and

was significant ($F(3, 50) = 11.94, p < .001$). However, only ITSEA Social Relatedness and ITSEA Dysregulation contributed unique variance to the model. The final model for fathers included the ADOS Reciprocal Social, ADOS Communication, ITSEA Social Relatedness, ITSEA Competence, and Nonverbal IQ scores. This overall model was significant ($F(5, 47) = 7.00, p < .001$) and explained 43% of the variance. The ADOS Reciprocal Social score was the only significant unique predictor of parent–child stress, although there was a trend toward significance in the ADOS Communication score as well ($t = -1.96, p < .10$).

In the Parent Distress domain, based on the preliminary regressions, the final model for mothers included ITSEA Social Relatedness and parental depressive symptoms. This overall model explained 62% of the variance in Parent Distress ($F(2,51) = 40.70, p < .001$). ITSEA Social Relatedness accounted for 20% of the variance in the first step and maternal depressive symptoms added an additional 42% of unique variance. For fathers, ADOS Reciprocal Social and depression scores were entered in the final model, which explained 57% of the variance ($F(2,50) = 32.51, p < .001$). Only paternal depressive symptoms were a unique predictor of Parent Distress.

Last, predictors of the Difficult Child domain were examined. Three ITSEA variables were entered into the final model for mothers: Internalizing, Dysregulation, and Competence. This overall model was significant and explained 44% of the variance ($F(3,50) = 13.26,$

Table 4 Regression analyses predicting to mothers' and fathers' overall parenting stress (PSI)

	Mothers total PSI			Fathers total PSI		
	β upon entry	β final model	ΔR^2	β upon entry	β final model	ΔR^2
1. Core autism behaviors			.25			.35
Communication ^a				-.32*	-.19	
Reciprocal social ^a				.41**	.30*	
Social relatedness	-.50***	-.24*		-.24	-.19	
Atypical				.23	.17	
2. Problems and competencies			.16			.11
Internalizing						
Externalizing				.34**	.30**	
Dysregulation	.35**	.28**				
Competence	-.17 ns	-.16 ns		-.08	-.14	
3. Depression	.42***	.42***	.16	.37***	.37***	.12
Total R^2			.56			.58
Model F -value			15.50***			8.83***

Note: Data displayed in the table derive from variables that were retained from the preliminary regression models to include in the final models. Empty cells indicate that those variables were not significant predictors in the preliminary models. Communication and Reciprocal Social Interaction are ADOS scores. Social Relatedness, Atypical, Internalizing, Externalizing, Dysregulation, and Competence are ITSEA Item Cluster and Domain scores. Depression symptoms from the Center for Epidemiological Studies of Depression (CES-D)

^a $n = 53$ for analyses using the ADOS scores

* $p < .05$; ** $p < .01$; *** $p < .001$

Table 5 Regression Analyses Predicting to Mothers' Parenting Stress

	Parent-child					Parent distress					Difficult child				
	β entry	upon	β model	final	ΔR^2	β entry	upon	β model	final	ΔR^2	β entry	upon	β model	final	ΔR^2
1. Core autism behaviors					.32					.20					
Social relatedness	-.56***		-.42**			-.44***		-.25**			-				
2. Problems and competencies					.10										
Internalizing											-.22		-.22		
Dysregulation	.26*		.26*								.56***		.56***		
Competence	-.18		-.18								-.28*		-.28*		
3. Depression						.68***		.68***		.42					
Total R^2					.42					.62					.44
Model F -value					11.94***					40.70***					13.26***

Note: Data displayed in the table derive from variables that were retained from the preliminary regression models to include in the final models. Empty cells indicate that those variables were not significant predictors in the preliminary models. Social Relatedness, Internalizing, Dysregulation, and Competence are ITSEA Item Cluster and Domain scores. Depression symptoms from the Center for Epidemiological Studies of Depression (CES-D)

* $p < .05$; ** $p < .01$; *** $p < .001$

Table 6 Regression analyses predicting to fathers' parenting stress

	Parent-child				Parent distress				Difficult child			
	β upon entry	β final model	ΔR^2		β upon entry	β final model	ΔR^2		β upon entry	β final model	ΔR^2	
1. Core autism behaviors			.37				.07					.25
Reciprocal social ^a	.40**	.35*			.27	.15			.37*	.37**		
Communication ^a	-.21	-.25							-.35*	-.25		
Social relatedness	-.40***	-.23										
Atypical									.31*	.25*		
2. Problems and competencies		.05										.11
Externalizing									.34**	.34**		
Competence	-.28*	-.25										
3. Nonverbal IQ	-.12	-.12	.01									
4. Depression					.71***	.71***	.50					
Total R^2			.43				.57					.36
Model F -value			7.00***				32.51***					6.60***

Note: Data displayed in the table derive from variables that were retained from the preliminary regression models to include in the final models. Empty cells indicate that those variables were not significant predictors in the preliminary models. Communication and Recip Social Interaction are ADOS scores. Social Relatedness, Atypical, Externalizing, and Competence are ITSEA Item Cluster and Domain. Depression symptoms from the Center for Epidemiological Studies of Depression (CES-D)

^a $n = 53$ for analyses using the ADOS scores

* $p < .05$; ** $p < .01$; *** $p < .001$

$p < .001$). Dysregulation and Competence were significant unique predictors, whereas ratings of Internalizing behaviors approached significance ($p < .10$). The final model for fathers included ITSEA Atypical Behaviors, ADOS Reciprocal Social and ADOS Communication scores in the first step and ITSEA Externalizing Behaviors in the second

step. The overall model was significant ($F(4, 48) = 6.60$, $p < .001$) and explained 36% of the variance. Both ADOS Reciprocal Social and Communication scores, along with the ITSEA Externalizing score, were unique predictors. Fathers' ratings of externalizing behaviors contributed an additional 11% of the variance above the autism symptoms.

Discussion

The results of this study add to a large body of research documenting high levels of parenting stress and depressive symptoms among mothers raising a child with ASD (e.g., Schopler and Mesibov 1984). Moreover, this study extends prior work by documenting that high levels of stress are present in mothers when their children are quite young, and also provides evidence that fathers of very young children share high levels of stress and depressive symptoms. Given the unique challenges inherent in raising a child with ASD, in particular during the time surrounding diagnosis and initiation of intervention services, it is not surprising that many mothers and fathers of recently diagnosed toddlers evidence high levels of stress. Also of note is that at least half parents studied did not evidence clinically significant levels of parenting stress or depressive symptoms. Taken together, these findings highlight the need to assess parental stress and depressive symptoms while at the same time recognizing that many families bring important strengths in coping and adjusting to the diagnosis of ASD.

Very few past studies have examined stress in both mothers and fathers, especially with children in this very young age group. Although some earlier work suggested higher levels of stress in mothers (e.g., Moes et al. 1992), our findings are in keeping with more recent work suggesting a commonality in parents' experience (Hastings 2003). Although there were no significant differences between mothers' and fathers' mean scores and effect sizes for mother–father comparisons were small, it is important to note that mothers' parenting stress and depression scores were uniformly higher than fathers' scores. Consistent with this, trend level findings were obtained with more mothers than fathers scoring above the clinical cutpoints, suggesting that significant differences may emerge in larger samples. Following these families over time will be necessary to determine whether mothers become more stressed than fathers as their children get older, as studies of older children would suggest (e.g., Moes et al. 1992), and/or whether parenting stress diminishes over time as parents adapt and make family accommodations to the demands of raising a child with ASD.

A second important finding from our work is that mothers and fathers of toddlers with ASD share a highly concordant view of their child's behaviors, both with respect to autism symptoms and other social-emotional and behavior problems and delays in the acquisition of competencies that their children manifest. These findings are in keeping with Baker and colleagues (2003), who found moderate agreement between mothers and fathers in their reports about their child's problem behaviors using the Child Behavior Checklist in children with delays and with Carter et al. (2003) in a comparison of mothers and fathers

of typically developing children on the ITSEA. Whereas many past studies have been criticized for using only mothers' report about children's home behaviors, these results suggest that one parent's questionnaire data about a child's behavior may capture predominant perceptions of the child in the family home. In addition, the fact that we did not find a relationship between parental depression and parents' report about their children's functioning suggests that parental depression may play less of a role in parental appraisal of children's behavior when children have ASD than among samples of typically developing children.

The central finding of this study is that despite overall similarity in parents' stress ratings and similarity in parent report of child behaviors, different aspects of children's behaviors are predictive of parenting stress for mothers and fathers. Although there were some commonalities between mothers and fathers with respect to predictors of stress, the degree to which behavior problems and competencies are perceived as stressful varies across mothers and fathers and varies by the type of parenting stress that is assessed.

The most consistent predictor of parenting stress for both mothers and fathers across the components of parenting stress that were assessed was children's delays/deficits in social skills as measured with the ADOS Reciprocal Social Interaction score and the ITSEA Social Relatedness Item Cluster. For fathers, observed social interaction skills during the ADOS were predictive of overall stress as well as parent–child relationship stresses and fathers' appraisal of the child as “difficult.” Mothers were similarly impacted by social deficits, but significant relationships were found with the ITSEA behavior ratings and not with observed social and communication behaviors on the ADOS. Mothers who reported that their children had low levels of social relatedness on the ITSEA also reported higher overall parenting stress, higher stress in the area of parent–child relationships and more parent distress. Interestingly, social relatedness was not related to mothers' appraisal of aspects of their child's behavior that they find challenging or annoying (i.e., the PSI Difficult Child scale). In contrast to items on the parent–child relationship scale that focus more directly on children's ability to socially engage with the parent (e.g., “When I do things for my child I get the feeling that my efforts are not appreciated very much”), items on the Difficult Child scale are focused on discrete behavior problems (e.g., “My child's sleeping or eating schedule was much harder to establish than I expected.”).

Whereas little past research has examined both autism symptoms and other behavior problems and competencies in these young children with ASD, we assessed the degree to which both types of problems may be stressful for parents. In addition to impaired social skills, behavior problems that are not clinical manifestations of ASD were

also associated with parental stress. Mothers were especially affected by children's difficulty with self-regulation skills (e.g., eating, sleeping, and emotion regulation), which may impact mothers more as they are generally more involved in daily child care tasks. For fathers, externalizing behaviors were the primary non-core autism behavior that was associated with stress. These behaviors can be difficult to manage and can draw negative attention in public settings, which may be most uncomfortable for fathers. It is notable that regulatory problems and externalizing behaviors were significantly correlated with stress for both mothers and fathers when examined independently in bivariate correlations. However different patterns emerged for mothers and fathers when these behaviors were examined in relation to other aspects of child functioning in multivariate regression equations. The multivariate results highlight that mothers and fathers may find different aspects of their children's behaviors particularly stressful.

Surprisingly, cognitive and verbal functioning were not salient predictors of stress for mothers or fathers. In addition, other autism-related symptoms, including autism specific communication skills and atypical behaviors, were not salient predictors of stress for mothers and were only associated with fathers' perceptions of child difficulty. These results are interesting in light of past research demonstrating that parents find communication deficits stressful (e.g., Bebko et al. 1987), as well as other studies linking stress to the atypical or odd behaviors common in individuals with ASD (e.g., Tomanik et al. 2004). As these studies were conducted on older children with ASD, differences in these findings may be related to the younger age of this sample. It is possible that parents of very young children do not, as a group, have clear expectations for age-appropriate language and developmental functioning and thus limitations in these areas are not construed as stressful. In contrast, deficits in skills related to social interaction, which typically developing children demonstrate so readily and with ease, may be much more evident to these parents. In addition, given that all families in this study were participating in high intensity early intervention services with a strong emphasis on developing language and communication skills, parents may be optimistic that their children will make significant gains in these areas.

As more young children with ASD and their families are entering the early intervention system, there is a growing need to better understand the experience of these families. In contrast to most past studies on parenting stress, which have included older children (preschool or older) or a broad age range of children (e.g., 3–17 years in Koegel et al. 1992), our sample included parents of very young children (ages 18–33 months of age). All of these parents were new to the diagnosis of ASD, having received the diagnosis on average

about 3 months prior to study entry, and having begun intensive services for autism on average roughly 2 months prior to joining the study. Thus, the very high parenting stress levels observed may be in part due to what has been considered a crisis period of the early adaptation to the diagnosis.

Limitations of the current study include a relatively small convenience sample and a single assessment point. With a larger sample, it would be possible to cluster children with different developmental and behavioral profiles to assess whether there are combinations of child factors that are uniquely stressful for parents (e.g., low language skills, sleep problems, and high atypical repetitive behaviors). Moreover, generalizability of the findings is limited because the sample is relatively homogeneous with respect to ethnicity, race, and socioeconomic status and the high level of autism-specific services families were receiving. In addition, longitudinal assessments of parental stress and depression and child functioning will aid in the identification of families with persistently high levels of stress and those families for whom high stress is most apparent during salient transition periods (e.g., diagnosis, transition to school). As this study used cross-sectional data, it is not possible to determine the direction of effects between depression and parenting stress. Furthermore, the cross-sectional design precludes any conclusions regarding causality, and in fact it would be expected that there are bidirectional relationship between these variables. For some parents, the experience of depression may be so emotionally overwhelming that their functioning in a multiple aspects of their lives, including parenting, is very limited. In other cases, the high level of stress that is experienced in raising a child with developmental problems may lead to the cognitions and emotions that are associated with depression.

Because social relatedness is at the very core of autism and deficits in this area are likely the focus of much of the autism intervention, the fact that these characteristics are most stressful for parents is important for professionals to know when working with families of young children. As families learn more about autism and about their individual child's capacity and style of social engagement, parenting stress associated with the appraisal of children's limited social relatedness may diminish. For the subset of families who are experiencing clinically significant levels of stress immediately following their young child's diagnosis, these findings highlight the need for family interventions to take into consideration the ways in which mothers' and fathers' experiences are unique.

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