

Mother–Child Relationship Quality Among Adolescents and Adults With Autism

Gael I. Orsmond

Sargent College of Health and Rehabilitation Sciences, Boston University

Marsha Mailick Seltzer and Jan S. Greenberg

Waisman Center, University of Wisconsin-Madison

Marty Wyngaarden Krauss

Heller School for Social Policy and Management, Brandeis University

Abstract

The mother–child relationship in families of 202 adolescents and adults with an autism spectrum disorder living at home and its association with maternal caregiving gains and strains were examined. Findings indicate a wide range of variability in the quality of the mother–child relationship, although most were characterized as positive across multiple measures. Characteristics of the son or daughter with autism (less severe maladaptive behaviors, better health, and less social impairments) and characteristics of the mother (lower levels of pessimism) were predictive of more positive mother–child relationships. In turn, specific aspects of the mother–child relationship (greater positive affect and warmth), along with other child and maternal characteristics, predicted fewer maternal caregiving strains and, to a lesser extent, greater caregiving gains.

In this study we examined the quality of relationships between mothers and their adolescent or adult son or daughter with an autism spectrum disorder. The key building blocks for social relationships (i.e., communication, social understanding, and emotional responsiveness) are impaired in individuals with autism (Travis & Sigman, 1998). The social deficit of autism is marked by impairment in the use of nonverbal behaviors to regulate social interaction (e.g., gestures, eye contact), a lack of shared enjoyment with others, and a general lack of social or emotional reciprocity (American Psychiatric Association, 2000). Although studied more frequently in young children, there is evidence that the social impairments characteristic of persons with autism persist throughout their life (Howlin, Mawhood, & Rutter, 2000; Seltzer et al., 2003; Seltzer, Shattuck, Abbeduto, & Greenberg, 2004). However, the extent to which these persistent impairments affect

the mother–child relationship in adolescence and adulthood has not been previously studied and is of importance to understanding the natural course of the disorder and its impact on the family (Travis & Sigman, 1998).

In the past, researchers have focused on attachment relationships and interactions between young children with autism and their mothers (e.g., Capps, Sigman, & Mundy, 1994; Dawson, Hill, Spencer, Galpert, & Watson, 1990; Dissanayake & Crossley, 1996; Joseph & Tager-Flusberg, 1997; Kasari & Sigman, 1997). This research shows that despite the communication and social challenges associated with autism, young children with the disorder do become attached to and show positive interactions with their mothers, although mothers may experience the relationship as quite different from those they have with their other children (see Rutgers, Bakermans-Kranenburg, van Ijzendoorn, & van Berckelaer-Onnes,

2004, for a review). However, it is not known whether the bonds of attachment between mother and child remain strong as the young child grows up or whether the symptoms of autism take a lasting toll on the mother-child relationship.

In this study we focus on three dimensions of mother-child relationship quality: positive affect, expressed emotion, and warmth. The construct of positive affect is derived from Bengtson and colleagues' conceptualization of intergenerational solidarity (Bengtson, Olander, & Haddad, 1976; Bengtson & Roberts, 1991), which has been one of the most productive organizing frameworks for understanding family relationships in adulthood (Luescher & Pillemer, 1998). Results of past research shows that greater positive affect expressed by mothers toward their adult child with autism is associated with greater maternal optimism, more positive psychological well-being, and lower levels of depressive symptoms (Greenberg, Seltzer, Krauss, Chou, & Hong, 2004). Furthermore, both affection expressed by the mother for the adult child and affection perceived by the mother to be reciprocated by the child have been shown to be positively associated with the mother's report of caregiving satisfaction and caregiving burden in studies of mothers of adults with developmental disabilities (Pruchno, 2003). Thus, positive affect in the mother-child relationship has been implicated in maintaining maternal well-being, both with respect to psychological and physical well-being (e.g., Greenberg et al., 2004) and in terms of well-being related to the caregiver role (e.g., Pruchno, 2003). In this study we examined variation in positive affect in the mother-child relationship, the degree to which it is perceived by the mother to be reciprocated by the adolescent or adult with autism, its relationship with independent ratings of the mother-child relationship, its predictors, and its associations with the mother's experience of caregiving.

We also used expressed emotion as an indicator of the quality of the mother-child relationship. *Expressed emotion* was originally conceptualized as a family factor predictive of relapse in individuals with schizophrenia (Brown, Birley, & Wing, 1972; Vaughn & Leff, 1976a) and was defined as high levels of criticism and/or over-involvement as expressed by a family member toward a person with schizophrenia. Recently, expressed emotion has come to be viewed more broadly as a measure of the emotional relationship between parent and child and has been ex-

plored in samples of families of individuals with developmental disabilities (e.g., Beck, Daley, Hastings, & Stevenson, 2004; Dossetor, Nicol, Stretch, & Rajkhowa, 1994; Greedharry, 1987). In general, in families of children with developmental disabilities, about one quarter to one third of families are rated as high in criticism and/or over-involvement (Dossetor et al., 1994; Greedharry, 1987). Diagnostic group comparisons have indicated that mothers of children with developmental disabilities show lower levels of expressed emotion than do mothers of children with psychiatric disorders (Steketee, van Noppen, Lam, & Shapior, 1998; Peris & Baker, 2000), yet higher than the comparison (no disability) mothers.

In the past, researchers have shown that characteristics of both the child with developmental disabilities and the mother influence ratings of maternal expressed emotion. Dossetor et al. (1994) found that high levels of maternal criticism were observed when the son or daughter with developmental disabilities had more difficult behavior problems. High levels of criticism were more likely when the child had *less* severe functional impairment, whereas high levels of over-involvement were evident when the child had *more* severe functional impairment. In addition, higher levels of over-involvement were associated with poorer maternal psychological well-being, poorer marital quality, less social support from friends and relatives, and greater professional support. Dossetor et al. concluded that high levels of expressed emotion could be the product of extended periods of family caregiving and that both child and maternal characteristics influence maternal demonstration of expressed emotion.

Maternal warmth is the third measure of the mother-child relationship that we included. Historically, mothers of children with autism were characterized as lacking in warmth, for example, they were called "refrigerator mothers" (Bettelheim, 1967), and were blamed for causing their child's disability as a result of this personality characteristic. Currently, autism is recognized as a complex neurobiological disorder, not caused by parenting style; nevertheless, the social impairments of autism may have a negative effect on the mother-child relationship, which may in turn result in lower levels of maternal warmth. No previous researchers have examined maternal warmth in families of children with autism, although there is some evidence that higher levels of maternal warmth are related to better outcomes for persons

with schizophrenia (Bertrando et al., 1992; Ivanoic, Vuletic, & Bebbington, 1994; Weisman, Lopez, Karno, & Jenkins, 1993).

Based on this literature, we examined the relationship between mothers and their coresident adolescents and adults with an autism spectrum disorder. We restricted this study to adolescents and adults who lived at home with their mother because dyads not coresiding are likely to have qualitatively different relationships than those who live in the same households. We focused on the mother–child relationship because research on parents of children with developmental disabilities has shown that, as compared with fathers, mothers tend to assume the primary caregiver role, even more so than in the general population (Bristol, Gallagher, & Schopler, 1988; Grant, 1986; Heller, Hsieh, & Rowitz, 1997) and report a closer parent–child relationship characterized by more positive affect than do fathers (Essex, 2002). We asked the following research questions. First, to what extent is there variation in the quality of the mother–child relationship among mothers and their adolescents and adults with autism, as measured by positive affect, expressed emotion, and warmth? Second, what maternal and child characteristics predict variation in these three dimensions of the mother–child relationship? Third, to what extent are these dimensions associated with the mother’s experience of caregiving, as indicated by her appraisal of caregiving gains and caregiving strains?

We examined whether the following characteristics of the individual with autism were predictive of the quality of the mother–child relationship and of caregiving gains and strains: age, a comorbid diagnosis of mental retardation, gender, health, and behavioral characteristics associated with autism. We controlled for age of the individual with autism because research on autism suggests an increase in family stress during adolescence as compared with childhood, with possible decreased stress levels in adulthood (Seltzer & Krauss, 2001; Seltzer et al., 2003). We included a comorbid diagnosis of mental retardation in order to examine the question of whether mental retardation, in addition to autism, affects the mother–child relationship and the mother’s caregiving experience. Similarly, gender of the individual with autism was included because it has been shown that mother–child relationships across the life course vary with the gender of the child (Rossi & Rossi, 1990). We included health of the adoles-

cent or adult with autism because prior research has indicated greater caregiving burden associated with poorer health in adults with mental retardation (Heller et al., 1997). Finally, we examined maladaptive behaviors because prior research has shown that maladaptive behaviors in adults with mental retardation can erode the mother–child relationship and, consequently, can affect maternal feelings about the caregiving experience (Essex, 2002; Greenberg, Seltzer, & Greenley, 1993; Orsmond, Seltzer, & Krauss, 2003; Pruchno, Patrick, & Burant, 1996).

Certain maternal characteristics also have been shown to have an effect on the mother–child relationship and the caregiving experience, and we therefore examined the influence of maternal pessimism, self-esteem, and marital status. The mother–child relationship has been shown to be adversely affected by maternal pessimism about the child’s future (Bristol & Schopler, 1983; Hauser-Cram & Krauss, 2004) and low self-esteem (Demo, Small, & Savin-Williams, 1987; Li & Seltzer, 2005). Finally, although some researchers have found that marital status was not associated with caregiver burden (e.g., Greenberg, 1995), we included it in our model to further assess the potential influence of spousal social support and greater financial resources.

Method

Participants

Participants included a subsample of the families of 407 adolescents and adults with an autism spectrum disorder who have been followed in an ongoing (4-wave) longitudinal study (Seltzer et al., 2003). The families resided in Wisconsin ($n = 203$) or Massachusetts ($n = 204$) when the study began. Identical recruitment procedures were used in the two states (i.e., informational packets were sent out by agencies, schools, diagnostic clinics, and via announcements made through the media). Data for the present study were taken from the second wave of the Seltzer et al. research (Time 2, conducted in 2000–2001), which was the point of data collection when all the variables of interest in the present analysis were included.

The families met three criteria when initially recruited: (a) the son or daughter was age 10 or older; (b) he or she had received a diagnosis on the autism spectrum from a medical, psychological, or educational professional, as reported by the parents; and (c) administration of the Autism Di-

agnostic Interview–Revised—ADI-R (Lord, Rutter, & Le Couteur, 1994) confirmed the parental report of an autism spectrum disorder. Of the 407 individuals in the sample, 385 (94.6%) met all four criteria for autism on the ADI-R (qualitative impairments in communication and language; qualitative impairments in reciprocal social interaction; repetitive, restrictive, and stereotyped behaviors; and onset of symptoms prior to 18 months). The remaining 22 individuals (5.4% of the sample) demonstrated a pattern of impairments on the ADI-R that was consistent with their diagnosis of Asperger’s Disorder or Pervasive Developmental Disorder–Not Otherwise Specified. Participants excluded from the present study included 12 fathers and 1 grandmother who were the primary respondents for the study. Of the 52 families for whom we did not have data at Time 2, 3 mothers and 2 individuals with autism had died, 22 mothers decided not to continue with the study, 6 mothers completed only partial data, and 18 mothers could not be located. An additional 133 cases were eliminated because the son or daughter lived outside the parental home. Selecting only one child from families with multiple children with autism resulted in the loss of an additional 7 sample members. We used the following selection criteria in these cases of multiple siblings: (a) we selected the child living at home if one was living at home and one was living away from home, (b) we selected the older child if both were living at home, and (c) a child was randomly selected in the cases of twins and one case of triplets, all of whom lived at home.

The 202 adolescents and adults with autism spectrum disorder included in our subsample ranged in age from 11 to 48 years at Time 2 ($M = 19.8$). The majority of the sample was male (73%), reflective of the higher prevalence of autism in males compared with females (American Psychiatric Association, 2000). Over half of the participants (60.4%) had been given a diagnosis of mental retardation. Most (81.2%) spoke in three-word phrases or sentences; fewer spoke only in single words (4.5%) or were nonverbal (13.9%).

The mothers ranged in age from 33 to 80 years at Time 2 ($M = 49.0$). Most were married (79.2%). Nearly all had completed high school (98%), and almost three quarters (70.8%) were employed either part- or fulltime. The average annual household income in 2000–2001 was between \$50,000 to \$60,000. Most mothers were White; there were only 7.9% persons of color.

Procedure and Measures

Mothers participated in a 2- to 3-hour in-home interview and completed two self-administered questionnaires.

Mother–child relationship quality. Three indicators of the quality of the mother–child relationship were included: positive affect, expressed emotion, and maternal warmth. Positive affect was measured by the Positive Affect Index (Bengtson & Schrader, 1982), which assesses the mother’s perception of affective solidarity with her son or daughter. Ten self-report items were used from this scale: 5 questions addressing the mother’s feelings of positive affect toward her son or daughter (e.g., “How much affection do you have toward your son/daughter?”) and 5 questions representing the mother’s perception of positive affect from her son or daughter (e.g., “How much affection do you feel that your son/daughter has for you?”), each rated on a 6-point scale (1 = *not at all*, 2 = *not much*, 3 = *some*, 4 = *pretty much*, 5 = *very much*, 6 = *extremely*). Each set of 5 questions addresses the dimensions of understanding, trust, fairness, respect, and affection in the relationship. In this study, we used the 10 individual items and 2 summary scores representing positive affect toward the son or daughter and positive affect perceived from the son or daughter.

Construct and discriminant validity of the Positive Affect Index have been examined (Bengtson & Allen, 1993; Bengtson & Schrader, 1982). The items on the Positive Affect Index load highly on a single factor, with relatively uniform loadings. Construct validity has been supported by demonstrating that factor analysis yields distinct factors for different family members (e.g., child and parent both reporting on relationship with one another). In addition, use of this measure in other studies with mothers of adults with mental illness and mental retardation has shown that the measure discriminates between groups in expected ways, with mothers of adults with mental retardation reporting greater positive affect in the relationship than did mothers of adults with mental illness (Greenberg et al., 2004). In this sample, the Cronbach’s alpha was .76 and .83 for the two subscales measuring positive affect toward and positive affect from the son or daughter, respectively.

Our second indicator of the quality of the relationship, expressed emotion, was coded based on the Five-Minute Speech Sample, following the standardized procedures described in the coding

manual developed by Magaña, Goldstein, Karno, Miklowitz, Jenkins, and Falloon (1986). The mother was asked to speak about her son or daughter for 5 minutes uninterrupted. The speech sample was taperecorded, transcribed, and rated as *high* (coded 5), *borderline* (coded 3), or *low* (coded 0) along the dimensions of criticism and emotional over-involvement.

Respondents were rated as high on criticism if they made a negative opening remark, if they described their relationship with their son or daughter in negative terms, or if they made one or more criticisms about their son or daughter during the course of the Five-Minute Speech Sample. Respondents were rated as borderline on criticism if they did not satisfy the above requirements but, nevertheless, made one or more statements of dissatisfaction with the relationship with their son or daughter. A rating of low was given in the absence of any critical comments.

In the context of expressed emotion research, emotional over-involvement is not indicated by protective behaviors that are necessary and reasonable within the context of ensuring the safety and well-being of a child with a disability. Rather, it is meant to capture an extreme response that is overly protective given the child's developmental and functional capabilities. Emotional over-involvement was rated as high if the mother either expressed excessive self-sacrificing or overprotective feelings toward the son or daughter or experienced an emotional display (e.g., crying) during the Five-Minute Speech Sample. Also, emotional over-involvement was rated as high if two of the following behaviors were present: excessive detail about the son or daughter's past; a statement of attitude (e.g., "I will do anything for my child"); or excessive praise of the son or daughter, as indicated by five or more positive remarks. A rating of borderline emotional over-involvement was given if there was some evidence of over-involvement (e.g., excessive detail about the past or excessive praise) but the full criteria for high emotional over-involvement were not met. Low emotional over-involvement represents the absence of such indicators.

Mothers were classified as high in expressed emotion if they were rated as high on criticism and/or emotional over-involvement. In the present study, all expressed emotion ratings were performed by a rater with 20 years of experience in coding the Five-Minute Speech Sample. In addition, a second experienced rater independently

coded 30 taped speech samples. Their level of agreement was 83.3%. Although initially expressed emotion was seen as a unitary dimension reflecting high levels of criticism and/or high levels of emotional over-involvement, more recently the components of expressed emotion have been evaluated separately (e.g., Peris & Baker, 2000), which is the approach we used in this study.

The third indicator of the quality of the relationship was maternal warmth, also rated from the Five-Minute Speech Sample, based on guidelines developed for rating warmth from the Camberwell Family Interview (Vaughn & Leff, 1976b). Although the rating of warmth was not used in calculating expressed emotion, in several studies of families of persons with mental illness, researchers found that higher levels of warmth were related to a reduced risk of relapse, suggesting that high levels of relationship warmth may be an important protective factor in families who have members with disabilities (Bertrando et al., 1992; Ivanovic, Vuletic, & Bebbington, 1994; Weisman et al., 1993). Level of warmth, rated on a 5-point scale from 0 (*no warmth*) to 4 (*high warmth*), is based on the tone of voice; spontaneity of expression of sympathy, concern, and empathy; and the expression of interest in the child with autism. All ratings of warmth were performed by the same rater who coded expressed emotion and who has over 2 decades of experience coding warmth from the full Camberwell Family Interview. In addition, a second experienced rater independently coded 15 taped speech samples. The correlation between the two ratings of warmth was .79.

Caregiving strains and gains. Caregiving strains were measured with the Zarit Burden Interview (Zarit, Reever, & Bach-Peterson, 1980). This scale represents potential problems a caregiver may experience as a result of the caregiving demands of her son or daughter. Mothers rated 29 items on a 3-point scale from 1 (*not at all true*) to 3 (*extremely true*). An example of a question from the Zarit Burden Interview is, "Because of my involvement with my son/daughter I don't have enough time for myself." According to coding conventions, three positively coded items are subtracted from the total score, resulting in a maximum score of 78 (Zarit et al., 1980). Scores for mothers in this study ranged from 18 to 66 ($M = 35.66$, $SD = 9.06$, $\alpha = .88$), considerably higher (i.e., greater burden) than scores reported for family caregivers of persons with Alzheimer's disease ($M = 30.8$) (Zarit et al., 1980).

Caregiving gains were measured with a scale developed by Pearlin (1988) originally used with caregivers of persons with Alzheimer's disease. Mothers were asked to rate how much having a son or daughter with autism helped them discover strengths and skills they never knew they had, such as in the following question, "How much have you become more aware of your inner strengths?" For each of the 10 items, mothers indicated on a 4-point scale (from 0 = *not at all* to 3 = *a lot*) the degree to which they experienced positive change as a result of caring for their son or daughter with autism. Scores ranged from 0 to 30 ($M = 22.39$, $SD = 5.53$, $\alpha = .85$), similar to scores reported for family caregivers of persons with schizophrenia ($M = 20.9$) (Chen & Greenberg, 2004).

Characteristics of the son/daughter with autism spectrum disorder and of the mother. We examined several characteristics of the son or daughter with autism and of the mother, which were hypothesized to be associated with the mother-child relationship as well as caregiving gains and strains. Characteristics of the son or daughter included age, comorbid diagnosis of mental retardation, gender, health, and impairments and behaviors associated with autism. Age was coded in years. We determined mental retardation status using a variety of sources of information: the Wide Range Intelligence Test (Glutting, Adams, & Sheslow, 2000) for IQ and the Vineland Screener (Sparrow, Carter, & Cicchetti, 1993) for adaptive behavior. Individuals with standard scores of 70 or below on both measures were classified as having mental retardation, consistent with diagnostic guidelines (Luckasson et al., 2002). Those with scores above 75 on either of the measures were classified as not having mental retardation.

For those sample members with scores between 71 and 75 on one or both measures or for whom either of the measures was missing, we reviewed records and employed a clinical consensus procedure to determine mental retardation status. This determination was conducted by three psychologists (one master's level and two PhDs), who reviewed each case file independently. Information in the file included the standardized measures (Wide Range Intelligence Test or Vineland, when available); parent report of prior diagnoses, intellectual functioning, and adaptive behavior; and clinical and school records, when available. Agreement among the three independent raters was reached on 77.8% of cases following the ini-

tial review. All cases in which there was a disagreement among the raters were discussed until consensus was reached as to whether the individual had mental retardation. For this study, a comorbid diagnosis of mental retardation was coded 1 and 0 indicated no mental retardation. Gender was coded 0 (male) or 1 (female), and child health was rated by mothers on a 4-point scale (1 = *poor* to 4 = *excellent*; $M = 3.30$, $SD = .65$).

Three measures of impairments and behaviors associated with autism were impairments in language and reciprocal social interaction and maladaptive behaviors. Impairments in language skills were represented by an item coded from the ADI-R describing the overall current level of language (0 = *uses 3-word phrases to communicate*; 1 = *uses primarily single words*; 2 = *no language*). A measure of impairment in reciprocal social interaction was also derived from the ADI-R using the sum of the ratings for 14 items measuring current qualitative impairment in reciprocal social interaction (direct gaze, social smiling, range of facial expression, interest in people, response to others' approaches, friendships, directing attention, offering to share, sharing enjoyment with others, use of other's body, offering comfort, quality of social overtures, inappropriate facial expressions, and appropriateness of social response). A coding of 0 on each of these items indicates no abnormality present; a score of 1, possible abnormality; 2, definite abnormality; and 3, extreme abnormality with respect to the behavior. Using suggestions from Lord et al. (1994), we combined scores of 3 and 2 before summing. Social impairment scores ranged from 1 to 27 ($M = 14.96$, $SD = 5.92$, $\alpha = .84$). The interviewers who administered the ADI-R had participated in an approved ADI-R training program. All interviews were taperecorded. Interrater reliability between the interviewers and two supervising psychologists experienced in the diagnosis of autism and the use of the ADI-R averaged 88%.

Maladaptive behaviors were measured with the Scales of Independent Behavior-Revised (Bruininks, Woodcock, Weatherman, & Hill, 1996). The problem behavior scale of this instrument consists of eight behavior problems: behavior that is hurtful to self (37% of the sample demonstrated this behavior), unusual or repetitive behaviors (82% of sample), or withdrawn or inattentive (68% of sample), socially offensive behavior (70% of sample), uncooperative behavior (51% of sample), behavior that is hurtful to others (34%

of sample), destructive to property (34% of sample), and disruptive behavior (53% of sample). The mother was asked whether her son or daughter had each of these eight behavior problems within the last 6 months and, if so, to rate the frequency (1 = *less than once a month* to 5 = *one or more times an hour*) and severity (1 = *not serious* to 5 = *extremely serious*) of the behavior. Standardized algorithms (Bruininks et al., 1996) were used to translate frequency and severity ratings into a general summary score, where higher scores indicated more severe maladaptive behaviors. Behavior problems scores ranged from 96 to 150 ($M = 108.96$, $SD = 10.27$). According to these scores, almost half of the sample had behavior problems in the "normal" range (48.5%), one third had behavior problems in the marginal range (31.2%), 11.9% had moderate behavior problems, 5.4% had serious behavior problems, and 3 individuals had very serious behavior problems (Bruininks et al., 1996). Bruininks et al. have previously documented the reliability and the validity of their instrument.

Maternal characteristics examined were marital status, pessimism, and self-esteem. Marital status was dichotomously coded as 0 (*not married*) or 1 (*married*). Maternal pessimism was measured with 10 items from the Pessimism scale of the Questionnaire on Resources and Stress-QRS-F (Friedrich, Greenberg, & Crnic, 1983), which was used to assess worries and pessimism about the future of their son or daughter. Mothers rated each item as 0 (*false*) or 1 (*true*), with resulting scores ranging from 0 to 10 ($M = 6.49$, $SD = 2.34$, $\alpha = .70$). Maternal self-esteem was measured using the Rosenberg Self-Esteem Scale (Rosenberg, 1965). Mothers rated 10 items on a 4-point scale from 1 (*strongly disagree*) to 4 (*strongly agree*). Scores ranged from 21 to 40 ($M = 32.73$, $SD = 4.11$, $\alpha = .87$).

Results

Mother-Child Relationship Quality

The first research question we examined was, how do mothers characterize the quality of their relationship with their son or daughter with autism in terms of positive affect, expressed emotion, and warmth? The sample had relatively normally distributed scores on the Positive Affect Index. Ratings of maternal positive affect toward the son or daughter ranged from 15 to 30 ($M = 23.70$, $SD = 3.54$), whereas ratings of positive affect per-

ceived from the son or daughter ranged from 5 to 30 ($M = 21.32$, $SD = 4.56$). Although the two variables were significantly correlated, $r = .676$, $p < .001$, mothers rated their own feelings of affect toward their son or daughter significantly more positively than they perceived from their son or daughter, $t = 9.98$, $p < .001$.

The highest ratings were observed for maternal levels of affection and respect for their son or daughter (see Table 1). A very large proportion of mothers felt that they had very much or extreme affection (90%) and respect (over 75%) for their son or daughter. Lower ratings were reported for how much the mother perceived that she was fair towards and understanding of her son or daughter, with just over 50% reporting very much or extreme fairness and understanding in the relationship. The lowest ratings were those regarding maternal trust of their son or daughter.

A different pattern was observed with respect to positive affect perceived by the mother from her son or daughter. Mothers gave the highest ratings for how much her son or daughter trusts them (see Table 1), with almost three quarters of the mothers reporting that her son or daughter trusts them *very much* or *extremely*. Similarly, almost two thirds of the mothers reported *very much* or *extreme* affection from her son or daughter. However, considerably fewer of the mothers reported perceiving respect, fairness, and understanding from their son or daughter.

Table 1. Frequencies (in Percentages) for Ratings on Positive Affect Items ($N = 202$)

Items	Very much or extremely
Positive affect toward son/daughter	
Mother has affection for son/daughter	90.1
Mother respects son/daughter	78.2
Mother is fair to son/daughter	57.9
Mother understands son/daughter	53.0
Mother trusts son/daughter	38.1
Positive affect from son/daughter	
Son/daughter has affection for mother	63.3
Son/daughter respects mother	39.6
Son/daughter is fair to mother	27.7
Son/daughter understands mother	29.2
Son/daughter trusts mother	74.3

Table 2. Correlations of Independent and Dependent Variables

	1	2	3	4	5	6	7
1. Age of son/daughter	—						
2. Mental retardation	.237***	—					
3. Gender of son/daughter (s/d)	.107	.080	—				
4. Health of s/d	-.052	-.082	-.002	—			
5. Language impairments	.118	.355***	-.065	-.034	—		
6. Social impairments	.184**	.388***	.025	-.126	.350***	—	
7. Maladaptive behaviors	.232***	.149*	.062	-.185**	-.031	-.238***	—
8. Maternal marital status	-.213**	-.128	-.011	.077	-.042	-.098	-.091
9. Maternal pessimism	-.010	.258***	-.073	-.180*	.135	.180*	.280***
10. Maternal self-esteem	-.002	.080	-.007	.009	.035	.061	-.180*
11. Positive affect toward s/d	.072	-.074	-.104	.167*	-.033	-.134	-.422***
12. Positive affect from s/d	.083	.038	.006	.224***	.076	-.121	-.449***
13. Criticism	-.131	.085	-.029	-.147*	.027	.111	.316***
14. Over-involvement	-.094	.034	.055	-.149*	.090	-.104	.015
15. Warmth	-.034	.005	-.079	.078	.027	-.102	-.233***
16. Caregiving strains	-.185**	.139*	.009	-.217**	.082	.139*	.650***
17. Caregiving gains	.200**	.071	-.099	.000	.121	.001	-.213**

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

These self-reported positive maternal feelings of affection for their son or daughter were consistent with the independent ratings of warmth based on the Five-Minute Speech Sample. Over a third (35.6%) of the mothers were rated as expressing moderately high to high degrees of warmth, half (50.5%) of the mothers were rated as expressing some to moderate degrees of warmth, and only 10.4% of the mothers were rated as expressing no or very little warmth in the relationship. The correlation between warmth and the mother’s self-report of positive affect toward or from her son or daughter with autism was .40, $p < .001$.

With respect to expressed emotion, 28.7% of mothers were rated as high in overall expressed emotion. Almost half of the mothers were categorized as low in criticism (49.5%), while 27.7% were categorized as borderline in criticism, and 19.3% were categorized as high in criticism. With respect to over-involvement, again almost half of the mothers (47.5%) were categorized as having low emotional over-involvement; 38.1%, borderline emotional over-involvement; and 10.9%, high.

As shown in Table 2, bivariate correlations indicate that high levels of criticism were related to lower levels of positive affect toward the son or daughter with autism, lower levels of positive

affect received from the child, and lower levels of warmth. In contrast, emotional over-involvement was not related to either measure of positive affect but was related to warmth.

Prediction of Mother-Child Relationship Quality

In our second research question, our aim was to determine the factors predictive of positive affect, criticism, emotional over-involvement, and warmth in the mother-child relationship. As shown in Table 2, in general, mother-child relationships were of better quality when the child had good health and less severe maladaptive behaviors and when the mother had low levels of pessimism and high self-esteem.

As shown in Table 3, an ordinary least squares regression model for the prediction of positive affect toward the son or daughter was significant and accounted for 27.7% of the variance in the dependent variable, $F(10, 195) = 7.09, p < .001$. Less severe maladaptive behaviors in the son or daughter, lower levels of maternal pessimism, and greater maternal self-esteem were associated with higher levels of positive affect toward the son or daughter. The regression model for the prediction of positive affect from the son or daughter accounted for 30.8% of the variance, $F(10, 195) =$

Table 2. Extended

8	9	10	11	12	13	14	15	16	17
—									
.002	—								
-.062	-.210**	—							
.062	-.325***	.290***	—						
.096	-.262***	.286***	.676***	—					
-.078	.317***	-.149*	-.404***	-.315***	—				
.066	-.061	-.009	.084	.022	-.102	—			
.158*	-.259***	.174*	.403***	.399***	-.386***	.174*	—		
-.203**	.557***	-.398***	-.492***	-.506***	.395***	.016	-.337***	—	
-.018	-.242**	.356***	.318***	.229***	-.232***	.047	.286***	-.380***	—

8.23, $p < .001$. The significant predictors were the same as those for positive affect toward the son or daughter, with the additions of better health and mental retardation (trend-level) in the son or daughter associated with greater positive affect.

Table 3 also reports the predictors of criticism, emotional over-involvement, and warmth. The regression model for the prediction of criticism accounted for 17.8% of the variance, $F(10, 190) = 3.89$, $p < .001$. More severe maladaptive behav-

Table 3. Prediction of Mother-Child Relationship Variables

Variable	Positive affect toward son/daughter	Positive affect from son/daughter	Maternal criticism	Maternal over-involvement	Maternal warmth
Child background characteristics					
Age of s/d ^a	.039	.013	-.129	-.114	-.040
Mental retardation	.036	.135†	.012	.089	.118
Gender of adolescent	-.100	.002	-.018	.072	-.078
Health of s/d	.071	.127*	-.066	-.175*	.003
Behavioral characteristics of s/d					
Language impairments	-.035	.093	-.024	.165*	.050
Social impairments	-.027	-.091	.040	-.175*	-.070
Maladaptive behaviors	-.285***	-.326***	.162*	.008	-.136
Maternal characteristics					
Marital status	.053	.083	-.086	.062	.157*
Pessimism	-.210**	-.158*	.235**	-.105	-.226**
Self-esteem	.195**	.190**	-.074	-.032	.089
R^2	.277***	.308***	.178***	.091†	.145**

^aSon/daughter.

* $p < .05$. ** $p < .01$. *** $p < .001$. † $p < .07$.

iors in the son or daughter and higher levels of maternal pessimism predicted higher levels of maternal criticism. The regression model for the prediction of over-involvement accounted for less than 10% of the variance and approached significance, $F(10, 90) = 1.79, p = .064$. Greater maternal emotional over-involvement was predicted by poorer health in the son or daughter and more severe language impairment, but by less severe social impairment. Finally, the variables accounted for 14.5% of the variance in maternal warmth, $F(10, 190) = 3.06, p < .001$. Greater warmth was observed when the mother was married and reported less pessimism.

Prediction of Caregiving Strains and Gains

For the third research question, we examined the association between the quality of the mother-child relationship (as measured by positive affect toward the child, positive affect from the child, criticism, emotional over-involvement, and warmth) and two aspects of the mother's caregiving experience: caregiving strains and caregiving gains. To examine these associations, we included the five measures of relationship quality as independent variables in separate regression analyses predicting caregiving strains and gains. Additional predictors included child characteristics (age, mental retardation, gender, health), behavioral characteristics of the son or daughter (language impairments, social impairments, maladaptive behaviors) and maternal characteristics (marital status, pessimism, and self-esteem). These results are presented in Table 4.

Overall, the independent variables accounted for almost 70% of the variance in caregiving strains across the different regression models (see Table 4). Both positive affect variables significantly predicted caregiving strains, with lower levels of positive affect toward and from the son or daughter associated with more caregiving strain (see Models A and B). Maternal warmth predicted caregiving strains at the trend level (see Model E). Lower levels of maternal warmth were associated with greater caregiving strain. Maternal criticism and emotional over-involvement did not predict caregiving strains in our regression analysis, although criticism was significantly correlated with strains, as shown in Table 2.

Caregiving strains were also predicted by characteristics of the son or daughter with autism and with maternal characteristics. Having an older son or daughter with fewer maladaptive behaviors was

associated with lower caregiving strain in all models. Among the maternal characteristics, being married, having lower pessimism, and higher self-esteem were associated with lower levels of caregiving strain across all models.

In comparison, the set of predictors of caregiving gains accounted for only about 25% of the variance in this dependent variable across the regression equations (see Table 4). Positive affect toward the son or daughter and maternal warmth were significant predictors of greater caregiving gains (see Models A and E). As in the regression analysis for caregiving strains, criticism was not a significant predictor even though the bivariate correlation was significant. Similar to the prediction of caregiving strains, having an older child with autism was associated with greater caregiving gains. Also, having a son was predictive of greater gains at the trend level. Moreover, lower maternal pessimism and higher maternal self-esteem predicted greater caregiving gains.

Discussion

The findings from the present study add to the literature on families of individuals with autism spectrum disorders in several ways. This study provides information about the heterogeneity in the quality of mother-child relationships during adolescence and adulthood, identifies factors that are associated with a better quality relationship during these life stages, and describes the manner by which the mother-child relationship contributes to the mother's caregiving experience (both strains and gains). There are several noteworthy findings. First, the mothers had relatively positive relationships with their son or daughter, as measured by their report of positive affect and by independent ratings of their expressed emotion and warmth. Contrary to historic characterizations of mothers of individuals with autism (Betelheim, 1967), only 10% of the mothers in this sample were rated low on warmth, and 90% reported high levels of affection for their child. These convergent patterns from independent measures of the mother-child relationship yield new insights about the calibration of this primary relationship across the life course in individuals with autism.

Second, mothers felt significantly more positive affect toward their son or daughter than they perceived to be reciprocated by the son or daughter. These findings both dispel and support some

Table 4. Prediction of Maternal Caregiving Strains and Gains

Variable	Model A	Model B	Model C	Model D	Model E
Strains					
Child background characteristics					
Age of son/daughter (s/d)	-.113*	-.115*	-.104*	-.144*	-.117*
Mental retardation	-.004	.012	-.010	-.009	.001
Gender of adolescent	.012	.023	.023	.021	.015
Health of s/d ^a	-.051	-.040	-.053	-.057	-.058
Behavioral characteristics					
Language impairments	.084	.101*	.082	.080	.085
Social impairments	-.062	-.073	-.063	-.059	-.066
Maladaptive behaviors	.427***	.409***	.443***	.456***	.444***
Maternal characteristics					
Marital status	-.200***	-.194***	-.200***	-.208***	-.194***
Pessimism	.347***	.346***	.346***	.366***	.346***
Self-esteem	-.229***	-.222***	-.244***	-.249***	-.242***
Mother–child relationship					
Positive affect toward s/d	-.105*				
Positive affect from s/d		-.147**			
Maternal criticism			.082		
Maternal over-involvement				.005	
Maternal warmth					-.085†
<i>R</i> ²	.688***	.695***	.690***	.684***	.690***
<i>F</i>	36.95***	38.16***	36.15***	35.25***	36.27***
Gains					
Child characteristics					
Age of s/d	.193**	.198**	.191*	.207**	.209**
Mental retardation	.019	.018	.039	.035	.019
Gender of adolescent	-.101	-.118	-.124†	-.125†	-.108
Health of s/d	-.054	-.048	-.049	-.036	-.042
Behavioral characteristics					
Language impairments	.121	.111	.089	.085	.082
Social impairments	-.052	-.051	-.044	-.042	-.034
Maladaptive behaviors	.007	-.025	-.024	-.040	-.017
Maternal characteristics					
Marital status	.044	.049	.051	.057	.033
Pessimism	-.175*	-.202**	-.189*	-.208**	-.174*
Self-esteem	.262***	.285***	.284***	.292***	.275***
Mother–child relationship					
Positive affect toward s/d	.166*				
Positive affect from s/d		.049			
Criticism			-.096		
Overinvolvement				.037	
Warmth					.167*
<i>R</i> ²	.246***	.227***	.229***	.223***	.245***
<i>F</i>	5.42***	4.89***	4.82***	4.64***	5.26***

Note. Standardized betas presented.

p* < .05. *p* < .01. ****p* < .001. †*p* < .07.

common notions about autism. The fact that ratings of affection were high contrasts with the public perception and earlier reports (e.g., Rutter, 1978; Volkmar, 1987) of individuals with autism as lacking in affection for their mothers. Nevertheless, the social impairment that defines autism may be the reason why positive affect was not perceived by the mother to be fully reciprocated by the son or daughter. Furthermore, the relatively lesser extent to which the son or daughter was perceived to respect and understand the mother likely also reflects the fact that individuals with autism have impairments in cognitive, communication, and social relationships, and oftentimes questionable social and practical judgment. In addition, the striking discrepancy between the trust scores expressed by mothers and attributed to the son or daughter (38% vs. 74%, respectively, were rated high on trust) is further evidence of the persistent inequality of the relationship through adolescence and adulthood, as mothers reported that their son or daughter trusted them a great deal, whereas they felt considerably less trusting of their son or daughter.

The ratings of expressed emotion and warmth in the mothers essentially echoed their ratings of positive affect. In general, fewer than 30% of the mothers were rated as high in expressed emotion. Mothers expressed moderate to high levels of warmth and relatively low levels of criticism and over-involvement. As compared with past reports of expressed emotion in mothers of individuals with developmental disabilities, the rates of overall expressed emotion in mothers in our sample were comparable to those reported by Dossetor et al. (1994), yet considerably lower than those reported by Beck et al. (2004). The significant associations between positive affect and expressed emotion in our sample support the validity of using these measures of relationship quality; higher levels of positive affect reported by the mother were associated with greater ratings of warmth and lower levels of criticism. These dimensions of the mother-child relationship were predicted by similar, yet not completely overlapping, characteristics of the son or daughter and the mother. Maladaptive behaviors in the son or daughter and maternal pessimism were the most consistent predictors, with lower levels of maladaptive behaviors and less maternal pessimism associated with greater positive affect, lower levels of criticism, and higher levels of warmth.

Regarding the prediction of caregiving strains

and gains, we found that the quality of the mother-child relationship was indeed an important factor, even after controlling for many maternal and child characteristics. Mothers had lower levels of caregiving strains and higher levels of caregiving gains when they reported greater positive affect toward their son or daughter and were rated higher on warmth. The effect for criticism appeared to be weaker; it was significantly correlated with caregiving gains and strains on the bivariate level but was not a significant predictor in the regression analyses. These data suggest the importance of the quality of the mother-child relationship for maintaining maternal caregiving capacity in families of individuals with autism spectrum disorders.

Furthermore, we found that caregiving strains were influenced considerably by maladaptive behavior in the son or daughter, whereas caregiving gains were not. Notably, the mother's worries about her son or daughter's future and her own self-esteem were important predictors of both strains and gains. This varied pattern of predictors of caregiving strains and gains supports the notion that we need to consider separately both positive and negative aspects of caregiving, as has been suggested by earlier researchers (Greenberg et al., 1993; Lawton, Kleban, Moss, Rovine, & Glicksman, 1989). Moreover, our set of variables predicting caregiving strains accounted for a large percentage (70%) of the variance in this dependent variable, whereas considerably less variance was accounted for in caregiving gains (25%), again suggesting that these two dimensions are distinct empirically as well as conceptually.

We found that the quality of the mother-child relationship was stable over the age span of the present sample, as the age of the son or daughter was not associated with any measure of the mother-child relationship. This stability is divergent from patterns evident in the general population, where affective closeness increases as children move from adolescence to young adulthood (Aquilino, 1997; Rossi & Rossi, 1990). In the general population, the increasing similarity of life experiences strengthens the parent-child relationship and promotes a shift to increased maturity and reciprocity in the relationship (Aquilino, 1997; Nydegger, 1991). A developmental disability such as autism affects the life course of the individual to the extent that typical adulthood roles, such as full-time employment, marriage, and parenthood, are less likely and may never occur. Moreover, the adults in this sample continued to

live within the parental home, which is atypical for the general population, and this too may account for the stability of positive affect in the relationship through adolescence and adulthood.

With respect to child characteristics, it is interesting that more significant health and language limitations in the son or daughter were associated with greater maternal over-involvement. High expressed emotion, as measured by criticism and over-involvement, has generally been viewed as related to enduring personality traits of the caregiver (Hooley & Hiller, 2000). However, in this sample, over-involvement seemed to be the result of having to care for a son or daughter who had greater health limitations and who had more difficulty communicating his or her needs. Although the additional finding that *less* severe social impairments are associated with higher levels of over-involvement might at first seem contradictory, it is possible that when children have better social reciprocity skills, mothers are more able to remain engaged and vigilant, despite the child's health problems and language impairments. This finding points to the likelihood of bidirectional effects of the mother–child relationship and warrants attention in future research.

The finding that more severe maladaptive behaviors in the son or daughter were associated with less positive affect in the mother–child relationship, greater criticism, and greater caregiving strains was not surprising, as this has been found in other research with individuals who have developmental or psychiatric disabilities (e.g., Essex, 2002; Greenberg et al., 1993; Pruchno et al., 1996). The behavior problems measured in this study, however, are not ones that are unique to autism but, rather, are characteristic of developmental disabilities in general. The symptoms of autism per se (impaired communication and impaired social reciprocity) were not found in our multivariate analyses to be associated with positive affect in the mother–child relationship, criticism, or warmth. It is possible that by adolescence or adulthood, the mother has developed a relationship with her son or daughter that accommodates the symptoms of autism, whereas it may be more difficult to accommodate behavior problems, which are increasingly difficult to manage when the son or daughter is older and larger in size.

Maternal pessimism about the child's future was the most consistent maternal characteristic predictive of the mother–child relationship and

the mother's caregiving experience. In the past researchers have shown that worries about the future are very common in mothers of children with autism (e.g., Donenberg & Baker, 1993; Gray & Holden, 1992; Kasari & Sigman, 1997; Koegel et al., 1992). From this study, however, we cannot determine whether pessimism influences the mother–child relationship, or the reverse. It is also possible that another variable that we did not measure, such as a general optimistic outlook on life, accounts for the relationship between maternal characteristics and her caregiving experience.

There are several limitations to the current study. First, as noted, we cannot determine the direction of effects. Second, we included a one-item measure of child health, which may have questionable validity as compared with summary scores. However, research has shown that this one-item measure of health is a powerful and valid predictor of health outcomes, including mortality (Idler & Benyami, 1997). Third, we examined the mother–child relationship only from the perspective of the mother, not the child. However, ratings of expressed emotion and warmth were made by an independent rater, based on a speech sample of the mother talking about her son or daughter and how they got along together; standardized and well-validated codes were used.

Fourth, questions can be raised about the generalizability of our findings for several reasons. For example, we explored the mother–child relationship only in families where the son or daughter lived at home. It is possible that the positive findings in the current study reflect a subgroup of families wherein the mother has sufficient psychosocial resources and her son or daughter has relatively few interfering behaviors, which may be protective of the mother–child relationship and might also make coresidence possible. It is also possible that by restricting our sample to those with autism living at home, we selected a group of higher functioning individuals. Indeed, our sample had fewer individuals with reported mental retardation and a higher number of individuals with language than is reported in the *Diagnostic and Statistical Manual of Mental Disorder-text revision-DSM-IV* (American Psychiatric Association, 2000). In recent epidemiological studies, however, researchers have reported rates of mental retardation similar to those found in our study (Fombonne, 2003). Our sample is also limited by its ethnic and racial homogeneity, with less than 10% of the sample being from ethnic minority cultural

groups, thus reducing our generalizability to the larger population of families of adolescents and adults with autism.

To conclude, the quality of the mother-child relationship is of critical importance in our understanding of the impact of autism on the well-being of the family and the impact of the family on the development of individuals with autism. Historically, the etiology of autism was attributed to a lack of warmth in the mother and a poor quality relationship with her child. The empirical findings of the present study counter past clinical mythology because over 90% of the mothers were reported to have a warm relationship characterized by high levels of affection for their child. Furthermore, although the social impairment of autism has been considered by some to be the core characteristic of the disorder (Travis & Sigman, 1998) and although there is good evidence that this impairment persists throughout life (Seltzer et al., 2004), results of the present study suggest that the social impairment of autism may alter, but does not fundamentally impair, the mother-child relationship during adolescence and adulthood.

References

- American Psychiatric Association. (2000). *Diagnostic and statistical manual* (4th ed.-text revision.). Washington, DC: Author.
- Aquilino, W. S. (1997). From adolescent to young adult: A prospective study of parent child relations during the transition to adulthood. *Journal of Marriage and the Family*, *59*, 670-686.
- Beck, A., Daley, D., Hastings, R. P., & Stevenson, J. (2004). Mothers' expressed emotion towards children with and without intellectual disabilities. *Journal of Intellectual Disability Research*, *48*, 628-638.
- Bengtson, V. L., & Allen, K. R. (1993). The life course perspective applied to families over time In P. Boss, W. Doherty, R. LaRossa, W. Schumm, & S. Steinmetz (Eds.), *Sourcebook of family theories and methods: A contextual approach* (pp. 469-498). New York: Plenum Press.
- Bengtson, V. L., Olander, E. B., & Haddad, A. A. (1976). The "generation gap" and aging family members: Toward a conceptual model. In J. F. Gubrium (Ed.), *Time, roles, and self in old age* (pp. 237-263). New York: Human Sciences Press.
- Bengtson, V. L., & Roberts, R. E. L. (1991). Intergenerational solidarity in aging families: An example of formal theory construction. *Journal of Marriage and the Family*, *53*, 856-870.
- Bengtson, V. L., & Schrader, S. S. (1982). Parent-child relationships. In D. J. Mangon & W. A. Peterson (Eds.), *Research instruments in social gerontology* (Vol. 2, pp. 115-185). Minneapolis: University of Minnesota Press.
- Bertrando, P., Beltz, J., Bressi, C., Clerici, M., Farma, T., Invernizzi, G., & Cazzullo, C. L. (1992). Expressed emotion and schizophrenia in Italy: A study of an urban population. *British Journal of Psychiatry*, *161*, 223-229.
- Bettelheim, B. (1967). *The empty fortress: Infantile autism and the birth of the self*. New York: Free Press.
- Bristol, M. M., Gallagher, J. J., & Schopler, E. (1988). Mothers and fathers of young developmentally disabled and nondisabled boys: Adaptation and spousal support. *Developmental Psychology*, *24*, 441-451.
- Bristol, M. M., & Schopler, E. (1983). Stress and coping in families of autistic adolescents. In E. Schopler & G. B. Mesibov (Eds.), *Autism in adolescents and adults* (pp. 251-278). New York: Plenum Press.
- Brown, G. W., Birley, J. L. T., & Wing, J. K. (1972). Influence of family life on the course of schizophrenic disorders: A replication. *British Journal of Psychiatry*, *121*, 241-258.
- Bruininks, R. H., Woodcock, R. W., Weatherman, R. F., & Hill, B. K. (1996). *SIB-R. Scales of Independent Behavior-Revised*. Itasca, IL: Riverside.
- Capps, L., Sigman, M., & Mundy, P. (1994). Attachment security in children with autism. *Development and Psychopathology*, *6*, 249-261.
- Chen, F., & Greenberg, J. S. (2004). A positive aspect of caregiving: The influence of social support on caregiving gains for family members of relatives with schizophrenia. *Community Mental Health Journal*, *40*, 423-435.
- Dawson, G., Hill, D., Spencer, A., Galpert, L., & Watson, L. (1990). Affective exchanges between young autistic children and their mothers. *Journal of Abnormal Child Psychology*, *18*, 335-345.
- Demo, D. H., Small, S. A., & Savin-Williams, R. C. (1987). Family relations and self-esteem of

- adolescents and their parents. *Journal of Marriage and the Family*, 49, 705-715.
- Dissanayake, C., & Crossley, S. A. (1996). Proximity and sociable behaviours in autism: Evidence for attachment. *Journal of Child Psychology and Psychiatry*, 37, 149-156.
- Donenberg, G., & Baker, B. L. (1993). The impact of young children with externalizing behaviors on their families. *Journal of Abnormal Child Psychology*, 21, 179-198.
- Dosseter, D. R., Nicol, A. R., Stretch, D. D., & Rajkhowa, S. J. (1994). A study of expressed emotion in the parental primary carers of adolescents with intellectual impairment. *Journal of Intellectual Disability Research*, 38, 487-499.
- Essex, E. L. (2002). Mothers and fathers of adults with mental retardation: Feelings of intergenerational closeness. *Family Relations*, 51, 156-165.
- Fombonne, E. (2003). Epidemiological surveys of autism and other pervasive developmental disorders: An update. *Journal of Autism and Developmental Disorders*, 33, 365-382.
- Friedrich, W. N., Greenberg, M. T., & Crnic, K. (1983). A short-form of the Questionnaire on Resources and Stress. *American Journal of Mental Deficiency*, 88, 41-48.
- Glutting, J., Adams, W., & Sheslow, D. (2000). *Wide Range Intelligence Test*. Wilmington, DE: Wide Range.
- Grant, G. (1986). Older carers, independence, and the care of mentally handicapped adults. *Ageing and Society*, 6, 333-351.
- Gray, D. E., & Holden, W. J. (1992). Psycho-social well-being among the parents of children with autism. *Australian and New Zealand Journal of Developmental Disabilities*, 18, 83-93.
- Greedharry, D. (1987). Expressed emotion in the families of the mentally handicapped: A pilot study. *British Journal of Psychiatry*, 150, 400-402.
- Greenberg, J. S. (1995). The other side of caring: Adult children with mental illness as supports to their mothers in later life. *Social Work*, 40, 414-423.
- Greenberg, J. S., Seltzer, M. M., & Greenley, J. R. (1993). Aging parents of adults with disabilities: The gratifications and frustrations of later-life caregiving. *The Gerontologist*, 33, 542-550.
- Greenberg, J. S., Seltzer, M. M., Krauss, M. W., Chou, R. J., & Hong, J. (2004). The effect of quality of the relationship between mothers and adult children with disabilities: The mediating role of optimism. *American Journal of Orthopsychiatry*, 74, 14-25.
- Hauser-Cram, P., & Krauss, M. W. (2004). Adolescents with developmental disabilities and their families. In R. M. Lerner & L. Steinberg (Eds.), *Handbook of adolescent psychology* (pp. 697-719). New York: Wiley.
- Heller, T., Hsieh, K., & Rowitz, L. (1997). Maternal and paternal caregiving of persons with mental retardation across the lifespan. *Family Relations*, 46, 407-415.
- Hooley, J. M., & Hiller, J. B. (2000). Personality and expressed emotion. *Journal of Abnormal Psychology*, 109, 40-44.
- Howlin, P., Mawhood, L., & Rutter, M. (2000). Autism and developmental receptive language disorder—A follow-up comparison in early adult life. II: Social, behavioral, and psychiatric outcomes. *Journal of Child Psychology and Psychiatry and Allied Disciplines*, 41, 561-578.
- Idler, E. L., & Benyami, Y. (1997). Self-rated health and mortality: A review of twenty-seven community studies. *Journal of Health and Social Behavior*, 38, 21-37.
- Ivanovic, M., Vuletic, Z., & Bebbington, P. (1994). Expressed emotion in the families of patients with schizophrenia and its influence on the course of illness. *Social Psychiatry and Psychiatric Epidemiology*, 29, 61-65.
- Joseph, R. M., & Tager-Flusberg, H. (1997). An investigation of attention and affect in children with autism and Down syndrome. *Journal of Autism and Developmental Disorders*, 27, 385-396.
- Kasari, C., & Sigman, M. (1997). Linking parental perceptions to interactions in young children with autism. *Journal of Autism and Developmental Disorders*, 27, 39-57.
- Koegel, R. L., Schreibman, L., Loos, L. M., Dirlich-Wilhelm, H., Dunlap, G., Robbins, F. R., & Plien, A. J. (1992). Consistent stress profiles in mothers of children with autism. *Journal of Autism and Developmental Disorders*, 22, 205-216.
- Lawton, M. P., Kleban, M. H., Moss, M., Rovine, M., & Glicksman, A. (1989). Measuring caregiving appraisal. *Journal of Gerontology: Psychological Sciences*, 44, P61-71.
- Li, L. W., & Seltzer, M. M. (2005). Relationship quality with parent, daughter role salience, and self-esteem of daughter caregivers. *Marriage and Family Review*, 37, 63-82.

- Lord, C., Rutter, M., & Le Couteur, A. (1994). Autism Diagnostic Interview-Revised: A revised version of a diagnostic interview for caregivers of individuals with possible pervasive developmental disorders. *Journal of Autism and Developmental Disorders, 24*, 659-685.
- Luckasson, R., Borthwick-Duffy, S., Buntinx, W. H. E., Coulter, D. L., Craig, E. M., Reeve, A., Schalock, R. L., Snell, M. E., Spitalnik, D. M., Spreat, S., & Tassé, M. J. (2002). *Mental retardation: Definition, classification, and systems of supports* (10th ed.). Washington, DC: American Association on Mental Retardation.
- Luescher, K., & Pillemer, K. (1998). Intergenerational ambivalence: A new approach to the study of parent-child relations in later life. *Journal of Marriage and the Family, 60*, 413-425.
- Magaña, A. B., Goldstein, M. J., Karno, M., Miklowitz, D. J., Jenkins, J., & Falloon, I. R. H. (1986). A brief method for assessing expressed emotion in relatives of psychiatric patients. *Psychiatry Research, 17*, 203-212.
- Nydegger, C. N. (1991). The development of paternal and filial maturity. In K. A. Pillemer & K. McCartney (Eds.), *Parent-child relations throughout life* (pp. 93-112). Hillsdale, NJ: Erlbaum.
- Orsmond, G. I., Seltzer, M. M., & Krauss, M. W. (2003). Behavior problems in adults with mental retardation and maternal distress: Examination of the direction of effects. *American Journal on Mental Retardation, 108*, 257-271.
- Pearlin, L. I. (1988). *Caregiver's stress and coping study* (NIMH R01 MH42122). San Francisco: University of California, Human Development and Aging Programs.
- Peris, T. S., & Baker, B. L. (2000). Applications of the expressed emotion construct to young children with externalizing behavior: Stability and prediction over time. *Journal of Child Psychology and Psychiatry, 41*, 457-462.
- Pruchno, R. A. (2003). Enmeshed lives: Adult children with developmental disabilities and their aging mothers. *Psychology and Aging, 18*, 851-857.
- Pruchno, R. A., Patrick, J. H., & Burant, C. J. (1996). Mental health of aging women with children who are chronically disabled: Examination of a two-factor model. *Journal of Gerontology: Social Sciences, 51B*, S284-S296.
- Rosenberg, M. (1965). *Society and the adolescent self image*. Princeton, NJ: Princeton University Press.
- Rossi, A. S., & Rossi, P. H. (1990). *Of human bonding: Parent-child relations across the life course*. New York: de Gruyter.
- Rutgers, A. H., Bakermans-Kranenburg, M. J., van Ijzendoorn, M. H., & van Berckelaer-Onnes, I. A. (2004). Autism and attachment: A meta-analytic review. *Journal of Child Psychology and Psychiatry, 45*, 1123-1134.
- Rutter, M. (1978). Diagnosis and definitions of childhood autism. *Journal of Autism and Childhood Schizophrenia, 8*, 139-161.
- Seltzer, M. M., & Krauss, M. W. (2001). Quality of life of adults with mental retardation/developmental disabilities who live with the family. *Mental Retardation and Developmental Disabilities Research Reviews, 7*, 105-114.
- Seltzer, M. M., Krauss, M. W., Shattuck, P., Orsmond, G. I., Swe, A., & Lord, C. (2003). Changes in the symptoms of autism in adolescence and adulthood. *Journal of Autism and Developmental Disorders, 33*, 565-581.
- Seltzer, M. M., Shattuck, P., Abbeduto, L., & Greenberg, J. S. (2004). The trajectory of development in adolescents and adults with autism. *Mental Retardation and Developmental Disabilities Research Reviews, 10*, 234-247.
- Sparrow, S. S., Carter, A. S., & Cicchetti, D. V. (1993). *Vineland Screener: Overview, reliability, validity, administration, and scoring*. New Haven: Yale University Child Study Center.
- Steketee, G., van Noppen, B., Lam, J., & Shapiro, L. (1998). Expressed emotion in families and the treatment of obsessive compulsive disorder. *Psychotherapy in Practice, 4*, 73-91.
- Travis, L. L., & Sigman, M. (1998). Social deficits and interpersonal relationships in autism. *Mental Retardation and Developmental Disabilities Reviews, 4*, 65-72.
- Vaughn, C. E., & Leff, J. P. (1976a). The influence of family and social factors on the course of psychiatric illness. *British Journal of Psychiatry, 129*, 125-137.
- Vaughn, C. E., & Leff, J. P. (1976b). The measurement of expressed emotion in the families of psychiatric patients. *British Journal of Social and Clinical Psychology, 15*, 157-165.
- Volkmar, F. R. (1987). Diagnostic issues in the pervasive developmental disorders. *Journal of Child Psychology and Psychiatry and Allied Disciplines, 28*, 365-369.
- Weisman, A., Lopez, S. R., Karno, M., & Jenkins,

Erratum

- J. (1993). An attributional analysis of expressed emotion in Mexican-American families with schizophrenia. *Journal of Abnormal Psychology, 102*, 601-606.
- Zarit, S. H., Reever, K. E., & Bach-Peterson, J. (1980). Relatives of the impaired elderly: Correlates of feelings of burden. *The Gerontologist, 20*, 649-655.

Received 6/5/03, accepted 11/21/05.

Editor-in-charge: Frank Floyd

Support for this research was provided by the National Institute on Aging (R01 AG08768), the National Institute on Disability and Rehabilitation

Research via the Rehabilitation Research and Training Center on Aging with Developmental Disabilities at the University of Illinois-Chicago, the National Institute of Child Health and Human Development (P30 HD HD03352), and the Graduate School of the University of Wisconsin-Madison. We thank the families who participated in this research. An earlier version of this paper was presented at the 35th annual Gatlinburg Conference on Research and Theory in Intellectual and Developmental Disabilities, San Diego, March 2002. Requests for reprints should be sent to Gael Orsmond, Boston University, Sargent College of Health and Rehabilitation Sciences, 635 Commonwealth Ave., Boston, MA 02215. E-mail: gorsmond@bu.edu