

Maternal Self-Efficacy and Associated Parenting Cognitions Among Mothers of Children With Autism

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Feelings of competency in the parental role, termed parenting self-efficacy, have been associated with well-being and positive parenting outcomes. Given the unique stresses inherent in raising a child with autism, parents may find it challenging to maintain a positive sense of well-being and self-efficacy. Study aims were to investigate associations between maternal self-efficacy and parenting cognitions among mothers of children with autism. Mothers ($n = 170$) completed questionnaires on paper or via the Internet. In a hierarchical linear regression, depression, parenting stress, agency, and guilt each accounted for unique variance in maternal self-efficacy when controlling for time since diagnosis and the presence of a second child with a disability. Autism knowledge was not associated with parenting self-efficacy. Self-efficacy appears to be associated with well-being, agency, and feelings of guilt among mothers of children with autism. Parent- and family-based interventions designed to support parental well-being and focusing on parenting cognitions may enhance parenting self-efficacy.

Keywords: autism, maternal self-efficacy, parenting stress, depression, agency

More parents are raising children with a diagnosis of autism than ever before. Given that parenting a child with autism is uniquely challenging and can be extremely stressful (Dumas, Wolf, Fisman, & Culligan, 1991; Sanders & Morgan, 1997; Smith, Oliver, & Innocenti, 2001), understanding factors that contribute to parental well-being is of utmost importance. Furthermore, there are increasing efforts to involve parents of children with autism in interventions (Bailey et al., 1998; Dunlap, 1999; Huff, 1996; Shields, 2001). Such involvement might be enhanced by additional investigation of factors that contribute to parental well-being and feelings of parenting competence in this population.

In comparison to parents of typically developing children, parents raising children with disabilities experience more parenting stress (Smith et al., 2001) and have higher rates of depression (Dumas et al., 1991; Sharpley, Bitsika, & Efremidis, 1997). Even among parents raising children with disabilities, parents of children with autism report significantly higher levels of stress (Dumas et al., 1991; Sanders & Morgan, 1997) and are more likely to experience depression (Olsson & Hwang, 2001). The underlying cause of these findings may be that parenting stress is associated with the frequency and breadth of children's maladaptive behavior (Tomanik, Harris, & Hawkins, 2004), and children with autism often engage in atypical behaviors and have elevated sensory and

regulatory difficulties (Carter, Irwin, Skuban, Davis, & Briggs-Gowan, 2005).

Studies have revealed that parental stress and depression are negatively associated with parenting self-efficacy, or parents' perceived feelings of competence in the parenting role (Coleman & Karraker, 1998; Cutrona & Troutman, 1986; Jackson & Huang, 2000; Scheel & Rieckmann, 1998; Teti, O'Connell, & Reiner, 1996). Perceived self-efficacy also has been associated with well-being among mothers (Ozer, 1995; Sahu & Rath, 2003) and has been shown to mediate the effect of child behavior problems on mothers' anxiety and depression among mothers of children with autism (Hastings & Brown, 2002). A better understanding of parents' perceived parenting self-efficacy and associated beliefs, thoughts, and feelings about parenting a child with autism may lead to more supportive interventions that enhance parental well-being.

Parenting Cognitions

All parents develop and adapt cognitions that include thoughts, attitudes, and beliefs about their parenting role that are based upon their upbringing, parenting experiences, and interactions with particular children. Parents' expectations and beliefs about parenting begin before their child is born and are modified through interactions with their developing child. Because children with autism behave in ways that are atypical and difficult to predict, how parents interpret their children's behavior may play a strong role in parental experience. In a study of Latina mothers of children with developmental disabilities or mental retardation, mothers who attributed a high versus low degree of responsibility to their children when they exhibited problem behaviors were significantly more likely to report experiencing negative emotions such as anger or frustration and to report that they typically respond in aggressive or harsh ways (Chavira, Lopez, Blacher, & Shapiro, 2000).

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Hence, cognitions about developmental disabilities and parenting may affect how parents of children with autism interpret their children's maladaptive behavior and difficulty with social interactions, how they feel about their own parenting competency, and the degree of negative affect they experience in response to their children's behavior. Little is known about how cognitions among parents of children with autism may affect their parenting experience, and few assessment measures exist to investigate this area.

Parenting Self-Efficacy

One dimension of parenting cognitions that has received substantial empirical attention is parenting self-efficacy. Perceived parenting self-efficacy is defined as feelings of competence in the caretaking role. Maternal self-efficacy has been defined as a mother's judgment of how well she can function in a caregiving capacity and address specific tasks or challenges related to the parenting role (Teti et al., 1996). Self-efficacy can play a mediating role between thought and action by influencing behavioral persistence (Bandura, 1986). For example, parents are more likely to persist if they believe their efforts will be successful. Reciprocally, positive efficacy expectations are reinforced by the experience of success. Perceived self-efficacy to cope with demands of occupational and familial roles has been shown to buffer the negative effects of greater childcare responsibility on psychological well-being (Ozer, 1995). In addition, mothers of young children with a broad range of physical and intellectual disabilities reported more problems feeling competent in the maternal role when compared with mothers of children without disabilities (Beckman, 1991). Given the unique stresses and challenges inherent in parenting a child with autism, maintaining a positive sense of parenting self-efficacy may be extremely challenging.

Maternal Agency

Maternal agency is the extent to which a mother assumes an active role in her child's development, engages in interactions with her child, and persists in identifying strategies that minimize maladaptive child behaviors and maximize adaptive behaviors. Mothers who assume an active role in promoting their children's development may also have a higher sense of perceived maternal self-efficacy. Conceptually, agency is distinct from maternal self-efficacy. For example, a mother who has a high sense of agency may be very active in playing with her child and working with an early intervention team to promote her child's development, but she may concurrently experience a low sense of maternal self-efficacy if she believes that she is not able to soothe or understand her child, or if she believes that her efforts are not aiding her child's developmental progress.

Maternal Guilt

When mothers are given the diagnosis of autism for their children, they often experience a combination of grief, shock, confusion, fear, worry, isolation, anger, numbness, sadness, and/or overwhelm and may wonder if they somehow inadvertently contributed to their child's atypical developmental pattern (Siegel, 1997; Sullivan, 1997). In contrast, some parents who have been seeking help or answers may feel relief and/or validation when they finally

receive a diagnosis. For many parents, receiving the diagnosis is an intense and emotional experience. Indeed, at a 7-year follow-up visit, parents of children with intellectual disabilities reported that receiving the child's diagnosis was the most stress-inducing life event related to raising a child with a disability (Baxter, Cummins, & Polak, 1995). Yet, parental emotional and cognitive responses to a diagnosis of autism are rarely addressed by health professionals.

Too often parents are not aided in the difficult process of coming to terms with their child's diagnosis. The psychological legacy in which mothers were blamed for their children's autism disorder (e.g., Bettelheim, 1967) lingers and may contribute to the social stigma some mothers feel. Although there is widespread acknowledgment of the challenges and stress that families face when a child is newly diagnosed with autism (National Research Council, 2001), little is known about whether parents feel guilty about their parenting. Unrecognized, unprocessed, and unaddressed feelings of guilt related to parenting may interfere with feelings of competence in the parenting role.

Autism Knowledge

Knowledge of the core deficits in autism (i.e., communication, social relating), characteristic stereotypes, etiology of autism, and effective intervention methods may also facilitate feelings of maternal self-efficacy. Discussing typical development, Fonagy, Steele, Steele, and Moran (1991) refer to a positive capacity of "reflective functioning," in which parents are able to make sense of their children's actions and behavior by inferring their children's underlying wishes and beliefs. It is conceivable that parents of children with autism may face extra challenges in developing this "reflective functioning" capacity because their children's responses to specific stimuli are often atypical and hence difficult to interpret. In addition, their affected children's developmental course may be significantly less predictable than that of typically developing children. In a recent study, mothers of children with autism reported more difficulty understanding their children's behaviors than mothers of typically developing children (Tunali & Power, 2002). Factual knowledge about autism may aid parents in attributing their children's impaired behavior to the disorder rather than to their parenting. Thus, having greater autism knowledge may promote feelings of parenting self-efficacy.

Study Purpose

The aim of this study was to explore associations between parenting self-efficacy and other parenting cognitions among mothers of children with autism (see Figure 1). Because no measures exist to assess parenting cognitions of agency, feelings of guilt, and autism knowledge in this population, questionnaires were rationally derived and the internal reliability of these questionnaires is reported. It was hypothesized that (1) agency and autism knowledge would be positively correlated with maternal self-efficacy and (2) guilt, maternal depression, and parenting stress would be negatively correlated with maternal self-efficacy. It is further hypothesized that (3) agency, autism knowledge, and guilt would account for unique variance in maternal self-efficacy over and above maternal depression and parenting stress. Depression and parenting stress are two aspects of maternal experience that have been extensively researched among diverse parent sam-

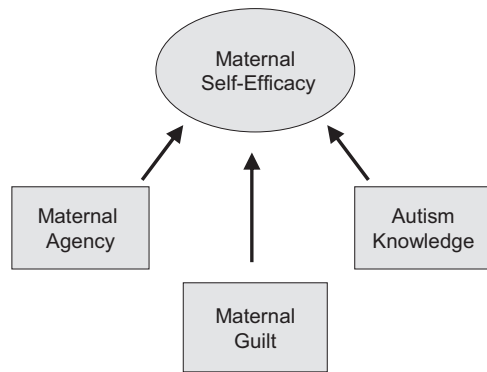


Figure 1. Hypothesized model of associations between maternal self-efficacy and parenting cognitions.

ples and for which empirically validated research measures exist. Because of the high rates of depressive symptoms (Dumas et al., 1991; Olsson & Hwang, 2001; Sharpley et al., 1997) and parenting stress (Dumas et al., 1991; Sanders & Morgan, 1997; Smith et al., 2001) among parents of children with autism, measures of these constructs are included as covariates in associations between maternal self-efficacy and agency, guilt and autism knowledge. If these associations between maternal self-efficacy and parenting cognitions are found, it would suggest that the newly derived measures have additive value in that they account for unique variance predicting to maternal self-efficacy beyond the empirically validated parenting stress and depression measures.

Methods

Participants

One hundred-seventy biological mothers of children with autism participated in this study. The children ranged from 2.4 to 10.8 years of age ($M = 6.5$). The sample had the expected child gender representation with regard to autism (87% male). Mothers reported their children as having a range of diagnoses on the autism spectrum (55% autism, 14% Asperger syndrome, 11% pervasive developmental disorder, 37% pervasive developmental disorder—not otherwise specified). Twenty-five mothers reported receiving more than one autism spectrum diagnosis, and the majority (55%) reported a diagnosis of autism. Mothers' mean age was 37 years. The average education level attained by participants was a college degree, and the average annual household income was approximately \$60,000. Ninety-one percent of participants lived in two-parent households. Twelve percent of participants identified as members of ethnic minority groups. Forty-three mothers (15%) reported that they had more than one child with a disability. Specifically, 34 reported having 2 children with a disability, 7 reported having 3 children with a disability, and 2 reported having 4 children with a disability. The sample is biased toward high socioeconomic status: Overall, mothers had advanced education, high income, and were part of two-parent households. Data from 16 mothers who reported comorbid diagnoses of attention deficit hyperactivity disorder, aphasia, apraxia, dyspraxia, generalized anxiety disorder, hyperlexia, mental retardation, obsessive-compulsive disorder, and/or seizure disorder were included in analyses, whereas data from one mother who reported a comorbid child diagnosis of Down syndrome were excluded from analyses.

Procedures

Mothers completed a set of questionnaires that included measures of (a) parenting self-efficacy (Teti & Gelfand, 1991), (b) maternal agency (de-

veloped for this study), (c) maternal guilt (developed for this study), (d) maternal autism knowledge (developed for this study), (e) depression (Center for Epidemiologic Studies Depression Inventory [CES-D] scale; Radloff, 1977), (f) parenting stress (Abidin, 1990), and (g) sociodemographic information. The questionnaire packet required approximately 30 minutes to complete and was completed online through an Internet interface ($n = 117$) or on paper ($n = 53$).

Included are data from 29 mothers of children with autism who were recruited for focus groups to examine the acceptability of specific questions on the rationally derived scales. They were recruited via support groups for parents of children with autism. Children in this subsample ranged in age from 2 to 8 years old. The focus group participants received \$20 for their participation. Overall, feedback about the rationally derived new instruments was positive. Focus group mothers described myths about autism of which they were aware and suggested two true/false questions that were added to autism knowledge questionnaire: (1) "It is impossible for children with autism to become potty trained," and (2) "If a child with autism is not talking by age 5, then s/he never will talk."

Nonfocus group mothers ($n = 141$) were recruited through a variety of sources including (1) an early intervention service provider, (2) local area support groups for parents of children with autism; (3) online postings on autism-interest list serves, (4) an e-mail solicitation to the National Alliance for Autism Research (NAAR) database of parents, (5) a NAAR-sponsored fundraising event (during which questionnaire packets were distributed), and (6) web posting on the NAAR website.

Measures

Sociodemographic Information

Sociodemographic questionnaire. Parents were asked for sociodemographic information about their child (i.e., age, gender, ethnicity, and birth order), their other children (i.e., age, gender, and presence of disability), themselves (i.e., age, marital status, educational attainment, and employment status) and their household (i.e., household composition and income).

Maternal Cognitions

The maternal efficacy scale (Teti & Gelfand, 1991). The scale consists of 10 items that are rated on a 4-point scale (1 = *not good at all*, 2 = *not good enough*, 3 = *good enough*, and 4 = *very good*). The measure was developed to assess maternal perceived efficacy in several domains of childcare (e.g., understanding what the child wants, knowing what the child enjoys, soothing the child). The authors report a Cronbach's standardized item α of 0.79 for the scale. Negative correlations between scores of maternal efficacy on this instrument and the Parental Stress Index Sense of Competence scale ($r = -0.75$, $p < .001$) provide evidence for reliability and concurrent validity of the Maternal Efficacy scale (Teti & Gelfand, 1991).

Maternal agency questionnaire. This questionnaire (newly developed, please see Appendix for items) is rationally derived and is composed of 20 questions about how often the mother engages in certain activities related to promoting her child's development. For each question, there are five possible responses indicating varying frequencies: (1) *never*, (2) *seldom*, (3) *sometimes*, (4) *often*, and (5) *almost always*. Questions include "How often do you . . . (1) Read books or articles on autism? (2) Show your child affection? (3) Communicate with other parents of children with autism? (4) Teach your child social skills?" A sum is calculated across the 20 questions to yield a total score.

Maternal guilt questionnaire. The first component of this questionnaire (newly developed, please see Appendix for items) asks mothers whether they ever feel responsible or guilty because they believe they are not doing as much for their child with autism as they think they should be doing. If a mother indicates that she does have these feelings, she is asked to fill out the remaining items about the frequency with which the feelings

occur, respond yes or no to whether these feelings arise in certain situations, describe other situations in which these feelings arise, and respond yes or no in regards to whether she believes that these feelings ever interfere with her ability to effectively parent her child. A guilt frequency scale is used such that mothers who report never having feelings of guilt are assigned a score of 1. Mothers who endorse feelings of guilt are assigned a score based on the frequency of guilt experienced (2 = *less than monthly*, 3 = *monthly*, 4 = *weekly*, 5 = *everyday or almost everyday*).

Maternal autism knowledge questionnaire. This questionnaire (newly developed) is rationally derived and composed of 43 true/false questions regarding facts about autism in the areas of diagnosis, symptoms, treatments and interventions, and etiology. Mothers had the option of responding, "don't know." With permission from NAAR, the first 10 questions were taken directly from NAAR's national poll. Two questions were added after the focus groups and were based on focus group mothers' suggestions. An autism knowledge score is calculated based upon the percent of correctly answered questions.

Center for Epidemiologic Studies Depression Scale (CES-D). The CES-D (Radloff, 1977) is one of the most widely used measures to assess depressive symptoms of adults (Gatz & Hurwicz, 1990). It consists of 20 symptom items, each rated on a 4-point scale based on the frequency with which the item has been experienced in the previous week. A score of 16 or higher signifies the risk of clinical depression. It has high internal consistency (Gatz & Hurwicz, 1990) and modest test-retest reliability for 2- to 4-week intervals (Radloff, 1977). The CES-D has been shown to discriminate between psychiatric inpatient and general population samples and to correlate with other self-report measures of depression (Radloff, 1977).

Parenting stress inventory-short form (PSI-SF). The PSI-SF (Abidin, 1990) is composed of 36 items that measure perceived stress in the parenting role. This measure is comprised of three domains: Difficult Child, Parent-Child Dysfunctional Interaction, and Parent Distress. These scales have shown excellent internal consistency and good test-retest reliability (Abidin, 1990).

Data Analytic Plan

For all questionnaires except the guilt questionnaire (frequency of guilt was based on one question), data from mothers who responded to fewer than 80% of questions on an individual questionnaire were excluded from analyses involving that questionnaire.

To investigate the internal reliability of the psychometric properties of the new agency, guilt, and autism knowledge scales, the interitem reliability of each of the scales was assessed by calculating the standardized Cronbach's α for each measure.

Next, to investigate the construct validity of the new measures of agency, guilt, and autism knowledge, the significance of correlations between self-efficacy and (1) agency, (2) autism knowledge, (3) guilt, (4) maternal depression, and (5) parenting stress was examined. In addition, the correlations among the newly developed measures (agency, guilt, and autism knowledge) were examined to determine whether they represent different constructs. Low to moderate correlations were expected because the new measures were developed to assess related but presumably independent constructs.

Associations between study variables and possible covariates, including time elapsed since diagnosis, maternal depression, parental stress, maternal age, child age, child gender, birth order, and whether a sibling has a disability were also examined. To investigate the incremental validity of the new measures, a hierarchical linear regression was used in which factors of agency, guilt, and autism knowledge were regressed on maternal self-efficacy while controlling for relevant sociodemographic and diagnostic covariates, depression, and parenting stress.

Table 1
Descriptive Data for Measures (N = 170)

Measures	<i>M</i>	<i>SD</i>	Actual range	Potential range
Maternal Self-Efficacy	32	4.4	20–40	10–40
Agency	82	8.0	53–97	20–100
Guilt Frequency	3	1.6	1–5	1–5
Autism Knowledge	39	3.8	22–43	0–43
Depression (CES-D)	15	12.0	0–56	0–60
Parenting Stress (PSI)	95	23.1	42–143	36–180

Note. A high numerical score for each measure indicates a high level of the construct. CES-D = Center for Epidemiological Studies Depression Inventory. PSI = Parenting Stress Inventory.

Results

Psychometrics of New Measures: Agency, Guilt, and Autism Knowledge

Descriptive data for measures are presented in Table 1. Agency and autism knowledge measures had good interitem consistency (standardized $\alpha = .79, 0.79$, respectively). The design of the measure of guilt did not lend itself to an interitem analysis because the questions assessed the presence, frequency, and context of feelings of guilt. Seven percent of participants did not respond to the question about whether they ever felt guilt. Of the mothers who responded to the question, 80% percent reported feelings of guilt. Among mothers who reported guilty feelings, 21% percent responded "yes" when asked whether they thought that feeling guilty ever interfered with their ability to effectively parent their child.

All measures, except for Autism Knowledge, showed adequate range and variability. There was a ceiling effect for the Autism Knowledge measure that resulted in a restricted range of scores.

There was no statistically significant difference between mothers who completed questionnaires on the Internet versus those who completed questionnaires on paper on the following demographics and parenting cognitions: age of parent, education of parent, living with a partner, income, child age, time since diagnosis, agency, guilt, autism knowledge, depression, or parenting stress.

Bivariate Associations Among Maternal Self-Efficacy, Agency, Guilt, Autism Knowledge, Depression and Parenting Stress

Bivariate correlations among study variables are reported in Table 2. As hypothesized, parenting stress, depression, and guilt were negatively correlated with maternal self-efficacy. Also as expected, agency was positively correlated with maternal self-efficacy. All correlations between maternal self-efficacy and cognitions (except for autism knowledge) were of moderate strength and were statistically significant.

Among newly assessed cognitions, there was an expected statistically significant positive correlation between agency and autism knowledge indicating that mothers who had high autism knowledge reported assuming very active roles in promoting their child's development. There was also a statistically significant negative correlation between agency and guilt cognitions suggesting that mothers who had a high sense of agency experienced less frequent feelings of guilt. The

Table 2
Bivariate Correlations Among Study Variables (N = 170)^a

Measures	1	2	3	4	5	6
1. Maternal Self-Efficacy	—	0.42***	-0.38***	-0.01	-0.33***	-0.45***
2. Agency		—	-0.20*	0.21**	-0.10	-0.21**
3. Guilt Frequency			—	-0.14	0.32***	0.35***
4. Autism Knowledge				—	-0.01	0.12
5. Depression					—	0.54***
6. Parental Stress						—

^a Actual *N* for correlations ranged from 159 to 170 because of missing data.

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

magnitude of these correlations suggests that agency, autism knowledge, and guilt cognitions are separate constructs.

In addition, the odds ratio for exceeding the clinical cutpoint for depression given an elevated parenting stress score was 6.6:1 (with a 95% confidence interval of 3.0 to 14.9). In other words, mothers who reported clinical levels of parenting stress were 6.6 times more likely to meet criteria for depression than mothers who had subclinical levels of stress, $\chi^2(1) = 23.8, p < .001$. The effect size was moderate ($\phi = 0.39, p < .001$).

Bivariate Associations Among Maternal Self-Efficacy and Demographic Variables

The presence of another child with a disability was negatively correlated with self-efficacy ($r = -0.21, p < .01$) such that mothers who had another child with a disability in addition to the child with autism were likely to have lower maternal self-efficacy than mothers who did not have an additional child with a disability. Maternal self-efficacy was statistically correlated with the time elapsed since diagnosis ($r = .25, p < .01$) and with child age ($r = .23, p < .01$). In turn, time elapsed since diagnosis and child age were highly correlated ($r = .77, p < .01$), so only time since diagnosis was entered as a covariate. Autism knowledge was positively correlated with time since diagnosis ($r = .20, p < .01$), suggesting that mothers gain autism knowledge with increasing time since receiving a diagnosis. In examining the associations among covariates, the presence of another child with a disability was correlated to a statistically significant degree with parenting stress ($r = .16, p < .05$), but not with depression. Time elapsed since diagnosis was not significantly correlated with parenting stress or depression. Maternal age, child gender, and birth order of

the child were not significantly associated with maternal self-efficacy.

Hierarchical Regression Analysis of Variables Predicting to Maternal Self-Efficacy

To investigate the incremental validity of the agency and guilt measures predicting to maternal self-efficacy, a hierarchical regression analysis was conducted with the following covariates: presence of another child with a disability, time elapsed since diagnosis, depression, and parenting stress (see Table 3). Autism knowledge was not included in the regression because it did not significantly correlate with maternal self-efficacy. The steps of the regression predicting to the dependent variable maternal self-efficacy were as follows: (1) Presence of Another Child with a Disability, (2) Time Elapsed Since Diagnosis, (3) Depression, (4) Parenting Stress, (5) Agency, and (6) Guilt. In the final model, which accounted for 40% of the variance in maternal self-efficacy, time since diagnosis, the presence of another child with a disability, parenting stress, agency, and guilt all accounted for unique variance in predicting to self-efficacy (see Table 3 in which the R^2 change, the standardized regression coefficients upon entry, β ; and the standardized regression coefficients in the final model, β , are presented). Agency and guilt accounted for an additional 14% of the self-efficacy variance over and above what was explained by the covariates. The decrease in the standardized β upon entry and the standardized β in the final model for depression indicates that the covariates depression and parenting stress share substantial variance.

Table 3
Hierarchical Regression Analysis for Variables Predicting Maternal Self-Efficacy (N = 154)

Predictor	R^2 change	Standardized β upon entry	Standardized β final model
Step 1: Another child with a disability	0.03	-0.19*	-0.14*
Step 2: Time elapsed since diagnosis	0.06	0.23**	0.21***
Step 3: Depression	0.06	-0.24**	0
Step 4: Parenting stress	0.11	-0.41***	-0.29***
Step 5: Agency	0.12	0.36***	0.33***
Step 6: Guilt frequency	0.02	-0.17*	-0.17*

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

Discussion

Consistent with our hypothesized model of maternal cognitions and maternal self-efficacy (see Figure 1), agency and guilt were significantly associated maternal self-efficacy in expected directions. Thus, mothers who reported that they were more active in promoting their child's development reported higher levels of maternal self-efficacy. Conversely, mothers who reported more frequent feelings of guilt reported lower maternal self-efficacy. In addition, findings suggested that over and above the contributions of depression, parenting stress, time since diagnosis and the presence of another child with a disability, agency, and guilt contributed unique variance in the prediction of maternal self-efficacy. These findings also lend support to the distinct nature of these constructs. Thus, parenting cognitions about agency and guilt aid in our understanding of maternal self-efficacy among parents of children with autism. In contrast to our hypothesis, autism knowledge was not associated with maternal self-efficacy, likely because of a restricted range in the autism knowledge measure. The homogeneity of the sample with respect to socioeconomic status and computer sophistication likely contributed to a ceiling effect for the autism knowledge questionnaire. Of interest, autism knowledge was positively associated with time since diagnosis, indicating that some parents may be coping with the challenge of parenting a child with autism by seeking knowledge about the disorder.

In the absence of existing instruments to assess the role of parenting cognitions, the reliability and construct validity of the following three new, rationally derived measures of parenting cognitions were examined: (1) maternal agency (i.e., the extent to which a parent assumes an active role in her child's development), (2) maternal guilt (i.e., guilt related to feeling that she is not doing enough to promote her child's development), and (3) maternal autism knowledge (i.e., factual knowledge of the core deficits in autism, etiology of autism, and effective intervention methods). To examine construct validity, associations between these new measures of parenting cognitions and maternal self-efficacy were investigated.

The internal consistency of both the agency and autism knowledge measures were .79, suggesting strong internal consistency, as 0.8 indicates excellent internal validity (Landis & Koch, 1977). The structure of the guilt measure did not permit interitem analysis. Although evidencing high internal consistency, the Autism Knowledge Questionnaire did not demonstrate adequate variability.

As hypothesized, agency was positively correlated with maternal self-efficacy, whereas guilt, maternal depression, and parenting stress were negatively correlated with maternal self-efficacy, lending support to the construct validity of the new measures. Also consistent with expectations, autism knowledge was positively correlated with agency such that mothers who were more active in promoting the development of their child were likely to have greater autism knowledge. This finding in the expected direction supports the construct validity of the autism knowledge measure.

There was also support for the new measures representing independent constructs. The statistically significant correlations between agency and autism knowledge, and agency and guilt were small (.21 and $-.20$, respectively), suggesting that agency is related to both autism knowledge and guilt but constitutes a

separate construct. The lack of a statistically significant correlation between guilt and autism knowledge may indicate that these two cognitions are unrelated or reflect restricted range on the autism knowledge measure, because there was a trend level association between the guilt and autism knowledge ($p = .07$).

Thus, a major contribution of this article is the introduction of two new measures, Maternal Agency and Maternal Guilt, that can be used to assess aspects of maternal cognitions among mothers raising a child with autism that seem to play a role in mother's self-evaluation of parenting efficacy. At this point, we cannot recommend the use of the Autism Knowledge questionnaire, as there was considerable restriction in the range of parental responses. The strong psychometric properties observed and preliminary evidence for construct validity highlight the complexity of relevant parenting cognitions and experience and may offer new avenues for supporting parents as they meet the challenges of raising a child with autism.

Limitations and Future Directions

A major limitation of the present study was that diagnoses of children were reported by mothers and not verified by direct observation or structured interview. In addition, the sample was one of convenience and participants were mostly from high socioeconomic status and two-parent households. This bias is likely attributable to the fact that the primary method of data collection was via the Internet. It is conceivable that low-income and single mothers may experience even more parenting stress than reported by most participants in this study because of difficulty of finding childcare or respite care for children with disabilities, the expense of providing for a child with a disability, and/or the challenge of being a sole caregiver for a child who has special needs. Studies of women living in conditions of economic disadvantage indicate higher rates of depressive symptoms (Bassuk, Buckner, Perloff, & Bassuk, 1998; Belle & Doucet, 2003; Miranda & Green, 1999). Moreover, there is evidence that income may predict parenting stress in families of children with a broad range of disabilities (Smith et al., 2001). Johnston et al. (2003) found that low income was associated with greater parenting stress among mothers of children with Fragile X syndrome. In general, single mothers also experience higher rates of depression (Cairney, Boyle, Offord, & Racine, 2003) and higher levels of parenting stress (Weinraub & Wolf, 1987) than mothers who live with partners. These studies, however, do not address the unique challenges of raising a child with an autism spectrum disorder. Although some mothers who identified as members of ethnic and/or racial minority groups participated in study (12% of total participants), the sample was not ethnically or racially diverse. Replication in socioeconomically and ethnically diverse samples of mothers and fathers is needed, as there have been few studies of minority populations (e.g., Chavira et al., 2000).

Investigating parenting cognitions among fathers is another worthy direction of study. There is evidence that there are significant gender-related differences in the parenting experiences of parents of children with intellectual disabilities (Bruce, Schultz, Smyrnios, & Schultz, 1994). Mothers reported greater overall parenting stress and more intense feelings of grief than did fathers. Beckman (1991) found that mothers of children with physical or intellectual disabilities experienced more depression, more restric-

tion in their parenting role, less parenting competence, and fewer problems with attachment to their children than their husbands. Hence, the association between parenting self-efficacy and agency, guilt and autism knowledge among fathers may contrast with the associations found among mothers.

Moreover, the kind of maternal guilt investigated in this study involved feelings of not doing enough for one's child with autism. It is important to examine other possible aspects of guilt such as feeling responsible for contributing to the child's disorder via genetic material and/or feeling responsible for irrational reasons. Future studies with a qualitative component about the content of maternal guilty thoughts and the impact of these thoughts on mothers' emotional state and relationship with their children would add to our understanding of mothers' experiences. Qualitative longitudinal studies may be particularly valuable in elucidating how parenting cognitions of caregivers of children with autism vary over time.

Finally, the present study used a within-group design to address the role of parenting cognitions within families raising a child with autism. It is not clear how similar parenting cognitions influence parenting efficacy among families raising children with other developmental disabilities. Such comparative work would require the development of parallel, disorder-specific items within the Agency and Knowledge scales as not all items are appropriate for use across developmental disability groups.

Implications for Service Delivery, Research, and Intervention

Service Delivery

It is interesting that approximately 40% of the mothers reported elevated depressive symptoms with scores above the clinical cutpoint of 16 on the CES-D. This data is consistent with findings from previous studies (Sharpley et al., 1997). Similarly, 63% of mothers were above the clinically significant stress level of 90 on the PSI. Consistent with earlier research in mothers of children with autism (Dumas et al., 1991; Olsson & Hwang, 2001; Sanders & Morgan, 1997; Sharpley et al., 1997; Smith et al., 2001), mothers in this sample reported elevated depressive symptoms and parenting stress, suggesting that mothers of children with autism may benefit from supportive intervention addressing maternal well-being. Greater informal parental support (i.e., from friends and family), but not greater formal parental support (i.e., from health professionals), has been associated with less parenting stress among mothers and fathers of children with disabilities (Beckman, 1991). It is conceivable that informal social support involves a component of parent-directed emotional support while professional intervention focusing on promoting the child's development does not include direct emotional support for parents. Family-based interventions involving an explicit component of parent-based emotional support may be helpful in reducing parenting stress, depression and guilt among parents of children with autism.

There was a very high correlation between mothers' scores on the parenting stress index and the CES-D depression measure such that mothers who had elevated stress levels above the clinical cutpoint on the PSI were 6.6 times more likely to have elevated depressive symptoms above the clinical cutpoint on the CES-D. Given the cross-sectional nature of the data collected, it is impos-

sible to determine the directionality of this association. However, it is important to note this co-occurrence when considering clinical intervention. It is possible that helping parents reduce parenting stress may alleviate symptoms of depression or that addressing parents' depressive symptoms may indirectly reduce their parenting stress.

As hypothesized, depression and parenting stress were negatively associated with feelings of maternal self-efficacy to a significant degree. It may be important to address a mother's depressive symptoms before involving her in parenting interventions because high levels of depressive symptoms such as hopelessness, helplessness, low motivation, difficulty concentrating, and negative beliefs about oneself and the future may interfere with her ability to engage in interventions. Reducing parenting stress and increasing feelings of self-efficacy may also help to relieve depressive symptoms. Teti, O'Connell, and Reiner (1996) found that self-efficacy mediates the negative effect of depression on parenting. Hence, interventions designed to boost mothers' self-efficacy may minimize the effects of depression on her interactions with her children. Because half the mothers in our sample reported elevated depressive symptoms, addressing maternal self-efficacy along with depression in interventions may greatly help the child.

Research

The parenting cognition measures seem to assess domains that are important and account for unique variance in maternal self-efficacy, a well-established construct that has been associated with positive parenting behaviors (Gross, Fogg, & Tucker, 1995; Spoth, Redmond, Haggerty, & Ward, 1995; Teti & Gelfand, 1991). Wells-Parker, Miller, and Topping (1990) demonstrated that higher levels of self-efficacy were positively associated with mothers' active coping orientation in interactions with their children. Conversely, lower levels of self-efficacy have been associated with a more passive, coping-focused orientation in the parenting role with negative child outcomes (Swick & Hassell, 1990; Wells-Parker et al., 1990). Agency was positively correlated with maternal self-efficacy in this study, and adopting a high degree of agency may be an active type of coping strategy. Given that maternal self-efficacy has been associated with observed positive parenting in multiple samples (Gross et al., 1995; Spoth et al., 1995; Teti & Gelfand, 1991), the next step will be to investigate whether maternal reports of agency, guilt, and autism knowledge are associated with observed parenting behaviors among mothers raising children with autism.

Intervention

Mothers who had another child with a disability were more likely to have lower maternal self-efficacy and higher parenting stress, perhaps because of the additional demands of caring for more than one child with a disability. This interpretation is consistent with a research study in which greater child care responsibility among full-time working mothers was associated with lower levels of well-being (Ozer, 1995). Mothers who had another child with a disability, however, were more likely to feel depressed than mothers with one child with autism. The time elapsed since diagnosis and child age positively correlated with higher feelings of self-efficacy but not with depression or parenting stress. Hence,

although mothers were more likely to feel effective in their parenting role with increased time since diagnosis and when their affected children were older, they were not less likely to experience elevated depressive symptoms or parenting stress.

When designing interventions for mothers, it will be important to consider the time elapsed since diagnosis and children's age in the target population. Different interventions addressing maternal well-being in mothers of recently diagnosed, younger children versus long-time diagnosed, older children may be needed. For example, parents of adolescents with autism may experience parenting stress related to planning long-term care for their child and helping their child navigate issues of sexuality, whereas parents of toddlers with autism may experience parenting stress related to learning about how to obtain services for their child and coping with a recent diagnosis. Attention to family life cycle stages may inform the development of effective interventions.

It is striking that 80% of mothers reported feelings of guilt related to not doing enough for their child with autism. Mothers who felt high levels of guilt were more likely to have lower levels of agency and higher levels of parenting stress. Among mothers who reported feelings of guilt and were asked whether this interfered with their parenting, 21% thought that their guilt interfered with their ability to effectively parent their child. That mothers endorsed this association suggests that addressing feelings of parenting guilt in interventions may be a way in which service providers can collaboratively discuss with parents how feelings and thoughts may interfere with optimal parenting. Early home-based intervention programs rarely include an explicit component in which the service provider asks about a parent's feelings and beliefs about parenting a child with autism, despite the known challenges inherent in this task. It is plausible that if service providers give mothers the opportunity to express feelings and beliefs about low parenting self-efficacy and guilt, the providers can provide a normative framework for the mothers' feelings and beliefs. This may facilitate mothers feeling less guilty in the parenting role and having more energy to adopt a more active role in their children's lives. It is important to note, however, that maternal guilt may not be unique to mothers raising a child with autism. Given the multiple role demands that working and non-working mothers experience (Granrose & Kaplan, 1996; LeMaster, Marcus-Newhall, Casad, & Silverman, 2005; Peeters, Montgomery, Bakker, & Schaufeli, 2005), mothers with typically developing children or children with special needs unrelated to autism may also experience this global sense of guilt tied to a belief of not doing enough for their child.

Assessment of parenting cognitions may lead to more effective dyadic and family-based interventions. In various populations including premature infants, children with disabilities, children who have adolescent mothers, and children enrolled in Head Start, the effectiveness of early intervention services in modifying children's behaviors is moderated by changes in parental behaviors (Mahoney, Boyce, Fewell, Spiker, & Wheeden, 1998; Peters, 1988). Helping children with autism by empowering parents to adopt more effective behaviors may prove fruitful. Moreover, if parenting cognitions are associated with parenting behaviors in parents of children with autism, it may prove beneficial to design interventions that target parenting behavior through parenting cognitions.

Furthermore, it is critical to consider how psycho-educational interventions may be used to impact parenting cognitions and promote well-being among parents of children with autism. This is especially crucial around the time of diagnosis, because many parents of children with intellectual disabilities report that receiving the diagnosis is the most stress-inducing life event related to the child's disability (Baxter et al., 1995). Moreover, parent-centered interventions involving individual psychotherapy or clinician-led support groups may be helpful for parents experiencing substantial depression, parenting stress, feelings of guilt, and/or low parenting self-efficacy.

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Appendix: New Measures of Maternal Agency, Guilt and Autism Knowledge

Maternal Agency Questionnaire

Please circle the number that indicates how strongly you agree or disagree with the following statements.

<i>How often do you . . .</i>	NEVER	SELDOM	SOMETIMES	OFTEN	ALMOST ALWAYS
1. learn new ways to encourage your child's language and cognitive development?	1	2	3	4	5
2. discipline your child?	1	2	3	4	5
3. choose or decide on an intervention strategy or treatment for your child?	1	2	3	4	5
4. educate your child?	1	2	3	4	5
5. teach your child social skills?	1	2	3	4	5
6. contribute to your child's quality of life?	1	2	3	4	5
7. serve as an advocate for your child to receive services?	1	2	3	4	5
8. learn new ways to manage your child's challenging behaviors?	1	2	3	4	5
9. provide feedback to your child's Early Intervention or school team about progress?	1	2	3	4	5
10. let professionals "who know best" (school officials, pediatricians, psychologists) decide on your child's education plan and medical intervention.	1	2	3	4	5
11. read books or articles on autism?	1	2	3	4	5
12. communicate with other parents of children with autism?	1	2	3	4	5
13. attend conferences or workshops on autism?	1	2	3	4	5
14. make play dates with other children or seek out structured activities for your child to socialize?	1	2	3	4	5
15. follow your child's lead and focus of attention when playing with your child?	1	2	3	4	5
16. educate family members about autism?	1	2	3	4	5
17. show your child affection?	1	2	3	4	5
18. tell your child in words how to play with toys?	1	2	3	4	5
19. tell or show your child what to do in play to help them play at a more advanced developmental level?	1	2	3	4	5
20. imitate or copy your child's sounds, playful actions or play behaviors?	1	2	3	4	5

(Appendix continues)

Maternal Guilt Questionnaire

1. Do you ever feel responsible or guilty because you believe that you are not doing as much for your child with autism as you think you should be doing?

NO (If NO, Please skip to the next page.)

YES (IF YES, Please answer 2a. through 2c. below.)

2a. How often do you feel this way? (Please check one.)

- Everyday or almost every day
 Weekly
 Monthly
 Four to eleven times a year
 Less than four times a year

2b. When are you most likely to feel this way?

(Check as many situations as may apply for you.)

- Family gatherings
 Family celebrations (e.g., birthdays, anniversaries, holidays)
 Vacations
 Spending time with children who do not have autism
 Spending time with parents of children who do not have autism
 After I have had a conflict with my partner or family member
 When a family or friend offers me parenting advice
 When I am by myself
 When I am feeling down and blue
 When I am feeling overwhelmed by caring for my child with autism (e.g., dealing with discipline, coordinating activities and services)
 When I am feeling angry
 When I see a younger, typically developing child do something that my child cannot do.
 Other: Please Describe _____

2c. Do you feel that this feeling ever interferes with your ability to effectively parent your child?

Yes No

Maternal Autism Knowledge Questionnaire

Please read the following statements about autism and circle whether you think the statement is true or false. If you are not sure of your answer, you can take a guess or circle DK for "don't know".

	True	False	Don't Know
1. There is currently no medical test to diagnose autism.	T	F	DK
2. The biggest problem with diagnosing autism is that symptoms do not appear until age five or older.	T	F	DK
3. Autism occurs in roughly equal numbers of boys and girls.	T	F	DK
4. There is no one recognized treatment for autism.	T	F	DK
5. Typically, autistic children can outgrow autism.	T	F	DK
6. Autistic children have poor communications and social skills because they are geniuses in math.	T	F	DK
7. Many scientists think that heredity and genes play a role in autism.	T	F	DK
8. Most scientists and doctors know what causes autism.	T	F	DK
9. It is estimated that as many as 1 million Americans suffer from autism.	T	F	DK
10. Over half of the number of children with autism has been found to be the result of poor parenting.	T	F	DK
11. Autism affects people of all races and ethnicities at about the same rate.	T	F	DK

Maternal Autism Knowledge Questionnaire (*continued*)

	True	False	Don't Know
12. Children with autism can form strong attachments to their parents or caregivers.	T	F	DK
13. Autism is a brain disorder.	T	F	DK
14. Most children with autism have "savant-like" gifts, special talents or skills in an area such as math, drawing or memory for unusual details.	T	F	DK
15. Many children with autism have trouble tolerating loud noises or certain types of touch.	T	F	DK
16. There is currently no cure for autism.	T	F	DK
17. Many children with autism repeatedly spin objects or flap their arms.	T	F	DK
18. Physical punishment, such as spanking, is more effective with children with autism than for children without autism.	T	F	DK
19. Mothers who do not express affection openly can make their child develop autism.	T	F	DK
20. Because they are more stubborn than other children, children with autism often do not respond when called by name.	T	F	DK
21. There are only minor differences between Autistic and retarded children.	T	F	DK
22. Many children with autism have difficulty using everyday language to communicate their needs.	T	F	DK
23. Autism is more common in the U.S. as compared to other countries.	T	F	DK
24. Many children with autism get upset if their routine is changed.	T	F	DK
25. Children with autism often like to play "make-believe" or "pretend" games.	T	F	DK
26. The number of diagnosed cases of autism has increased over the past 10 years.	T	F	DK
27. The earlier treatment of autism starts, the more effective it tends to be.	T	F	DK
28. Children with autism do not usually imitate or copy their peers.	T	F	DK
29. Many children with autism have trouble sleeping.	T	F	DK
30. There is a wide range of severity among children with autism.	T	F	DK
31. Children with autism cannot learn any social skills.	T	F	DK
32. All people with autism are extremely impaired and cannot live independently as adults.	T	F	DK
33. Children with autism do not need love or attention.	T	F	DK
34. People with autism have trouble understanding facial expressions.	T	F	DK
35. Children with autism cannot show affection.	T	F	DK
36. Children with autism are never too old to benefit from treatment.	T	F	DK
37. Children with autism do not behave as well in public as other children because their parents do not discipline them enough.	T	F	DK
38. It is hard to predict the behavior of a child with autism because they often have unusual sensitivities.	T	F	DK
39. Children with autism withhold affection in order to get their way.	T	F	DK
40. When children with autism misbehave, it is usually because they are trying to get attention.	T	F	DK
41. Children with autism do not usually imitate or copy their peers because they are extremely independent.	T	F	DK

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