
Predicting Parenting Stress in Families with Preschoolers with Disabilities

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Introduction

This study investigated the relationship between child characteristics and parenting stress among families of preschool children with developmental disabilities, including those with autism spectrum disorders. Autism spectrum disorders (ASD) are characterized by impairments in social interaction and communication, and restricted, repetitive and stereotyped patterns of behavior, interests and activities (American Psychiatric Association, *DSM-IV-TR*, 2000). Chronic and pervasive, ASDs involve atypical social, communication, and behavioral characteristics that pose significant challenges for parents and families (Schieve, Blumberg, Rice, Visser, & Boyle, 2007). Moreover, substantial evidence demonstrates the need to investigate the relations between various child characteristics and parenting stress, given that parents of children with ASDs report more stress, depression, and caregiving burden than parents of typically developing children (Baker, McIntyre, Blacher, Crnic, Edelbrock, & Low, 2003; Weiss, 2002) or parents of children with other developmental disabilities (Abbeduto, Seltzer, Shattuck, Krauss, Orsmond, & Murphy, 2004).

Baker-Ericzen and colleagues (2005) found that parents of toddlers

with ASDs had significantly higher levels of child-related stress (i.e., child characteristics and behaviors that are stressful to parents) as reported on the Parenting Stress Index (Abidin, 1995). Phetrasuwan and Miles (2009) also studied parenting stress among parents of children with ASDs and found that the highest sources of overall parenting stress were: managing the child's demanding behaviors and upset feelings, imposing discipline, and dealing with the child's behavior in public places. The most salient ASD-specific symptoms reported to be stressful to parents included difficulties relating to people, expressions of fear or nervousness, the child's emotional responses, and verbal communication issues (Phetrasuwan & Miles, 2009). Although studies suggest that parenting a child with an ASD can be stressful, scholars have not yet adequately addressed the relationship of various parenting stress measures. Nor have scholars addressed the functional relationship between specific child characteristics and subsequent impacts on parenting stress during the preschool years for parents of children with developmental disabilities including ASDs.

Autism spectrum disorders are the fastest growing neurodevelopmental disorders in childhood (Centers for Disease Control and Prevention, 2007). Current prevalence estimates suggest that 1 in 110 children will be diagnosed with an ASD (Centers for Disease Control and Prevention, 2011). Increasing evidence demonstrates the urgency of early diagnosis and intervention practices to afford children and families the most favorable outcomes. Given that parenting stress may decrease the effectiveness of early intervention for children with ASDs (Osborne, McHugh, Saunders, & Reed, 2008), understanding what factors may influence or predict parenting stress is an important research priority. Surprisingly, few studies have specified which child characteristics are most related to parent stress in children with developmental disabilities. Therefore, my research will extend previous work and fill this gap in the literature.

This study (a) investigated whether the various types of parenting stress and mental health measures (i.e. Parenting Daily Hassles, Family Impact Questionnaire, and Parenting Stress Index) are related; (b) evaluated whether child characteristics (i.e. demographics, adaptive behavior, problem behavior and social skills) and parenting stress in families with preschool aged children with developmental disabilities are related; and, (c) determined, after controlling for child demographic variables, to what extent individual child characteristics predict parenting stress. Previous findings suggested the existence of positive correlations among the various types of parenting stress and mental health measures (a). Also, previous research suggested that parents would have higher self-reported stress, negative family impact, and depressive symptomatology as a function of parenting a child with lower adaptive functioning, higher maladaptive and problem behavior, and lower social skills (b). Finally, we expected that maladaptive functioning, problem behavior and low social skills, traits more common in children with ASD than typically developing children, would be the most predictive of parenting stress, negative family impact and depressive symptomatology (c). In contrast to previous research, however, findings from this study suggest that, in general, problem behavior is the most predictive child characteristic of parent stress, negative family impact, and depressive symptomatology, regardless of ASD diagnosis.

Method

Participants

The data were taken from a sample of families (N = 98) with preschool-aged children with developmental disabilities who were included in a larger study involving a 12-week parent training intervention (Principal Investigator, McIntyre). Specifically, the group consisted of 80 boys and

18 girls; 58 of the 98 had developmental delays, and 40 had been diagnosed with an autism spectrum disorder ($M_{\text{age}} = 46.81$ months, age range: 2-5 years old). See Table 1 for demographic comparisons between developmental delay (DD) and autism spectrum disorder (ASD) groups. The data were collected over a 2-year period (2004–2006) by Laura Lee McIntyre while she was a faculty member in the Department of Psychology at Syracuse University. Some of the participants were included in a randomized controlled trial to investigate how The Incredible Years Parent Training Program (with modifications for children with developmental disabilities) compared to care-as-usual (control) in terms of increased positive parent-child interactions and decreased child problem behaviors (McIntyre, 2008). Analysis of this extant database affords an excellent opportunity to further investigate the impact of children's behavior and characteristics on parenting stress. Moreover, the existence of a parent training program offers indirect support to this study because parents of children with developmental disabilities, particularly parents of children with ASDs, often experience negative parent-child interactions as a result of child behavior problems, which in turn lead to elevated parent stress. For these reasons many parent-training interventions have been developed to support families of children with ASD and other developmental disabilities.

The families who participated in the study were all residents of New York State. As is the case for many other studies, small sample size continues to be a challenge for researchers in this field. Although data were collected from participating families pre- and post-treatment, the current study uses pre-assessment measures only to maximize the sample size, given that the response to intervention is not a focus of the current study. Originally, all assessments were collected in the participants' homes. To analyze the original data set, the current study used measures that focused on child characteristics and parenting stress and well being.

Measurements for Child Characteristics

Demographics. Demographic data were collected on children participating in the study. Of relevance to the current investigation were: age, sex, race, and diagnosis (autism or other developmental disability).

Adaptive behavior. The Vineland Adaptive Behavior Scales (VABS; Sparrow et al., 1984) is a structured interview given to individuals with or without disabilities to assess adaptive behavior. Primary caregivers served as respondents on four subscales: (a) Communication, (b) Daily Living Skills, (c) Socialization, and (d) Motor Skills. These subscales were combined to make up the Adaptive Behavior Composite standard score ($M = 100$; $SD = 15$).

Maladaptive behavior. The Child Behavior Checklist for Ages 1½-5 (CBCL; Achenbach, 2000) is a 99-item parent-reported checklist that indicates child problems in both internalizing and externalizing domains. Caregivers respond to questions on a scale of not true (0), somewhat or sometimes true (1), or very true or often true (2) now or within the past 2 months. The CBCL yields a Total Problem score, broad-band Externalizing and Internalizing scores, and narrowband scores (Emotional Reactivity, Anxious/Depressed, Somatic Complaints, Withdrawn, Sleep Problems, Attention Problems, Aggression Problems, and Other Problems).

Social skills. The Social Skills Rating Scale (Gresham & Elliot, 1990) assesses children's social skills and problem behavior. The Social Skills Scale, which is of relevance to the current study, is a 38-item scale in which caregivers report the perceived frequency and importance of their children's social behaviors in the domains of cooperation, assertion, responsibility, and self-control. The combined scores of the four domains comprise a Total Social Skills score.

Measures of Parenting Stress and Well-Being

Parenting stress. The Parenting Stress Index, 3rd edition (PSI-3; Abidin, 1995) asks caregivers to use a five-point scale ranging from strongly agree to strongly disagree to assess a variety of child and caregiver characteristics. The index used six child domain scales (Distractibility/Hyperactivity, Adaptability, Reinforces Parent, Demandingness, Mood, and Acceptability) and seven parent domain scales (Competence, Isolation, Attachment, Health, Role Restriction, Depression, and Spouse). An additional Life Stress Index of 19-items covered a range of stressors.

Parenting daily stress experiences. The Parenting Daily Hassle (PDH; Crnic & Greenberg, 1990) questionnaire measures a parent's everyday stress occurrences. The PDH is a 20-item index of parent's daily stress experiences pertaining to typical child rearing activities. The caregiver rated the frequency and intensity of each hassle.

Family impact. The Family Impact Questionnaire-FIQ (Donenber & Baker, 1993) is a 50-item questionnaire that asks about a "child's impact on the family compared with the impact other children his/her age have on their families." Of interest to this study are two scales, the Negative Impact on Feelings about Parenting (9 items) and Social Relationships (11 items); the two scales were combined to form a Negative Impact Composite (see McIntyre, 2008).

Parent depression/well-being. The Center for Epidemiologic Studies-Depression Scale (CES-D; Radloff, 1977) is a 20-item self-report to measure parent's depressive symptoms of moods and feelings.

Results

After dividing the sample families into two groups—those with a child with an ASD and those with a child with a developmental delay (DD) but not an ASD—the demographics for the two groups were com-

pared (see Table 1). The groups did not differ on most items, either related to the child (age, sex, race, received early intervention) or related to the family/mother (biological mother, age, education–bachelors degree, living with partner, government aid, siblings with learning or behavioral problems, parent learning disability, parent mental health problem). However, chi-square significance tests revealed that the DD group had significantly fewer children living with their biological mothers, $\chi^2(1, N = 98) = 8.55$, $p < .01$, and significantly more children with siblings who had learning or behavioral problems, $\chi^2(1, N = 98) = 4.94$, $p < .05$.

Interrelations of parenting stress measures

Pearson correlation analysis was used to address the first research question of whether there are correlations among various parenting stress measures (Parenting Daily Hassles, Family Impact Questionnaire, and the Parenting Stress Index). Fifteen of the twenty-one inter-correlations of parenting stress measures were significantly positively related with Pearson r coefficients ranging from low (.20) to very high (.81) in that as parents reported higher levels of stress on subscales of the PSI, they also tended to report higher negative family impact (FIQ-Negative) and more depressive symptomatology (CES-D). (See Table 2.) The following six intercorrelations did not have significant relationships: PSI–Life Stress X PSI–Child Domain, PDH X PSI–Child Domain, PDH X PSI–Parent Domain, PDH–Life Stress, FIQ–Negative X PSI–Life Stress, and CED–D X PSI–Life Stress.

Interrelations of child characteristics and parenting stress measures

As with the first question, Pearson correlation analysis was used to explore the second research question of whether there are correlations between the child characteristics (i.e. demographics, adaptive behavior, problem behavior and social skills) and parenting stress in families with

preschool aged children with developmental disabilities. The results revealed some surprising relationships. For example, children's greater adaptive behavior on the Vineland Adaptive Behavior Scales (i.e., communication, daily living skills, socialization and motor skills) was significantly negatively related to higher scores on the PSI-Child Domain, $r(97) = -.22, p < .05$, and significantly positively related to higher scores on the PSI-Parent Domain, $r(97) = .21, p < .01$, and PSI-Life Stress, $r(97) = .28, p < .01$. Also, maladaptive child characteristics and problem behavior captured by the Child Behavior Checklist (CBCL), and lower social skills measured in the Social Skills Rating System (SSRS) were significantly related to higher ratings of parent stress and depressive symptomatology on the PSI-Child Domain, PSI-Parent Domain, PSI-Total, FIQ-Negative, and the CES-D measures, respectively (Table 3). Notably, a significant correlation existed between gender and PDH, with parents of boys tending to identify higher levels of parenting daily hassles. These findings warrant further investigation to evaluate specific child behaviors on the Vineland and subdomains of the CBCL and SSRS to determine if there were differences between families with a child with an ASD and those with a child with another DD.

ASD and DD group comparisons

On the CBCL, children in the ASD group had more withdrawn behavior, $t(96) = 3.22, p < .001$, and less anxious/depressed behavior, $t(96) = 3.28, p = .001$, than children in the DD group. On the SSRS, children in the ASD group tended to show less cooperation, $t(95) = 2.68, p < .05$, less assertion, $t(95) = 4.91, p < .001$, and less responsibility, $t(95) = 4.87, p < .001$. A comparison of the scoring for both groups on the parenting stress and mental health measures revealed that they were similar on all sub-domains except PSI Acceptability (Child). An examination of that exception

showed that parents of children in the ASD group reported higher parent stress due to the child's behavior being less acceptable than the parents had hoped for or expected, $t(94) = -2.30, p < .05$.

Predictors of parenting stress

Finally, seven hierarchical linear regressions allowed an exploration of the third research question. After controlling for child demographic variables, the extent to which individual child characteristics predict parenting stress. The goal of using that set of seven regressions was to determine which child characteristics accounted for reported parent stress (PSI Total, PSI Child, PSI Parent, PSI Life Stress, FIQ Negative, PDH, and CES-D). Child demographics (Step 1) were entered first (age, gender, ASD diagnosis), followed in step 2 by child characteristics (Vineland, CBCL, SSRS). In all analyses, two blocks were entered in consecutive order to control for demographics and understand the variance accounted for by child characteristics. Results are presented in Tables 6-12. Notably, child characteristics accounted for 38% of the variance on the PSI–Total, 59% of the variance on the PSI–Child domain, 20% of the variance on the PSI–Parent domain, 9% of the variance on the PSI–Life Stress scale, 41% of the variance on the FIQ–Negative scale, and 19% of the variance on the CES–D. Although child characteristics did not account significantly for the variance on the PDH, child demographics did play a role, accounting for 9% of the variance.

Discussion

Researchers have suggested that parents of children with ASDs report more stressful events than parents of children with other developmental disabilities (Smith et al., 2010) and also that among caregivers of individuals with neurodevelopmental disorders, higher levels of stress seem to be elicited by the behaviors unique to children with ASD (Lyons et al., 2010).

This study evaluated the correlations among child characteristics and parenting stress in families of preschoolers with a developmental delay (DD) or a diagnosed autism spectrum disorder (ASD) and determined the extent to which child characteristics predicted parenting stress on various mental health outcome measures.

Correlations among various parenting stress measures

It was expected that all measures would have significant positive correlations. However, the data did not support that hypothesis. Although the majority of measures had significant positive intercorrelations, six did not. Notably, the PDH did not correlate with either the PSI–Child Domain, PSI–Parent Domain, or the PSI–Life Stress scale. Also, the PSI–Life Stress scale did not correlate with either the PSI–Child Domain, FIQ–Negative, or the CED–D. These findings suggest two separate but related conclusions. First, as the PDH captures common daily hassles (e.g., sibling arguments, children resisting bedtime, children underfoot, children interrupting), it makes sense that parents of children with or without developmental delays would experience these daily occurrences, and these experiences do not explain unique heightened parent stress. Rather, atypical child behavior may be more important than common daily hassles in determining stress. Second, the PSI–Life Stress scale can capture potentially stressful sources beyond the parent’s control, especially stressors that seem unrelated to a child’s behavior, negative impact on the family by their child’s behavior, or depressive symptomatology. These findings may be a function of socio-economic status, housing, job loss/change, or some other environmental influence that is not captured in the measures. Further, because there is a depression subscale built into the PSI–Parent Domain, which was in fact significantly related to the PSI–Life Stress scale, the lack of a relationship between the PSI–Parent Domain and the CES-D is surprising. These

findings are somewhat incongruent with the hypothesis and previous literature that parenting stress is related to depressive symptoms on the CES-D (Phetrasuwan and Miles, 2009).

Correlations among child characteristics and parenting stress

Based on the current body of literature, caregivers were expected to report higher levels of stress, negative family impact, and depressive symptomatology as a function of parenting a child with lower adaptive functioning, higher maladaptive and problem behavior and lower social skills. Moreover, parents of children with an ASD were expected to report higher levels of stress, negative family impact and depressive symptomatology than parents of children with DD. A Pearson correlation analysis was conducted followed by comparison analysis between groups (DD vs. ASD). In the preliminary correlation analyses, children's maladaptive problem behavior and lower social skills were related to higher self-reported parent stress, negative family impact, and depressive symptomatology. These findings are consistent with recent literature that has argued that children's behavior problems tend to be the most stressful, namely the lack of prosocial behavior (Lecavalier, Leone & Wiltz, 2006). However, in this study, higher adaptive functioning measured by the Vineland (i.e., communication, daily living skills, socialization, and motor skills) was significantly related to higher reported parenting stress on the PSI-Child Domain. This unexpected finding may speak to the nature of having a high-functioning child with a disability. Parents' expectations of their child's behavior may be lower if the child has a moderate to severe delay, whereas a parent with a child with a mild to moderate delay (i.e., high functioning) may have unrealistic expectations for the child's behavior and experience more stress. In other words, a parent's appraisal of a child's behavior may also contribute to reported parent stress. Clearly,

more research is needed to determine if this is the case.

Next, the responses for both the DD and ASD groups were compared on the measures of child characteristics and parenting stress. Results from the CBCL showed that children with ASD tended to have less anxious/depressed behavior and more withdrawn behavior than children with DD. This finding makes sense because, given the symptomatology of ASDs, children with ASDs tend to be or seem to be more withdrawn and show less emotion compared to similar-age peers. Additionally, children in the ASD group tended to display less cooperation, assertion, and responsibility on the SSRS. Importantly, as social skills are a vital part of preschoolers' daily interactions with family, friends, and community members, deficits in social skills are predictive of parent stress. Neece and Baker (2008) found that children's social skills accounted for elevated maternal parent stress beyond factors of intellectual level and behavior problems. Clearly social skills deficits in children with ASDs interfere with parent's expectations, which may then influence parent-child interactions and overall parent affect.

Results from the parenting stress and mental health measures showed that the groups were similar on all sub-domains except PSI Acceptability-Child. This domain captures stress arising from the child's behavior being less acceptable than the parents had hoped or expected. We anticipated that the groups would differ, and that parents of children with ASD would report higher parent stress, higher negative family impact and more depressive symptomatology. Previous research has been inconsistent on this point. In one instance, data suggests that even the most knowledgeable parents and caregivers of children with autism, regardless of demographics, reported high levels of stress and aggravation (Schieve et al, 2007). However, Phetrasuwan and Miles (2009) found no change in parenting stress as a function of the child's autistic symptoms. These results

highlight the need to continue investigating parent stress among groups of parents who have children with different developmental disabilities. Currently, there is no general agreement that parenting a child with ASD or developmental delay of any nature will predict or guarantee a more stressful parenting/caregiving experience than parenting a child without a delay.

Notably, gender differences were not significant between the DD and ASD groups but gender was significantly related to parenting daily hassles, in that parents of boys tended to report more daily hassles. This could be related to the high number of boys in the study ($n = 80$, $N = 98$). Because it is more common for boys to have a DD or an ASD than girls, it is expected that in studies of this nature the majority of participants will be male. Likewise, the majority of primary caregivers and survey respondents tend to be mothers, as we found in this study. However, it is not clear whether differences exist in levels of stress related to parenting a boy or girl with a DD or ASD, whether the caregiving/parenting experience for fathers is different, or whether there is something unique about the mother-son dyad that promotes more stress.

Predicting parenting stress from child characteristics

The current body of literature suggests that parenting a child with higher maladaptive functioning, problem behavior and lower social skills would be the factors most predictive of parenting stress, negative family impact and depressive symptomatology, regardless of child demographics. This was the case for all outcome measures except the PDH, in which gender was the only significant predictor. This result suggests that something about parenting a boy is uniquely difficult. Importantly, all other models revealed that child characteristics significantly accounted for the variance. Specifically, adaptive behavior accounted significantly for

the variance on the PSI–Total, PSI–Parent domain, and PSI–Life Stress. Social skills accounted significantly for the variance on the PSI–Child domain. Problem behavior accounted significantly for the variance on the PSI–Total, PSI–Child, PSI–Parent, FIQ–Negative scale, and CES–D. Consistent with our findings, Baker-Ericzen and colleagues (2005) found that maternal stress on the PSI–Child domain was significantly predicted by a child’s level of social skills, while parents of toddlers with ASD had significantly higher stress in both PSI–Child and PSI–Parent domains compared to parents with typically developing children.

It is understood that the more severe the ASD, the greater the impairment in social interaction and atypical behavior. Lyons, Leon, Phelps, & Dunleavy (2010) found that severity of ASD was the primary and most stable predictor of caregiver stress, such that, the higher the ASD severity, the higher the caregiver stress. Parents of children with ASD seem to be at-risk for stress and depressive symptomatology compared with parents of typically developing children and parents of children with other developmental disabilities, yet the findings from this study suggest this differentiation is not as clear. In fact, a subset of families, regardless of ASD diagnosis, may be more negatively affected by their pre-existing expectations for their children’s behavior rather than the child’s level of functioning alone. This possibility was exemplified by our finding that the PSI–Acceptability subdomain revealed a significant difference between the ASD and DD groups, the only significant finding among all subdomains of parent stress and mental health outcomes. Because diagnosis of ASD did not significantly account for the variance in any hierarchical linear regression model, parent stress cannot be reliably predicted simply by having an ASD diagnosis. Moreover, regardless of an ASD diagnosis, having a high-functioning child with a developmental disability seemed to cause more parent stress than having a low-functioning child.

Limitations

There are several limitations to these findings, and the results should be interpreted with care. Self-selection is an issue; parents who self-select to be in a study may be seeking to find a solution, can afford the opportunity, and live in a geographical region to have access to participate in a study. Therefore, the participants are less likely to be representative of the national or global ASD or DD population and their families. Although the issue of self-selection exists here, the heterogeneous sample of participants in this study are representative of the region from which the data were drawn. Another limitation is that the measures, intended to capture the construct of self-reported parent stress, were primarily completed by mothers. It would be interesting to see what differences in levels of parent stress might be reported by fathers. Mothers are often the primary caretakers and tend to be the most representative in parent reporting procedures in this field of research. The parent-child relationship is of particular importance to healthy outcomes for families and further research is required to understand if these results are exclusive to the mother's appraisal, or are representative of the stress felt by both parents. A third limitation is that the severity of ASD was unknown, and we cannot determine which specific child characteristics of one ASD classification contribute to reported parent/caregiver stress. Although the severity of the delay was important for inclusion in the study, that stipulation did not specifically extend to the severity of ASD. In other words, children needed to be delayed as determined by the Vineland Adaptive Behavior Scales, but the severity of ASD was outside the scope of this study. Furthermore the severity of the delay may not be as important as a parent's appraisal of their child's behavior on subsequent parenting stress and negative family impact.

Summary and Implications

This study extends previous research that a child's maladaptive and problem behavior strongly relates to parent stress and depressive symptomatology. In general, parents of children with ASD and parents of children with a developmental delay reported similarly on measures of stress and depressive symptomatology. Our findings support the notion that regardless of the existence of an ASD diagnosis, parenting a preschooler with maladaptive and problem behavior is difficult enough to elicit stress and negative affect. Unfortunately that stress may interfere with effective parenting, and in turn, lead to decreased positive parent-child interactions. Moreover, the preschool years are a critical developmental period to implement interventions. Because previous evidence suggested that child characteristics, negative family impact, and parenting stress were stable in the preschool years (Baker et al., 2003), it will be important for future research to investigate whether the severity of a developmental delay exclusively affects stress. The current study casts doubt on the notion that a child's lower functioning is predictive of elevated parent stress and highlights the need for further research. Also, previous research as well as this study related parenting stress to depressive symptoms. That relationship is likely bi-directional, in that stress and depressive symptoms are not mutually exclusive and may both serve to lower perceptions of well-being. This is an important consideration for future research pertaining to development and implementation of family and parent intervention.

Finally, although outside the scope of this study, the genetic heritability of ASD may play a role, such that measuring a parent's broad autism phenotype (BAP) (i.e., behavior characteristic of ASD) may help clarify past findings of stress among families with children with ASD. Recent research is beginning to shed light on the relationship between parent stress, BAP, and child characteristics. Ingersoll and Hambrick (2011)

measured parent depression, parenting stress, child symptom severity, parent broader autism phenotype (BAP), coping strategies, social support, and demographic characteristics. After controlling for demographic variables, regression analyses showed that parents with higher ratings of broad autism phenotype used more maladaptive coping strategies, had greater symptomatology for depression, and less social support. Because our findings suggest that parent appraisal may play a large role in determining parent stress, future research is still needed to understand the role of parent broad autism phenotype to parent-child interactions.

References

- Abbeduto, L., Seltzer, M. M., Shattuck, P., Krauss, M. W., Orsmond, G., & Murphy, M. M. (2004). Psychological well-being and coping in mothers of youths with autism, Down syndrome, and fragile X syndrome. *American Journal of Mental Retardation*, 109, 237.
- Abidin, R. R. (1995). *Parenting Stress Index*, Third Edition: Professional Manual. Odessa, FL: Psychological Assessment Resources, Inc.
- Achenbach, T. M., & Rescorla, L. A. (2000). *Manual for the ASEBA Preschool Forms & Profiles*. Burlington, VT: University of Vermont, Research Center for Children, Youth, & Families. 254.
- American Psychiatric Association. (2000). *Diagnostic and statistical manual of mental disorders* (4th ed., text rev.). Washington, DC: Author.
- Baker, B. L., McIntyre, L. L., Blacher, J., Crnic, K., Edelbrock, C., & Low, C. (2003). Pre-school children with and without developmental delay: behavior problems and parenting stress over time. *Journal of Intellectual Disability Research*, 47, 217-230.
- Baker-Ericzen, M. J., Brookman-Frazee, L., & Stahner, A. (2005). Stress levels and adaptability in parents of toddlers with and without autism spectrum disorders. *Research & Practice for Persons with Severe Disabilities*, 4, 194-204.
- Bromley, J., Hare, D. J., Davison, K., & Emerson, E. (2004). Mothers supporting children with autism spectrum disorders: social support, mental health status and satisfaction with services. *Autism*, 8, 409-423.
- Centers for Disease Control and Prevention. (2007). Prevalence of autism spectrum disorders—autism and developmental disabilities monitoring network, six sites, United States, 2000. *Morbidity and Mortality Weekly Report Surveillance Summaries*, 56(SS-1), 1-11. Retrieved May 8, 2011 from <http://www.cdc.gov/mmwr/PDF/ss/ss5601.pdf>
- Centers for Disease Control and Prevention (2011). *Facts about ASDs*. Retrieved May 8, 2011 from <http://www.cdc.gov/ncbddd/autism/facts.html>
- Crnic, K. A., & Greenberg, M. T. (1990). Minor parenting stresses with young children. *Child Development*, 61, 1628-1637.

- 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.
- Gresham, F. M., & Elliott, S. N. (1990). *Social skills rating system*. Circle Pines, MN: American Guidance Service.
- Hastings, R. P., Kovshoff, H., Brown, T., Ward, N. J., Espinosa, G. D., & Remington, B. (2005). Coping strategies in mothers and fathers of preschool and school-age children with autism. *Autism*, 9, 377-391.
- Ingersoll, B., & Hambrick, D. Z. (2011). The relationship between the broader autism phenotype, child severity, and stress and depression in parents of children with autism spectrum disorders. *Research in Autism Spectrum Disorders*, 5, 337-344.
- Lecavalier, L., Leone, S., & Wiltz, J. (2006). The impact of behaviour problems on caregiver stress in young people with autism spectrum disorders. *Journal of Intellectual Disability Research*, 50, 172-183.
- Lyons, A. M., Leon, S. C., Phelps, C. E., & Dunleavy, A. M. (2010). The impact of child symptom severity on stress among parents of children with asd: The moderating role of coping styles. *Journal of Child and Family Studies*, 19, 516-524.
- McIntyre, L. L. (2008). Parent training for young children with developmental disabilities: Randomized controlled trial. *American Journal on Mental Retardation*, 113, 356-368.
- Neece, C., & Baker, B. (2008). Predicting maternal parenting stress in middle childhood: The roles of child intellectual status, behavior problems and social skills. *Journal of Intellectual Disabilities Research*, 12, 1114-1128.
- Osborne, L. A., McHugh, L., Saunders, J. & Reed, P. (2008). Parenting stress reduces the effectiveness of early teaching interventions for autistic spectrum disorders. *Journal of Autism and Developmental Disorders*, 38, 1092-1103.
- Phetrasuwan, S. & Miles, M. S. (2009). Parenting stress in mothers of children with autism spectrum disorders. *Journal for Specialists in Pediatric Nursing*, 14, 157-165.
- Radloff, L. S. (1977). The CES-D Scale: A self-report depression scale for research in the general population. *Applied Psychological Measurement*, 1, 385-401.

- Schieve, L. A., Blumberg, S. J., Rice, C., Visser, S. N., & Boyle, C. (2007). The relationship between autism and parenting stress. *Pediatrics*, 119, 114-121.
- Smith, L. E., Hong, J., Seltzer, M. M., Greenberg, J. S., Almeida, D. M., & Bishop, S. L. (2010). Daily experiences among mothers of adolescents and adults with autism spectrum disorder. *Journal of Autism and Developmental Disabilities*, 40, 167-178.
- Sparrow, S., Balla, D., & Cicchetti, D. V. (1984). *The Vineland Adaptive Behavior Scales (Survey Form)*. Circle Pines, MN: American Guidance Service.
- Weiss M. J. (2002). Hardiness and social support as predictors of stress in mothers of typical children, children with autism, and children with mental retardation. *Autism*, 6, 115-130.

Table 1
*Demographics of Families of Children with Developmental
Delay and Autism Spectrum Disorders (N = 98)*

Demographic	DD (n = 58)	ASD (n = 40)	t or χ^2
<u>Child</u>			
Age in Months <i>M (SD)</i>	47.17 (10.29)	46.29 (10.74)	$t = 0.41$
Sex % (n) Male	75.9 (44)	90.0 (36)	$\chi^2 = 3.16$
Race – Caucasian % (n)	77.9 (45)	85 (34)	$\chi^2 = .83$
Received Early Intervention (0-3yrs) % (n)	74.1 (43)	87.5 (35)	$\chi^2 = 2.60$
<u>Mother/Family</u>			
Maternal Status - Biological mother % (n)	75.9 (44)	97.5 (39)	$\chi^2 = 8.55^{**}$
Maternal Age in Years <i>M (SD)</i>	34.79 (8.80)	34.70 (5.63)	$t = .06$
Maternal Education - Bachelors Degree % (n)	32.8 (19)	47.5 (19)	$\chi^2 = 2.17$
Working (part- or full-time) % (n)	42.9 (24)	42.5 (17)	$\chi^2 = .001$
Living with Partner % (n)	77.6 (45)	87.5 (35)	$\chi^2 = 1.55$
Government Aid % (n)	46.6 (27)	33.3 (13)	$\chi^2 = 3.48$
Siblings with Learning or Behavioral Problems % (n)	62.5 (25)	36.4 (12)	$\chi^2 = 4.94^*$
Parent Learning Disability % (n)	27.6 (16)	13.2 (5)	$\chi^2 = 2.80$
Parent Mental Health Problem % (n)	45 (18)	13.2 (5)	$\chi^2 = 4.03^*$

Note. * $p < .05$, ** $p < .01$.

Table 2

Correlations among various Parenting Stress Measures (N = 98)

Variable	1	2	3	4	5	6	7
1. PSI-Child Domain	—						
2. PSI-Parent Domain	.49***	—					
3. PSI-Total Stress	.81***	.91***	—				
4. PSI-Life Stress	-.03	.32***	.20*	—			
5. PDH	.17	.19	.21*	-.15	—		
6. FIQ-Negative	.70***	.61***	.75***	.10	.23*	—	
7. CES-D	.47***	.71***	.70***	.18	.31*	.60***	—

Note. * $p < .05$, ** $p < .01$, *** $p < .001$. PSI = Parenting Stress Index 3rd Edition, Child Domain, Parent Domain, Total Stress, and Life Stress; PDH = Parenting Daily Hassles; FIQ = Family Impact Questionnaire Negative Impact Composite; CES-D = Center for Epidemiologic Studies-Depression Scale.

Table 3

Correlations Among Child Characteristics and Parenting Stress and Mental Health Outcomes (N = 98)

Variable	PSI Child	PSI Parent	PSI Total	PSI Life Stress	PDH	FIQ Negative	CES-D
1. ASD Diagnosis	.06	-.04	>.00	-.18	.08	.07	.02
2. Age	.04	.03	.04	-.09	.17	-.04	.12
3. Gender	.08	-.03	.02	.01	-.25*	-.08	-.05
4. Vineland ABC	-.22*	.21**	.04	.28**	-.03	-.02	>.00
5. CBCL Total	.75***	.33***	.58***	.14	.05	.58***	.40***
6. SSRS Total	.50***	.31**	.45***	.13	.07	.41***	.32***

Note. * $p < .05$, ** $p < .01$, *** $p < .001$. ASD Diagnosis = 0 = DD; 1 = ASD; Gender (1 = Male; 2 = Female); Vineland ABC = Vineland Adaptive Behavior Scales Adaptive Behavior Composite Standard Score; PSI = Parenting Stress Index 3rd Edition, Child Domain, Parent Domain, Total Stress, and Life Stress; PDH = Parenting Daily Hassles; FIQ = Family Impact Questionnaire Negative Impact Composite; CES-D = Center for Epidemiologic Studies-Depression Scale.

Table 4

Comparison of Children with Developmental Delay and Autism Spectrum Disorders (N = 98)

Variable	DD (n = 58)		ASD (n = 40)		t
	M	SD	M	SD	
Vineland ABC	63.98	9.78	60.73	8.49	1.75
CBCL Total Problems	67.90	31.6	63.30	21.4	.86
CBCL Externalizing	24.90	11.5	22.88	9.58	.94
CBCL Internalizing Broadband	17.95	11.2	17.33	6.42	.35
CBCL Emotional Reactivity	5.79	4.00	4.83	2.75	1.42
CBCL Anxious/Depressed	4.50	3.76	2.42	1.89	3.22***
CBCL Somatic Complaints	2.95	2.47	3.30	2.15	-.75
CBCL Withdrawn	4.71	3.23	6.78	2.82	-3.28***
CBCL Sleep Problems	5.48	3.82	4.72	4.41	.88
CBCL Attention Problems	5.66	2.81	5.70	2.20	-.09
CBCL Aggressive Problems	19.24	9.75	17.18	8.50	1.11
CBCL Other Problems	19.57	9.80	18.38	6.23	.68
SSRS Total Social Skills	107.0	15.0	104.7	11.9	.80
SSRS Cooperation	7.05	3.33	5.33	2.94	2.68*
SSRS Assertion	10.26	3.94	6.64	2.89	4.91***
SSRS Responsibility	4.60	3.95	1.36	1.58	4.87***
SSRS Self-Control	7.36	3.45	6.82	3.11	.81

Note. * $p < .05$, ** $p < .01$, *** $p < .001$. Vineland ABC = Vineland Adaptive Behavior Composite (standard score). CBCL = Child Behavior Checklist (Total Problems and Broadband T scores, Narrowband raw scores); SSRS = Social Skills

Table 5

*Comparison of Parenting Stress and Mental Health Outcomes between
Parents of Children with Developmental Delay and Autism Spectrum Disorders (N = 98)*

Variable	DD (n = 58)		ASD (n = 40)		t
	M	SD	M	SD	
PSI Total Stress	268.86	49.14	269.28	44.64	-.04
PSI Child Domain	133.98	25.26	136.68	18.72	-.60
PSI Parent Domain	134.88	31.86	132.31	31.39	.39
PSI Life Stress	11.63	8.69	8.59	7.65	1.81
PSI Distract/Hyperactive (Child)	32.10	6.17	32.95	5.62	-.70
PSI Adaptability (Child)	33.33	7.84	33.05	5.68	.20
PSI Reinforces Parent (Child)	11.57	3.99	12.28	4.01	-.86
PSI Demandingness (Child)	26.31	6.83	26.26	6.12	.04
PSI Mood (Child)	12.78	3.86	12.28	3.33	.83
PSI Acceptability (Child)	18.24	4.40	20.24	3.77	-2.37*
PSI Competence (Parent)	31.21	7.96	30.82	8.02	.23
PSI Isolation (Parent)	15.02	5.54	14.77	4.56	.24
PSI Attachment (Parent)	12.43	3.26	11.79	3.64	.88
PSI Health (Parent)	14.81	4.71	14.46	3.84	.40
PSI Role Restriction (Parent)	20.48	5.76	21.69	5.89	-1.00
PSI Depression (Parent)	22.17	7.60	21.03	6.74	.78
PSI Spouse (Parent)	19.48	6.30	18.49	5.88	.79
FIQ Negative Impact Composite	29.53	11.81	31.15	11.83	-.66
Parenting Daily Hassles Total	109.67	35.78	114.68	27.60	-.78
CES-D	15.77	11.84	16.20	9.01	-.19

Note. * $p < .05$, ** $p < .01$, *** $p < .001$. PSI = Parent Stress Index-III; FIQ = Family Impact Questionnaire; CES-D = Center for Epidemiological Studies Depression Scale.

Table 6

Hierarchical Linear Regression Analysis Predicting Parenting Stress Index–Total Score from Child Demographics and Child Characteristics

Predictor	PSI–Total	
	ΔR^2	β
Step 1 – Child demographics	.00	
Age		.04
Gender		.02
ASD diagnosis		.01
Step 2 – Child characteristics	.38***	
Adaptive behavior (Vineland)		.59***
Social skills (SSRS)		-.18
Problem behavior (CBCL)		.25*

Note. * $p < .05$. *** $p < .001$. Vineland = Vineland Adaptive Behavior Scales Adaptive Behavior Composite Standard Score; SSRS = Social Skills Rating System Social Skills Total Standard Score; CBCL = Child Behavior Checklist 1 ½ - 5 Total Problems T Score.

Table 7

Hierarchical Linear Regression Analysis Predicting Parenting Stress Index–Child Domain Score from Child Demographics and Child Characteristics

Predictor	PSI–Child	
	ΔR^2	β
Step 1 – Child demographics	.01	
Age		.04
Gender		.10
ASD diagnosis		.08
Step 2 – Child characteristics	.59***	
Adaptive behavior (Vineland)		-.02
Social skills (SSRS)		-.17*
Problem behavior (CBCL)		.73***

Note. * $p < .05$. *** $p < .001$. Vineland = Vineland Adaptive Behavior Scales Adaptive Behavior Composite Standard Score; SSRS = Social Skills Rating System Social Skills Total Standard Score; CBCL = Child Behavior Checklist 1 ½ - 5 Total Problems T Score.

Table 8

Hierarchical Linear Regression Analysis Predicting Parenting Stress Index–Parent Domain Score from Child Demographics and Child Characteristics

Predictor	PSI–Parent	
	ΔR^2	β
Step 1 – Child demographics	.00	
Age		.03
Gender		-.04
ASD diagnosis		-.05
Step 2 – Child characteristics	.20***	
Adaptive behavior (Vineland)		.39***
Social skills (SSRS)		-.15
Problem behavior (CBCL)		.36***

Note. * $p < .05$. *** $p < .001$. Vineland = Vineland Adaptive Behavior Scales Adaptive Behavior Composite Standard Score; SSRS = Social Skills Rating System Social Skills Total Standard Score; CBCL = Child Behavior Checklist 1 ½ - 5 Total Problems T Score.

Table 9

Hierarchical Linear Regression Analysis Predicting Parenting Stress Index–Life Stress Domain Score from Child Demographics and Child Characteristics

Predictor	PSI–Life Stress	
	ΔR^2	β
Step 1 – Child demographics	.04	
Age		-.09
Gender		-.03
ASD diagnosis		-.18
Step 2 – Child characteristics	.09*	
Adaptive behavior (Vineland)		.26*
Social skills (SSRS)		.09
Problem behavior (CBCL)		.19

Note. * $p < .05$. Vineland = Vineland Adaptive Behavior Scales Adaptive Behavior Composite Standard Score; SSRS = Social Skills Rating System Social Skills Total Standard Score; CBCL = Child Behavior Checklist 1 ½ - 5 Total Problems T Score.

Table 10

Hierarchical Linear Regression Analysis Predicting Family Impact Questionnaire–Negative Domain Score from Child Demographics and Child Characteristics

Predictor	FIQ–Negative	
	ΔR^2	β
Step 1 – Child demographics	.02	
Age		-.05
Gender		-.07
ASD diagnosis		-.07
Step 2 – Child characteristics	.41***	
Adaptive behavior (Vineland)		.12
Social skills (SSRS)		-.18
Problem behavior (CBCL)		.62***

Note. * $p < .05$. *** $p < .001$. Vineland = Vineland Adaptive Behavior Scales Adaptive Behavior Composite Standard Score; SSRS = Social Skills Rating System Social Skills = Total Standard Score; CBCL = Child Behavior Checklist 1 ½ - 5 Total Problems T Score.

Table 11

Hierarchical Linear Regression Analysis Predicting Parenting Daily Hassles Score from Child Demographics and Child Characteristics

Predictor	PDH	
	ΔR^2	β
Step 1 – Child demographics	.09*	
Age		.15
Gender		-.25*
ASD diagnosis		.05
Step 2 – Child characteristics	.01	
Adaptive behavior (Vineland)		.03
Social skills (SSRS)		-.11
Problem behavior (CBCL)		.04

Note. * $p < .05$. Vineland = Vineland Adaptive Behavior Scales Adaptive Behavior Composite Standard Score; SSRS = Social Skills Rating System Social Skills Total Standard Score; CBCL = Child Behavior Checklist 1 ½ - 5 Total Problems T Score.

Table 12

Hierarchical Linear Regression Analysis Predicting Center for Epidemiological Studies Depression Scale Score from Child Demographics and Child Characteristics

Predictor	CES-D	
	ΔR^2	β
Step 1 – Child demographics	.02	
Age		.12
Gender		-.05*
ASD diagnosis		.02
Step 2 – Child characteristics	.19***	
Adaptive behavior (Vineland)		.19
Social skills (SSRS)		-.16
Problem behavior (CBCL)		.41***

Note. * $p < .05$. *** $p < .001$. Vineland = Vineland Adaptive Behavior Scales Adaptive Behavior Composite Standard Score; SSRS = Social Skills Rating System Social Skills Total Standard Score; CBCL = Child Behavior Checklist 1 ½ - 5 Total Problems T Score.