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Results: This study found that the child's behavioural and emotional impairments predicted the parents' overall levels of distress (i.e., stress/tension, anxiety and depression) but not the stress associated with parenting. Instead, the child's social impairment severity was found to predict parenting specific stress.
Conclusion: This study highlights the pervasive influence of ASD symptomatology on the mental well-being of the parents and the importance of assisting parents to cope with the -behavioural and social impairments of their child.

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The predictors of distress in parents of children with Autism Spectrum Disorders.

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Abstract

Background: It is well recognised that parents of children with Autism Spectrum Disorder (ASD) often experience clinically significant levels of stress and depression. This study examined which ASD characteristic best predicted parental distress. **Method:** Parents of 109 children aged between four and 12 (mean age = 7.89, *SD* = 2.43), completed self-report measures of anxiety, depression, stress and parenting-specific stress. They also completed rating scales regarding their child's ASD characteristics. **Results:** This study found that the child's behavioural and emotional impairments predicted the parents' overall levels of distress (i.e., stress/tension, anxiety and depression) but not the stress associated with parenting. Instead, the child's social impairment severity was found to predict parenting specific stress. **Conclusion:** This study highlights the pervasive influence of ASD symptomatology on the mental well-being of the parents and the importance of assisting parents to cope with the -behavioural and social impairments of their child.

Keywords: parenting stress; parental distress; Autism Spectrum Disorders (ASDs).

Autism spectrum disorder (ASD) is an umbrella term that is used to describe neurodevelopmental disabilities that are characterized by impairments in reciprocal social interactions, impairments in verbal and non-verbal communication skills, and stereotyped behaviour, interests and activities. DSM-IV-TR disorders classified under ASD include autistic disorder (AD), Asperger's syndrome (AS), and pervasive developmental disorder not otherwise specified (PDD-NOS), including atypical autism. Proposed revisions to the DSM-5 include combining these DSM-IV-TR diagnoses into a single broad ASD group (DSM-5 Development, 2011). Parents of children with ASD often report levels of stress and depression that fall within clinical ranges on self-report scales (Baker-Ericzen, Brookman-Frazee & Stahmer, 2005). These parents also report higher levels of stress and depression in comparison to parents of children with other developmental disorders (Estes, Munson, Dawson, Koehler, Zhou & Abbott, 2009). Furthermore, parental stress ratings have been found to be positively associated with the child's ASD symptom severity and negatively associated with the effectiveness of treatment for ASD (Osborne, McHugh, Saunders & Reed, 2008, Lecavalier, Leone & Wiltz, 2006).

Parents of children with ASD are believed to report higher levels of distress, in comparison to other parent populations, due to the greater demands children with ASD place on their parents because of the wide range of behavioural problems and impairments that are associated with this condition (Tomanik, Harris & Hawkins, 2004). Exactly which behaviours or impairments contribute the most to parental distress is not clear. Measures of severity of ASD and symptomatology have been reported to be most associated with parental stress and depression (e.g., Hastings & Johnson, 2001, Kasari & Sigman, 1997, and Eisenhower, Baker & Blacher, 2005). While in other research, behavioural measures of conduct problems, social behaviours, disruptive and rule-breaking behaviours have been reported to be most associated with parental stress and depression (Lecavalier, Leone & Wiltz, 2006; Baker, McIntyre, Blacher, Crnic, Edlebrock & Low, 2003; Baker, Blacher & Olsson, 2005). Parental distress has also been associated with social impairment, with difficulties with social relatedness and social

interaction being most consistently related to parental stress when compared to internalizing/externalizing behaviours (Davis & Carter, 2008). The social interaction skills of the child with ASD have also been reported to significantly predict maternal stress (e.g., Baker-Ericzen, Brookman-Frazee & Stahmer, 2005), with the caregivers of more socially responsive children reporting less parenting stress compared to caregivers of less socially responsive children (Kasari & Sigman, 1997). Parents have been found to rate social impairment as one of the most stressful aspects of parenting children with ASD (Bebko, Konstantareas & Springer, 1987).

While a range of factors have all been reported to contribute strongly to parental distress, exactly which factors contribute the most remains unclear. One reason for the lack of clarity is that previous studies have often analysed the contribution of only one or two of these factors to parental stress and depression. The different findings reported in the literature might also be due, in part, to the manner in which the ASD child characteristics have been measured (Estes, Munson, Dawson, Koehler, Zhou & Abbott, 2009). The behavioural characteristics of the children with ASD have often been measured on broad behavioural instruments such as the Connors Behaviour Rating Scale (Connors, 1997) or the Child Behaviour Checklist (Achenbach, 1991) which are not specific enough to tap behaviours that are characteristic of ASD. Consequently, these instruments may not tap into the ASD characteristics that have the greatest impact on the parents' well-being. It has been recommended that researchers need to use measures of core ASD characteristics in order to explore the range of ASD related problems faced by the parents of these children (Tomanik, Harris & Hawkins, 2004, Lecavalier, Leone & Wiltz, 2006). In line with these recommendations, the current study examined the characteristics of ASD that predicted parental distress (i.e., stress, anxiety and depression) by using measures that are regarded to be more specific to ASD. Furthermore, unlike previous studies that have analysed the contribution of only one or two ASD-related factors to parental distress, the current study examined a broad spectrum of

ASD symptomatology with the aim of clarifying which of these ASD child characteristic contributed the most to levels of parental distress.

One component of the social impairment observed in children with ASD is their difficulty in expressing empathy (Baron-Cohen, 1995). While social skills impairment in children with ASD has been found to contribute to parental distress (Baker-Ericzen, Brookman-Frazee & Stahmer, 2005; Kasari & Sigman, 1997; Tomanik, Harris & Hawkins, 2004), the ability of the child with ASD to express empathy has not been specifically examined in these studies on parental distress. The current study addressed this gap in the literature by including a measure of the child's ability to express empathy (i.e., the Griffith Empathy Measure; Dadds, et al., 2007).

The contribution of ASD characteristics to parental distress have also been found to vary with the child's age. For example, the association between severity of ASD and maternal stress has been found to be strongest in younger, toddler-aged children (Eisenhower, et al, 2005). In older children, conduct problems and lack of pro-social behaviours were found to be most strongly associated with parental stress (Lecavalier, Leone & Wiltz, 2006). Recently, Osborne and Reed (2009) confirmed this trend in their study involving children aged two to 16 years. They examined a range of ASD child characteristics (i.e., child behaviour problems, ASD severity, intellectual functioning and adaptive behaviour) in relation to parenting stress levels. The association between each child variable and parenting stress was examined while controlling for the influence of the other variables. They found that parenting stress was more strongly associated with the child's behaviour problems rather than the ASD severity. However, in younger children (i.e., less than four years of age) the severity of the child's ASD had a stronger association with parenting stress. The authors suggested that one explanation for these differences may be that with younger children, the impact of the diagnosis and the build-up of stress leading up to diagnosis is a traumatic experience for parents. As their children become older, prolonged coping with the problem behaviours may be more of a source of distress. However, results inconsistent with this

pattern have also been reported. For example, mothers of preschool children with ASD reported that problem behaviours, as measured by a composite score of the Aberrant Behaviour Checklist (Aman & Singh, 1986) were most associated with stress and depression, over the diagnosis of ASD (e.g., Estes, Munson, Dawson, Koehler, Zhou & Abbott, 2009). Most studies that have examined the relationship between children's behaviours and parental stress have mainly focused on groups of either toddlers or older children. Tomanik, Harris and Hawkins (2004) has suggested that it would be beneficial to include a wider range of ages in the sample, to compare whether predictors vary in strength of association with parental distress based on the child's age. In response to this suggestion, this study has used a sample of parents with children aged between 4 to 12 years.

Method

Participants

Participants were parents of 109 children aged four to 12 years diagnosed with an ASD (i.e., Autistic Disorder, Asperger's Syndrome or Pervasive Developmental Disorder Not Otherwise Specified). Only one parent was required to participate given that no significant differences between mother's and father's ratings of their child's behaviour have been reported in the literature (e.g., Baker et al, 2003).

The participants' children were comprised of 87 boys and 22 girls (*Mean age* -7.89, *SD*-2.43). Sixty-six children had been diagnosed with Autistic Disorder, 30 with Asperger's Syndrome, and 13 with PDDNOS. Consistent with some previous research in this area, the current researchers relied on existing diagnosis (Tomanik, Harris and Hawkins, 2004). The average time since diagnosis was 45.6 months, ranging from 1 to 120 months.

Procedure

Participants were recruited through notices in newsletters, forums, websites and waiting rooms in parent advocacy groups, private psychology practices, specialist autism schools, early intervention centres, and autism societies within Australia. Interested participants contacted the researcher directly via phone and/or email. Participants could also contact the school principal to express interest in being involved in the study. A package including an information letter, questionnaires, and a stamped self-addressed envelope was mailed to each participant directly, or given through the school to be completed anonymously. Return of the completed questionnaires was taken as indication of consent to participate.

Materials

The following psychological scales were administered to the participants:

Gilliam Autism Rating Scale (2ⁿᵈ edition): This test was used as a measure of ASD severity. The GARS-2 (Gilliam, 2007) has been evaluated in samples of individuals between the ages of three to 22 years. GARS-2 outcomes correlate well with other screening and diagnostic instruments used for assessing children for ASDs (Eaves, Woods-Groves, Williams, & Fall, 2006). It consists of 42 items scored on three Likert subscales (1) Stereotyped Behaviour, (2) Communication, and (3) Social Interaction. The three subscales can be added to provide a total severity score. Internal consistency estimates using Cronbach's α range between 0.88–0.93 (Gilliam, 2007). This study used the total raw score as a measure of severity (Cronbach's α = .92).

The Nisonger Child Behaviour Rating Form (NCBRF) was used as a more specific measure of ASD behavioural characteristics, (Aman, Tassé, Rojahn, & Hammer, 1996, and Tassé, Aman, Hammer, & Rojahn, 1996). The NCBRF is a rating of emotional and behavioural problems in children with developmental disabilities, and has been evaluated specifically with children with ASD. It consists of 10 social competence items which are rated on a 4-point Likert scale - ('Not true' to 'Completely or always true') and distributed on two sub-scales: Compliant/Calm and Adaptive/ Social. It also has 66 problem

behaviour items rated on a four-point Likert scale ('Did not occur' or 'was not a problem' to 'Occurred a lot' or 'was a serious problem'). The six problem behaviour sub-scales are: Conduct problem, Insecure/anxious, Hyperactive, Self-injury/stereotypic, Self-isolated/ritualistic, and Overly-sensitive. The NCBRF has proven to have good construct validity in an ASD population; with acceptable factor loadings and internal consistencies (Lecavalier et al. 2004). The reliability of the subscales were examined in the current study using Cronbach's α and obtained: .92 for conduct, .92 for insecure/anxious, .85 for hyperactive, .76 for self-injury/stereotypic, .76 for self-isolated/ritualistic, and .78 for overly-sensitive. Raw scores were used in the data analyses.

The Social Responsiveness Scale (SRS) was used as a measure of ASD social characteristics (Constantino, 2002). The psychometric properties of the SRS and its genetic structure have been previously examined by comparison to gold standard ASD diagnostic measures, and have compared favourably (Constantino et al., 2003). Alpha reliability estimates have been reported to be above .90 for the total scale (Constantino, 2002). The SRS is a 65-item parent report measure of children's social impairments in naturalistic social settings, rated on a scale from "0" (never true) to "3" (almost always true). The SRS provides a singular scale score that serves as an index of severity of social deficits in the autism spectrum. The total raw score was used in the data analyses (Cronbach's α = .92).

The Griffith Empathy Measure (GEM) was used to measure the child's empathy expression (Dadds, et al., 2007). The GEM is a 23-item measure in which the respondent answers each item on a nine-point Likert scale from strongly disagree (-4) to strongly agree (+4). The GEM has been reported to have good test–retest reliability over 1-week (r > .89) and 6-month intervals (r > .69), internal consistencies, a stable factor structure across age and gender groups, inter-parental agreement (*r* > .47), and convergence with child reports (*r* = .41) (Dadds et al., 2008). The total raw score was used in the current study (Cronbach's α = .85).

The Parental Stress Scale (PSS) was used to measure stress associated with parenting (Berry & Jones, 1995). The PSS is an 18-item measure for parents of children with and without clinical problems. This scale was selected instead of the Parenting Stress Index (used in previous research) due to its briefer administration. The PSS has been suggested as an alternative to the Parenting Stress Index (PSI) as both focus specifically on stress generated by the parenting role, as opposed to stress that may result from other roles, situations and difficulties. The PSS has been reported to significantly correlate with the PSI total score ($r = .75$, $p < .01$; Berry & Jones, 1995). The total raw score was used in the data analyses in the current study (Cronbach's α = .86).

The Depression, Anxiety and Stress Scale – 21 (DASS-21) (Lovibond & Lovibond, 1995) was used to measure parental distress (i.e., depression, anxiety and stress). This test is a widely used and accepted measure of negative emotional states. The DASS-21 is the short-form of the full 42 item DASS in which each of the three subscales contains seven (rather than 14) items. The DASS–21 has been reported to have high reliability (Cronbach's α for depression .94, anxiety .87 and stress .91), and has a factor structure that is consistent with the allocation of the items to subscales. It exhibits high convergent validity with other measures of anxiety and depression (Antony, Bieling, Cox, Enns, and Swinson, 1998). The following Cronbach's α were obtained in the current study: .89 for Stress, .88 for Anxiety, and .94 for Depression.

Demographic Information: Participants were also asked to provide information on their child's age and gender, ASD diagnosis of their child, and the length of time since the ASD diagnosis was made. The current study did not obtain information regarding parent demographics. The decision to sacrifice parental information was made to shorten the length of time it took to complete all the questionnaires, which was estimated at around 30 to 45 minutes.

Results

The means and standard deviations for the participants on the parental and child variables of interest are presented in Table 1. Closer examination of the data indicated that while the majority of parents reported distress levels within the normal to moderate ranges of the DASS, there were a proportion of parents experiencing clinically significant levels of distress (i.e., 30%, 35% and 22% of parents reported severe to extremely severe levels of stress, depression and anxiety respectively).

[Insert Table 1 here]

A one-way ANOVA was conducted to examine whether there were any significant differences in parental distress (as measured on the DASS and PSS) between the three different ASD diagnoses (i.e., Autistic Disorder, Asperger's Syndrome and PDDNOS. However, no significant differences were obtained ($p > .05$) and type of ASD - was disregarded in subsequent analyses.

The data set was screened for violations of distribution. Data transformations were conducted on variables to address substantial outliers and skew and used in the subsequent analyses (Tabachnick & Fidell, 2001). As this was an exploratory study (designed to include measures of ASD severity, behaviour and social characteristics in the same regression) the total scores for SRS and the GARS, rather than the subscale scores were used.

Common variance bias was expected as parents were being asked to rate their own levels of distress and the severity of their child's ASD characteristics on several measures. It was therefore, important to ensure that multicollinearity was not a problem in the data set. To address this issue, Pearson correlation coefficients were calculated between all the variables to identify correlations above - .70. This criterion has been recommended by -Cohen, Cohen, West and Aiken (2003) as a cut off for

identifying correlations that are sufficiently high to affect the multiple regression analyses. - Medium to large inter-correlations were found between the NCBRF subscale measures. To address this collinearity, the NCBRF subscales measures were combined into an overall NCBRF total score. The items within the positive social subscales of the NCBRF (i.e., Compliant/Calm and Adaptive Social) were reversed scored prior to calculating the sum of the subscale scores. This NCBRF total score provided an overall measure of the behaviour problems associated with ASD.

The correlation coefficient between the GARS and the SRS total scores was found to be significant ($r = .73$, n = 91, $p < .0001$) and greater than the inter-correlation cut-off for identifying multicollinearity. This large inter-correlation is likely to be due to the overlap between the two scales in the measurement of ASD social interaction deficits. The SRS, instead of the GARS, was selected as one of the predictors in the multiple regression analyses. This decision was based on minimising the degree of overlap in the type of ASD symptomatology measured by the predictor variables in the multiple regression analyses.

Examination of the correlation coefficients also identified the independent variables that were significantly correlated with the dependent variables and this was used to reduce the number of predictors in the multiple regression analyses (Field, 2005). Inspection of the correlation matrix showed a non-significant correlation between the GEM and the parental measures of distress (i.e., PSS and DASS subscales). Consequently, the GEM was not used as one of the predictors in the subsequent regression analyses. Of the demographic variables, a significant correlation was found between age and the variable 'time since diagnosis' ($r = .64$, n = 109, $p < .01$). Age was used in the regression analyses for consistency with previous research in this area. Table 2 shows the correlation coefficients between the parent and child variables used in the multiple regression analyses.

[Insert Table 2 here]

Hierarchical multiple regression analysis was used to examine which ASD child characteristics (i.e., SRS total score, and NCBRF total score) predicted parental distress (i.e., PSS, and DASS subscales) after controlling for the influence of age and gender of the child. Four hierarchical multiple regressions were conducted, one for each measure of parental distress. To control for inflation of Type 1 errors, a p value of .01 was used. As recommended by Field (2009), for each multiple regression, the variance inflation factor (VIF), - the tolerance statistic and condition index were examined to check -for significant multicollinearity in the data. The diagnostic statistics obtained indicated that multicollinearity was not a problem in the four sets of analyses (i.e., all VIF values were well below 10, all the tolerance statistics were above 0.2, and all condition indices were below 30).

Table 3 displays the unstandardized regression coefficients (B), the standard error of the unstandardized regression coefficients, and the standardised regression coefficients (β) for the four regression analyses involving the PSS and DASS subscales. The age and gender of the child, which were entered at step one of the regression analyses, were not found to significantly predict parental stress, anxiety or depression scores ($p >$.01). However, the ASD child characteristic measures, which were entered as a set at step two, were found to significantly predict the PSS and the three DASS subscale scores.

[Insert Table 3 here]

The regression examining whether ASD child characteristics significantly predicted the PSS scores of the parents, after controlling for age and gender was found to be significant, $F (4, 89) = 3.98$, $p =$.005. The SRS and NCBRF total scores accounted for 11.4% of the variance. However, only the SRS total score (β $= .27$, $p = .03$) contributed unique variance to the model.

ASD child characteristics significantly predicted the DASS Stress scores of the parents, F (4, 89) = 7.32, p <.0001. Together, these variables accounted for 21.4% of the variance. However, only the NCBRF total score (β = .48, p < .0001) was found to be a significant predictor of parental stress/tension levels.

The final regression model for DASS Anxiety was significant, (F [4, 89] = 6.05, p <.0001), explaining 18% of the variance. Again, only the NCBRF total score (β = .39, p < .0001) contributed unique variance to the model. Examination of the standardised regression coefficients indicated that while not significant, a small effect size was obtained for the SRS total score. The small sample size in relation to the number of predictor variables is likely to have contributed to the non-significance of this predictor variable in the model.

The regression model at step two for DASS Depression was significant (F [4, 89] = 7.44, p < .0001) and accounted for 21.7% of the variance. As in the previous analyses, only the NCBRF total score (β = .44, p < .0001) was found to be a significant predictor in the model. Examination of the standardised regression coefficient for the SRS total score indicated a non-significant but small effect size for this variable. Again, the small sample size is likely to have impacted on the SRS total score not making a statistically significant contribution to the model.

Discussion

This study examined the characteristics of ASD that predicted parental distress (i.e., anxiety, depression, stress and parenting stress) when the influence for the child's age and gender were controlled.

This study found that regardless of the child's age or gender, ASD behavioural problems (as measured by the NCBRF total score) were found to predict parental levels of distress (as measured by the DASS subscales). Increases in ASD behavioural and emotional impairments were associated with increases in parental stress/tension, anxiety and depression. The results of this study suggest that ASD

symptomatology has a pervasive influence on the mental well-being of the parents. These behavioural and emotional problems occur both in the home and in public, perhaps causing embarrassment, restrictions and impacting on parents such that they may experience distress in most areas of their lives.

In this study, the severity of social impairments (i.e., SRS total score) was found to be a predictor of parenting specific stress. This finding is consistent with previous research where social factors have been associated with the parenting stress. For example, Baker-Ericzen, Brookman-Frazee & Stahmer (2005), reported that the social interaction scale of the GARS significantly predicted parenting stress in mothers of children with ASD. Similarly, Tomanik, Harris and Hawkins (2004) found that mothers reported more parenting stress when their children where more irritable, socially withdrawn, hyperactive/non-compliant and unable to interact with others.

While the severity of social impairments in ASD children were found to be associated with the stress associated with parenting, this study found that it did not predict levels of parental distress (i.e., general stress/tension, anxiety and depression). A possible explanation may be that this study used an ASD specific behavioural measure in conjunction with the SRS. It may be that when parents are presented with ASD specific measures of behavioural and social interaction problems, parents rate the behavioural problems as being more distressing than the social interaction problems. The behavioural problems may be more pervasive and demanding than poor social behaviours.

One component of the social impairment observed in children with ASD is their difficulty in expressing empathy, which had not been specifically examined in previous studies on parental distress. Interestingly, the parents' ratings of their child's expression of empathy was not found to be associated with measures of parenting specific stress or measures of parent's levels of distress. One possible explanation is that social behaviours related to empathy are not sufficiently demanding on parents in comparison to other ASD symptomatology.

The current study has several limitations that should be considered in interpreting the results. The small sample size in relation to the number of predictor variables in the multiple regression analyses would have limited the number of significant predictors obtained in the regression analyses. The current study was also not able to examine the contribution of each NCBRF subscale to parental distress due to multicollinearity within the data. A larger sample size should, in part compensate for the collinearity and allow for a more detailed examination of the association between ASD symptomatology and parental distress. One of the difficulties in conducting research within this area is the recruitment of large numbers amongst this parent population. These parents already face demands on their time and energy and may therefore feel less able to participate in research.

It is important to note that this study did not include parent demographic information. As the focus was on child characteristics, questions regarding demographics were sacrificed to reduce the length of time it took to complete all the questionnaires. It would have been helpful to have included parental demographic variables in the data analyses (e.g., gender, age, level of social support, number of other children, ethnicity and socio-economic information) as these may constitute vulnerability or protective factors to parental distress.

Another limitation in the current study is the reliance on parental reports for both measures of parental distress and ASD child characteristics. The severity of the child's characteristics may have been influenced by a range of factors including whether the parent or child was having a 'good day' versus a 'bad day' at the time the child behavioural measures were completed (i.e., the immediate context). The parent's levels of distress would have also been another factor that may have influenced the ratings on these measures in that parents experiencing high levels of distress are probably more likely to report more severe characteristics of ASD in their child. Inclusion of objective third-party measures of ASD diagnosis and severity (e.g., teacher rating scales) would prove useful in future research to reduce common variance from the parent report measures. A further limitation in the current study is the

reliance on existing ASD diagnosis. In Australia, ASD diagnosis can be made by medical professionals without administering the Autism Diagnostic Observation Schedule (ADOS) which is regarded to be the "gold standard" for assessing and diagnosing ASD (De Bildt, Sytema, Ketelaars, Kraijer, Mulder, Volmar, & Minderaa, 2004). By relying on existing diagnoses, a range of diagnostic procedures could have been used which may be less valid than those based on the ADOS. The inclusion of an ASD diagnostic test or screener would have allowed confirmation of the existing diagnosis.

Despite the above limitations, the current study highlights the importance of addressing ASD symptomatology within the context of the parents' mental well being. Providing parents with more assistance and support in managing their child's behavioural, emotional and social impairments will likely help reduce their levels of distress. Given the findings of this study, parents may also benefit from greater education and awareness regarding how the severity of their child's behavioural/emotional problems can impact on their mental health. Greater awareness may lead to greater acceptance of professional assistance and better help-seeking behaviours for mental health concerns amongst this population.

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Table 1: Means and standard deviations for the parent and child variables.

Variables	*M*	*SD*
Age	7.89	2.43
PSS	52.14	11.09
DASS Stress	21.43	10.36
DASS Anxiety	8.95	9.85
DASS Depression	14.04	12.30
NCBRF conduct problems	16.67	10.62
NCBRF insecure/anxious	11.18	9.70
NCBRF hyperactive	13.88	6.15
NCBRF self injury/stereotypic	2.36	3.23
NCBRF self isolated/ritualistic	7.77	4.94
NCBRF overly sensitive	6.95	3.67
NCBRF compliant/calm	7.33	2.82
NCBRF adaptive/social	4.23	1.92
NCBRF Total	77.70	31.46
GARS Total	49.76	22.02
SRS Total	110.94	25.69

PSS Parental Stress Scale*, DASS* Depression Anxiety Stress Scale, *GARS Total* Gilliam Autism Rating Scale-2 total score,

SRS Total Social Responsiveness Scale total score, *NCBRF* Nisonger Child Behaviour Rating Form, Parent Version.

Table 2: Correlation coefficients between the parent and child variables used in the multiple regression analyses.

Variables	1	2	3	4	5	6	8	9
1. PSS	_	.47**	.44**	.53**	.14	-.03	.32**	.30**
DASS								
2. Stress		_	.66**	.71**	.06	.12	.31**	.43**
3. Anxiety	.		_	.67**	.00	.14	.32**	.44**
4. Depression	.			_	.07	.11	.34**	.44**
5. Age					_	.11	.31**	.34**
6. Gender						_	.11	.15
7. SRS Total							_	.58**
8. NCBRF Total								_

PSS Parental Stress Scale, *DASS* Depression Anxiety Stress Scale, *SRS Total* Social Responsiveness Scale total score, *NCBRF* Nisonger Child Behaviour Rating

Form, Parent Version.

**p<.01, two-tailed

Table 3: Hierarchical multiple regression of age, gender, ASD child characteristics as predictors of parental distress (PSS, DASS Stress, Anxiety, and Depression).

PSS	B	SE B	β	ΔR^2
Step 1				.07
Constant	47.64	4.34		
Age	1.05	.43	.25	
Gender	-2.57	2.56	-.10	
Step 2				.09**
Constant	38.58	5.31		
Age	.60	.44	.14	
Gender	-3.23	2.49	-.13	
NCBRF Total	.02	.04	.08	
SRS Total	.10	.05	.27*	
DASS Stress				
Step 1				.01
Constant	8.77	2.21		
Age	.10	.22	.05	
Gender	1.25	1.31	.10	
Step 2				.23***
Constant	5.12	2.48		
Age	-.23	.21	-.12	
Gender	.42	1.16	.03	
NCBRF Total	.08	.02	.48***	

SRS Total	.01	.02	.07	
DASS Anxiety				
Step 1				.02
Constant	.89	.42		
Age	.01	.04	.03	
Gender	.29	.24	.13	
Step 2				.20**
Constant	.12	.48		
Age	-.05	.04	-.13	
Gender	.16	.22	.07	
NCBRF Total	.01	.00	.39**	
SRS Total	.00	.00	.12	
DASS Depression				
Step 1				.02
Constant	1.16	.42		
Age	.03	.04	.08	
Gender	.26	.25	.11	
Step 2				.23***
Constant	.37	.47		
Age	-.03	.04	-.09	
Gender	.10	.22	.04	
NCBRF Total	.01	.00	.44***	
SRS Total	.00	.00	.11	

*p <.05, **p < .01, *** p < .0001

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