



The effect of parenting behaviors on subsequent child behavior problems in Autistic Spectrum Conditions

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Abstract

The current research explored the relationship between parenting behaviors in parents of children with Autistic Spectrum Conditions (ASC) and subsequent child behavior problems. The sample consisted of 72 children (aged 5–16 years) and their parents, who were assessed over a period of 9–10 months. There was a relationship between parenting behaviors and subsequent child behavior problems, but only for the parenting behavior in limit setting. The better the limit setting of the parents at baseline, the fewer child behavior problems were noted at follow-up. Finally, the parenting behavior of limit setting was found to mediate the relationship between parenting stress and subsequent child behavior problems.

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Helping children, and their parents, to manage the problems associated with Autistic Spectrum Conditions (ASC) promotes their quality of life, and that of the family as a whole, relieves the psychological and financial strains on those families, and, ultimately, reduces the financial pressures on external supporting agencies. Many interventions offer benefit to some children with ASC, and there has been research evaluating these interventions (Charman, Howlin, Berry, & Prince, 2004; Dawson & Osterling, 1997; Gresham & MacMillan, 1998; Lovaas, 1987; Reed, Osborne, & Corness, 2007a, 2007b; Rogers, 1998). However, the parental and family influences that contribute to the effectiveness of interventions should also be documented and assessed, to gain a more complete picture of the influencing factors on child behavior problems, and on child outcomes (see Harris, 1984, 1994; Harris, Handlemann, Arnold, & Gordon, 2000; Lovaas & Smith, 2003; Robinson & Anderson, 1983).

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There is increasing research on the effects of ASC on family functioning (e.g., Eisenhower, Baker, & Blacher, 2005; Hastings & Brown, 2002; Hastings & Johnson, 2001; Mash & Johnston, 1983), and also growing amounts of research on the influences of the family, and parents, on the child with ASC (see Blacher, Neece, & Paczkowski, 2005, for a review), especially concerning their effects on the child's behavior problems and outcomes following intervention (e.g., Lecavalier, Leone, & Wiltz, 2006; Robbins, Dunlap, & Plienis, 1991). It is now recognized that focusing purely on the impacts of the intervention on the child with ASC neglects the important role that parents play in the management of their child's problems (Harris et al., 2000). The importance of involving, and preparing, the family in support of the individual undergoing intervention and treatment, across a range of conditions and illnesses, is gaining recognition, as there is growing evidence that such family-oriented interventions show more robust and consistent benefits than purely patient-focused interventions (see Martire & Schulz, 2007). Thus, a more family-oriented approach is arguably required to gain a fuller understanding of the systems, dynamics, and mechanisms that are involved and influential in the development and treatment of the child with ASC.

It is reasonably clear that the personalities of parents of children with ASC are not different from the personalities of parents of children with other disabilities, and, indeed, with no disabilities (e.g., Koegel, Schreibman, O'Neil, & Burke, 1983). In fact, the only obvious factor that sets this group of parents apart from other parents is their extremely high levels of parenting stress (perhaps triggered by the diagnosis of ASC, Shuntermann, 2002; and the cumulative effect of long-term parenting a child with ASC, McAdoo & DeMeyer, 1977). Levels of parenting stress are considerably higher in parents of children with ASC, compared to parents of children with almost any other type of disability, or health problem, as well as compared to parents in the general population (cf. Blacher & McIntyre, 2006; Dunn, Burbine, Bowers, & Tantleff-Dunn, 2001; Eisenhower et al., 2005; Hastings & Johnson, 2001; Koegel, Schreibman, Loos, Dirlich-Wilhelm, & Dunlap, 1992; Perry, Sarlo-McGarvey, & Factor, 1992; Weiss, 2002).

Levels of parenting stress may impact on behaviors of children with learning disabilities. It is well established that there is a strong association between parenting stress and child behavior problems (Baxter, Cummins, & Yiolitis, 2000; Hodapp, Fidler, & Smith, 1998; Lecavalier et al., 2006; Stores, Stores, Fellow, & Buckley, 1998). Recent evidence suggests that high initial levels of parenting stress can lead to subsequent worsening of child behavior problems (Lecavalier et al., 2006; Osborne & Reed, submitted for publication-a), and poorer child outcomes following early teaching interventions (Osborne, McHugh, Saunders, & Reed, submitted for publication; Robbins et al., 1991). In order to explain this finding, it has been proposed that high levels of parenting stress can have an impact on subsequent parenting behaviors, which, in turn, impact on a child's behavior problems, and outcomes. This suggestion has formed part of several theoretical models of parenting (e.g., Deater-Deckard, 1998), which have been applied in the context of developmental disabilities (Hastings, 2002).

There is some evidence to support this suggestion for parents within the general population (Kotchick, Dorsey, & Heller, 2005; Meyers & Miller, 2004; Rodgers, 1993, 1998), and also for parents of children with ASC, in particular (Osborne & Reed, submitted for publication-b). The latter longitudinal research studied the relationship between parenting stress and parenting behaviors in a sample of 138 parents of children with ASC, over a 9–10-month period of time. Parenting stress and some parenting behaviors, namely, involvement with the child, communication with the child, and limit setting for the child, closely interacted bi-directionally with one another over time.

However, although high levels of parenting stress are associated both with subsequently higher levels of child behavior problems, and with later changes in parenting behaviors, it is not

80
81 known whether parenting behaviors are associated directly with subsequent child behavior
82 problems, and poorer outcomes. It could be that both parenting behaviors and child behavior
83 problems are jointly influenced by parenting stress, but that each of these are not directly
84 impacted upon by one another (see Anthony et al., 2005; Blader, 2006). Thus, it is necessary to
85 identify and establish the channels, or mechanisms, of influence that may possibly be involved
86 between parenting behaviors and child behavior problems.

87 Unfortunately, there is virtually no evidence showing a direct link between parenting
88 behaviors and child behavior problems in the context of ASC. There are numerous intervention
89 programs that target the parents of children with ASC. Many of these interventions have noted
90 improvements in the children's behaviors, and functioning, as a result of a reduction in parenting
91 stress, and an increase in parental coping ability (e.g., Harris et al., 2000; Lovaaas & Smith, 2003;
92 Spaccarelli, Cotler, & Penman, 1992; see Brookman-Frazee, Stahmer, Baker-Ericzen, & Tsai,
93 2006, for a comprehensive review). There are several studies that suggest that teaching parenting
94 skills to parents of children with ASC will reduce their children's challenging behaviors. For
95 example, teaching parents 'mindful' parenting reduced aggression, non-compliance, and self-
96 injury in their children, and promoted parental satisfaction with their parenting skills, and their
97 parent-child interactions (Singh et al., 2006). Nevertheless, these results may not reflect a direct
98 relationship between parenting behaviors and child behavior problems, but could reflect the
99 results of a reduction of the parenting stress levels, which, in turn, could have impacted on both
100 parenting behaviors and on child behavior problems, but the latter challenging behaviors may not
101 have been affected via parenting behaviors directly.

102 There is, of course, a considerable literature on the effects of parenting practices and strategies
103 in families of typically developing children. Fenning, Baker, Baker, and Crnic (2007) review this
104 substantial literature, and suggest that the parent characteristics of 'warmth' and 'responsiveness'
105 contribute to a more positive, and adaptive, parenting style which, in turn, facilitates satisfactory
106 social, and emotional, development in the child. On the other hand, low levels of manifest
107 parental 'warmth' correlate with child behavior problems, such as increased externalizing
108 behaviors (e.g., oppositional, and disruptive behaviors). Similarly, a lack of parental
109 'responsiveness', as seen in over-intrusive interventions, over-controlling, and harsh disciplinary
110 parenting styles, are, likewise, associated with child behavior problems. Furthermore, Fenning
111 et al. (2007) note that parental emotional expressiveness, in particular, high expressed
112 frequencies of negative affect, especially anger, can act to inhibit empathic responding, reduce
113 levels of emotional understanding, and increase the probability of prolonged and continuing
114 behavioral problems in the child. However, the relevance of much of this parenting literature to
115 the study of children with ASC might be questionable, as an often proposed mechanism for such
116 links between parenting behaviors, and styles, and child behavior problems, and outcomes, is that
117 of imitation (e.g., Bandura, Ross, & Ross, 1961; Fenning et al., 2007). Given the nature of the
118 deficits involved in ASC, the extent to which such parenting findings can be generalized, or
119 applied, to this specific population is unclear.

120 Some findings that could be relevant, especially as they involve teaching interventions, are
121 those from research conducted on Head Start programs, often involving socio-economically
122 disadvantaged children. In a study by Siantz and Smith (1994), it was found that the parenting
123 styles of the mothers of 60, 3–8-year-old children of Mexican American migrant farm-workers
124 accounted for a significant proportion of the child behavior problems, reported by the mothers.
125 Similarly, Dumas and Wekerle (1995) noted some modest relationship between "dysfunctional
126 parenting" and child behavior problems. However, as these research studies were cross-
127 sectional, and not longitudinal, temporal directionality between these two factors cannot be

discerned (see also similar claims made by Jackson, 2000, and by Jackson & Huang, 2000, on the basis of other cross-sectional correlational studies).

On looking at the longitudinal effects of maternal antisocial behavior, and parenting practices, on behavior problems in boys at risk of developing antisocial behaviors, Ehrensaft et al. (2003) noted that lower levels of maternal involvement, and monitoring, and higher levels of conflict between the mothers and sons, contributed to worse subsequent child behavior problems seen 1 year later. Although the boys' behavior problems were directly worsened by the conduct disorder problems of the mothers, it was established that the effect of parenting was even more contributive to the subsequent child behavior problems. Similarly, Austin, Dunn, Johnson, and Perkins (2004) conducted a longitudinal study which investigated the impact of families on behavior problems of children and adolescents with epilepsy. They found that parental confidence in managing discipline of their child at baseline was correlated with child behavior problems at baseline, and also predicted these behavior problems at follow-up, 24 months later. Moreover, decreasing parental confidence in disciplining their child was related to an increase in child behavior problems over time. Thus, both the study by Ehrensaft et al. (2003), and that by Austin et al. (2004), highlight aspects of limit setting (i.e., monitoring, or managing discipline, see Gerard, 1994) as important parenting behaviors associated with reductions in future child behavior problems. Of course, behavior management skills are also often emphasized in the context of training programs for parents of children with ASC (e.g., Harris et al., 2000).

The above review suggests that there are a number of important theoretical reasons to examine the relationship between parenting behaviors and child behavior problems in an ASC sample. These findings may also have practical implications, and applications, for the development of future interventions for ASC. In particular, there is, firstly, a need to establish a relationship between parenting behaviors and child behavior problems over time, in order to determine the temporal directionality of any such parent–child interactions and relationships. Secondly, there is the need to identify which types of parenting behaviors are influential for subsequent child behavior problems in the context of ASC. Finally, it is important to demonstrate that the parenting behaviors and child behavior problems association is a direct one, which is not the product of both of these behavioral elements being impacted upon by additional factors, such as parenting stress. To achieve these ends, a longitudinal study was conducted in order to measure the family factors operational, across a range of children with ASC, and their parents.

1. Method

1.1. Participants

A total of 83 children with ASC (75 males and 8 females) were identified in conjunction with Local Education Authorities in the South East of England. All of the parents of these children were contacted, and 72 (70 males and 2 females) agreed to participate in the study (86%). Participants were selected on the basis of three criteria, the children had to be 5:0–16:0 years old (mean = 8:8), undergoing a teaching/educational intervention, and independently diagnosed with ASC by specialist Pediatricians, following initial referral from an independent general medical practitioner. All diagnoses were made prior to participating in, and the commencement of, this study. In addition to these independent diagnoses of ASC, all of these children had a statement of Special Educational Needs related to their ASC from their Local Education Authorities.

These independent diagnoses were supported in the present study by the use of the Gilliam Autism Rating Scale (GARS), which allowed further independent assessment of the degree of

171 their autistic severity. The GARS measure showed that the mean (standard deviation) of the
172 overall GARS score for this sample was 89.0 (± 16.2), indicating that this sample was of a slightly
173 milder than average autistic severity. The scores for the four sub-scales of the GARS, each
174 representing a different aspect of the disorder, showed a similar pattern, in that all of these scores
175 were slightly milder than the average. The mean sub-scale scores were *Stereotyped*
176 *Behaviors* = 8.1 (± 2.9); *Communication Problems* = 8.3 (± 3.2); *Social Interaction Pro-*
177 *blems* = 8.1 (± 3.2); and *Developmental Abnormalities* = 8.6 (± 3.0). The intellectual functioning
178 of the children was assessed at baseline by the British Abilities Scale, which revealed a mean
179 *Cognitive Ability Score* at baseline of 80.3 (± 18.4). Similarly the Vineland Adaptive Behavior
180 Scale *Overall Composite* score for these children was 54.7 (± 16.4) at baseline.
181

1.2. Measures

1.2.1. Gilliam Autism Rating Scale

182
183 The GARS (Gilliam, 1995) comprises four sub-scales, each describing behaviors that are
184 symptomatic of ASC (*Stereotyped Behaviors*, *Communication*, *Social Interaction*, and
185 *Developmental Disturbances*). The raw scores from these sub-scales can be converted into
186 standard scores (mean = 10, standard deviation = 3). These sub-scales combine to give an overall
187 *Autism Quotient*; higher scores meaning greater autistic severity (mean = 100 [average autistic
188 severity], standard deviation = 15). The scale is appropriate for persons aged 3–22 years, and is
189 completed by parents or professionals in about 10 min. Its internal reliability is 0.96, and it has
190 high criterion validity with the Autism Behavior Checklist (0.94).
191

1.2.2. British Abilities Scale

192
193 The BAS II (Elliot, Smith, & McCulloch, 1996) is a battery of tests of cognitive abilities,
194 which index educational achievement. It is suitable for use with children and adolescents from
195 2:6 to 17:11 years old. This test allows the calculation of a *General Cognitive Ability* scale
196 (mean = 100, standard deviation = 15), which represents intellectual ability.

1.2.3. Vineland Adaptive Behavior Scale

197
198 The VABS (Sparrow, Balla, & Cicchetti, 1990) is a semi-structured interview, administered to
199 a parent, or other caregiver, of the child. It can be used from birth to 18:11 years, making it
200 suitable for the present cohort. The VABS assesses children's day-to-day adaptive functioning.
201 Scores from three domains of adaptive behavior were used in the present study (*Communication*,
202 *Daily Living Skills*, and *Socialization*). The raw scores can be converted to standard scores, and a
203 *Composite Overall* score can be derived, based on the sum of the sub-scale standard scores
204 (mean = 100; standard deviation = 15). The internal reliability of the *Overall Composite* score is
205 0.93.

1.2.4. Questionnaire on Resources and Stress

206
207 The Friedrich Short-Form of the QRS (Friedrich, Greenberg, & Crnic, 1983) is a 52-item, self-
208 administered, true or false, tool, designed to measure parental perceptions of the impact of a
209 developmentally delayed, or chronically ill, child on other family members. The QRS-F consists
210 of four sub-scales, which assess parental perceptions about: *Parent and Family Problems*, dealing
211 with the impact that the disability has on family activities or relationships; *Pessimism*, related to
212 parent depression; *Child Characteristics*, dealing with the impact of the child's problems on the
213 family; and *Physical Incapacity*, which examines the family problems produced by the child not

213
214 being able to perform certain activities for themselves. These scores summate to produce a *Total*
215 *Stress Score* (0–52). Higher scores are indicative of greater perceived stress within the family, as
216 perceived and indicated by the parents (but not, it should be noted, of a greater degree or number
217 of actual stressors, see Dyson, Edgar, & Crnic, 1989).

218 The internal reliability of the sub-scales ranges from: 0.77 (*Physical Incapacity*) to 0.85
219 (*Child Characteristics*), with the internal reliability of the *Total Stress Score* being 0.89. This tool
220 has previously been employed for samples with ASC in assessing stress in parents (e.g., Hastings
221 & Johnson, 2001), and so allows comparison with previous studies. The total stress score from
222 this scale has been shown to have good reliability and validity for research with parents of
223 children with ASC (Honey, Hastings, & McConachie, 2005).

224 225 1.2.5. Parent–Child Relationship Inventory

226 The PCRI (Gerard, 1994) is a 78-item self-administered tool to assess parents' attitudes
227 towards parenting and their parenting behaviors. The items are selected to measure a wide variety
228 of parenting dispositions and behaviors. All of the items have a Likert-type, 4-point response
229 format: *strongly agree*, *agree*, *disagree*, and *strongly disagree*. There are seven scales, which
230 each produce a standardized *T*-score (mean = 50, standard deviation = 10), where high scores
231 reflect positive orientations. The seven scales are *Parental Support*, *Satisfaction with Parenting*,
232 *Involvement*, *Communication*, *Limit Setting*, *Autonomy*, and *Role Orientation*. To check the
233 validity of the protocol, there is a five-item *Social Desirability* scale, which, if scores are low,
234 indicates that the parent responses are unrealistically positive regarding the parent–child
235 relationship.

236 Due to the fact that the current study was concerned with the impact of parenting behaviors, it
237 seemed inappropriate to examine the *Parental Support*, *Satisfaction with Parenting*, and *Role*
238 *Orientation* scales. These scales do not deal with parenting behaviors per se, but with the parental
239 perceptions of the level of emotional and social support received, the amount of pleasure and
240 fulfillment derived, and their attitudes towards gender roles, respectively. The four remaining
241 scales all dealt with parenting behaviors, and each assessed different aspects of this parenting
242 behavior. The *Involvement* scale consists of 14 items that examine the parental interaction with,
243 and parental knowledge of, their child (e.g., “*I am very involved with my child’s sports or other*
244 *activities*”, “*I spend very little time talking with my child*”). The *Communication* scale contains
245 nine items that assess the effectiveness of parental communication with their child (e.g., “*My*
246 *child generally tells me when something is bothering him or her*”, “*If I have to say no to my child,*
247 *I try to explain why*”). The *Limit Setting* scale consists of 12 items that concentrate on parental
248 disciplining of their child (e.g., “*I sometimes give in to my child to avoid a tantrum*”, “*I often lose*
249 *my temper with my child*”). The *Autonomy* scale contains 10 items that evaluate the parental
250 ability to promote independence in their child (e.g., “*I worry a lot about my child getting hurt*”,
251 “*I have a hard time letting go of my child*”).

252 The internal reliability (alpha coefficients) of the four scales used ranged from 0.76
253 (*Involvement*) to 0.88 (*Limit Setting*), and they had a mean test–retest reliability of 0.81. Also, the
254 PCRI has good correlation with other instruments that measure parenting behaviors (see
255 Coffman, Guerin, & Gottfried, 2006; Gerard, 1994). Heinze and Grisso (1996) reviewed the
256 PCRI, amongst other instruments of parenting capacity, and their results lead them to conclude
257 that the PCRI was a useful measure for child custody hearings, in abuse cases, and in divorce
258 mediations. The PCRI has been utilized in various research settings, for instance, in order to
259 assess outcome effectiveness of various interventions, such as the Family Mentoring Program,

and has been found to be a useful measure for such purposes (e.g., Baron-McKeagney, Woody, & D'Souza, 2002).

1.2.6. Strengths and Difficulties Questionnaire

The Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997) is a brief behavioral screening questionnaire for 3–16-year olds. It exists in several versions to meet the needs of researchers, clinicians, and educationalists. The parent version includes 25 items, divided between five scales, all score ranges are from 0 to 10: *emotional symptoms* (norm = 1.9), *conduct problems* (norm = 1.6), *hyperactivity/inattention* (norm = 3.5), *peer relationship problems* (norm = 1.5), and *pro-social behavior*. The first four sub-scales, when added together, generate a *total difficulties score* (norm = 8.4; score range 0–40). Scores in the *total difficulties score* between 0 and 13 are in the normal range, scores between 14 and 16 are deemed to be borderline, and scores of 17–40 are abnormal. The questionnaire correlates highly with the Rutter Child Questionnaires (Goodman, 1997).

1.3. Procedure

The children were identified by the Local Education Authorities, were contacted by the researchers, and, on choosing to participate, parental consent was received. The same tests were administered at baseline and then, again, at follow-up for all children, after a 9–10-month period. Autistic severity (GARS), intellectual functioning (BAS), and adaptive behavioral and social functioning (VABS) were measured. In addition, measures of self-reported parenting stress (QRS-F), self-reported parenting behaviors (PCRI), and the parents' assessments of the child behavior problems (SDQ) were collected.

The children were visited by an Educational Psychologist, who was blind to the levels of parenting stress, and to parenting behaviors, and the baseline child measures were taken (GARS, BAS, and VABS). Parents were contacted, at this time, and asked to complete QRS-F, PCRI, and SDQ questionnaires, and to give some background regarding their child, as well as a brief history of their child's provision, which they did independently from the researchers. The questionnaires were sent out by post to the parents, along with an information letter, and a pre-paid, addressed return envelope. The information letter provided contact details, offering parents the opportunity to seek help and guidance, if required, regarding the completion of the questionnaires, however, it was extremely rare that any parents contacted the researchers in order to ask advice about answering specific questions. On completion, the parents used this pre-paid envelope to return the questionnaires to the researchers. As an added incentive for returning this information, the parents were automatically entered into a prize draw, the winner of which received £50 for toys or books for their child. This incentive was specified in the information letter. If parents had not returned the questionnaires after a period of time, they were contacted by a researcher, via telephone, and reminded, and given the opportunity to return the completed questionnaires. After 9–10 months, all parents were asked to complete the QRS-F, PCRI, and SDQ questionnaires again, and to return them by post, as described above.

The scores from these follow-up assessments were compared with those from the baseline assessments in order to ascertain the relationship between the measures of parenting behaviors and child behavior problems over the 9–10 months period. On scoring the PCRI questionnaires, two questionnaires were found to have scores on the *Social Desirability* scale that indicated unrealistically positive depictions of their parent–child relationships (one baseline, and one follow-up). These two complete sets of PCRI scores were removed, as the *Social Desirability*

Table 1

Means (standard deviations) for child characteristics, parental stress, parenting behaviors, and child behavior problems

Measure	Baseline	Follow-up	Correlation	t-Test
Child behavior	19.9 (6.1)	18.2 (4.6)	0.680***	3.35***
Parental stress	24.4 (9.3)	21.3 (7.5)	0.642***	3.58***
Involvement	44.0 (9.7)	43.4 (6.9)	0.496***	<1
Communication	36.5 (8.9)	38.3 (6.6)	0.615***	2.10*
Limit setting	46.8 (6.7)	48.8 (5.6)	0.562***	2.87**
Autonomy	50.5 (6.1)	51.5 (7.6)	0.226	1.07

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

scale indicated that they had questionable validity, and they were replaced by mean substitutions, based on the mean of the rest of the sample.

2. Results

Table 1 shows the mean (standard deviation) for the total parenting stress (QRS-F), parenting behaviors (PCRI), and total child behavior problems (SDQ) at both baseline and at follow-up. These data at baseline show high levels of parenting stress, as measured by the QRS-F, and high levels of child behavior problems, the mean of the latter score being in the abnormal range at both baseline and at follow-up. The broad pattern of data was similar at follow-up, with all of the scores showing some improvement (i.e., less parenting stress, fewer child behavior problems, and improved scores in the parenting behavior domains). Parenting stress and child behavior problems showed statistically significant improvements, as did the *Communication* and *Limit Setting* scales for parenting behaviors. These parenting behavior scores were, however, consistent across participants, all, with the exception of the *Autonomy* scale, showed statistically significant correlations between baseline and follow-up.

Table 2 shows the correlations between the four parenting behavior scales of the PCRI and the total parenting stress score (QRS-F), and the total child behavior problems score (SDQ), at both baseline and at follow-up. These data show a reasonably consistent pattern of results across baseline and follow-up. The parenting behavior of *Limit Setting* strongly correlated negatively with parenting stress (QRS total), and also with child behavior problems (SDQ total), at both baseline and at follow-up. The *Communication* scale of the PCRI correlated negatively with parenting stress, but not with child behavior problems, at baseline and at follow-up. The *Autonomy* scale did not correlate with either parenting stress, or with child behavior problems, at either baseline or at follow-up. The one inconsistent result was that the *Involvement* scale only correlated negatively with parenting stress at baseline, and only with child behavior problems at

Table 2

Correlations between stress and child behavior problems and parenting behaviors at baseline and follow-up

	INV	COM	LIM	AUT
Parental stress	-0.434***	-0.424***	-0.552***	-0.018
Child problems	-0.143	-0.115	-0.545***	-0.151
Parental stress	-0.094	-0.257*	-0.427***	-0.124
Child problems	-0.306***	-0.130	-0.422***	0.068

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

Table 3

Q7 Semi-partial, time-lagged correlations between parenting behaviors (PCRI) at baseline and child behavior problems (SDQ) at follow-up, and child behavior problems at baseline and parenting behaviors at follow-up (with autistic severity, intellectual functioning, and parenting stress partialled out)

Parenting behavior	Parenting to child problems	Child problems to parenting
Involvement	-0.126	-0.207
Communication	0.008	0.034
Limit setting	-0.333***	-0.175
Autonomy	-0.043	0.029

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$.

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327

328 follow-up. Parenting stress correlated positively with child behavior problems at both baseline, $r = 0.515$, $p < 0.001$, and at follow-up, $r = 0.525$, $p < 0.001$.

329

330

331 Table 3 presents the results from a series of semi-partial, time-lagged correlations between
332 parenting behaviors (PCRI) at baseline and child behavior problems (SDQ total score) at follow-up,
333 removing the influences of the three child characteristics; namely, autistic severity (GARS
334 overall), general cognitive ability (BAS), and adaptive behavioral functioning (VABS
335 composite). Semi-partial correlations were performed, in preference to examining the
336 standardized beta coefficients from a multiple regression, as the predictor variables were
337 correlated with one another, and, in these circumstances, standardized beta coefficients are not an
338 appropriate estimate of the individual contribution of predictor variables (Darlington, 1990;
Howell, 1997). Moreover, semi-partial correlations are a more conservative, and cautious,

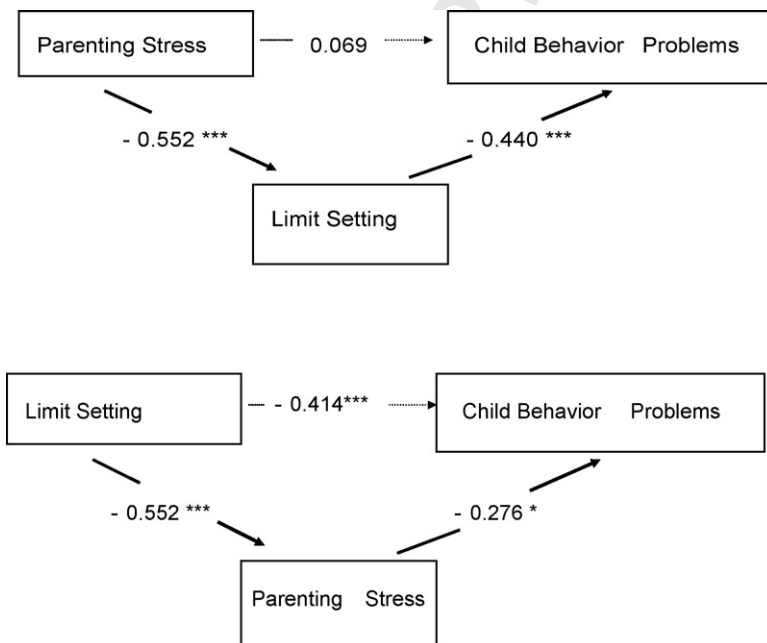


Fig. 1. Mediation analysis of the relationship between baseline limit setting, baseline parental stress and follow-up child behavior problems.

estimate of the relationship than are partial correlations, and are to be preferred for this reason (Tabachnick & Fidell, 1989). These correlations were conducted to establish whether there were any indications of temporal precedence, and directionality, between parenting behaviors and child behavior problems. Of these semi-partial, time-lagged correlations, only that between *Limit Setting* at baseline and child behavior problems at follow-up was statistically significant.

Fig. 1 shows the results of two mediational analyses conducted on these data. The relationship between parenting stress, *Limit Setting* (as the only important parenting behavior established above), and child behavior problems was analyzed, as suggested by Miles and Shevlin (2001). The top panel of Fig. 1 shows that there were significant negative relationships between parenting stress and *Limit Setting* at baseline, and between *Limit Setting* at baseline and child behavior problems at follow-up. However, when *Limit Setting* was used as a mediator of the relationship between parenting stress at baseline and child behavior problems at follow-up, this direct relationship virtually disappeared. In contrast, when parenting stress was used as a mediator of the relationship between *Limit Setting* at baseline and child behavior problems at follow-up, there remained a strong relationship between these two variables.

3. Discussion

The current research aimed to explore the relationship between parenting behaviors in parents of children with ASC, and child behavior problems. Such a link has been suggested a number of times in the theoretical literature (e.g., Deater-Deckard, 1998; Hastings, 2002), but, so far, there has been little empirical evidence to support it, especially in regard to ASC. There was a relationship between parenting behaviors and subsequent child behavior problems, but only for the parenting behavior of limit setting. The better the limit setting of the parents at baseline, the fewer child behavior problems were noted at follow-up. Finally, the parenting behavior of limit setting was found to mediate the relationship between parenting stress and subsequent child behavior problems.

It has been suggested that parenting behaviors will be linked to child behavior problems (e.g., Deater-Deckard, 1998; Hastings, 2002). This is not an unreasonable claim, although there is surprisingly little empirical evidence to support it. There have been some demonstrations of this link in the general population (e.g., Ehrensaft et al., 2003; Fenning et al., 2007), but this present research was the first demonstration of a clear link, in a sample of children with ASC and their parents, that showed that this link was not impacted upon by other factors (such as the severity of the child's ASC, the child's intellectual functioning, or the parents' levels of parenting stress).

Moreover, the current study used a longitudinal design, which allowed the temporal precedence, and directionality, of this link between parenting behaviors and child behavior problems to be established. In this regard, the current study found that limit setting by parents at baseline was associated with fewer child behavior problems at a later point in time. To this extent, the present research is one of the first studies to give some empirical support to theoretical models of parenting, especially in a population with a developmental disability, like ASC. The particular parenting behavior that appears to be of uppermost importance, in this regard, is that of limit setting (i.e., greater parental limit setting → fewer child behavior problems).

This finding that earlier effective limit setting by parents is the best predictor of fewer later behavior problems in children with ASC is a simple, but, nevertheless, interesting result. It corroborates similar findings from a range of other samples of children (e.g., Austin et al., 2004; Ehrensaft et al., 2003), regarding the importance of behavior management strategies, monitoring children's behaviors, and parental confidence in providing discipline. It should be mentioned that this finding does not conflict with claims that parental 'warmth' and 'responsiveness' are

important characteristics, and that harsh discipline parenting styles are counter-productive (Fenning et al., 2007). Firstly, limit setting is not necessarily at odds with a ‘warm’ parenting style, and secondly, it is unclear how such attitudes in the parents as ‘warmth’ would directly impact on children with ASC, if not through parenting behaviors. The importance of limit setting, in the context of this sample with ASC, may have wider implications for the prevention of behavior problems in children in other educational and family settings.

This finding of a relationship between parenting behavior and subsequent child behavior problems may provide a mechanism as to how high parenting stress produces more extreme child behavior problems (Lecavalier et al., 2006; Osborne & Reed, submitted for publication-a), and also poorer child outcomes resulting from undergoing teaching intervention programs (Osborne et al., submitted for publication; Robbins et al., 1991). It may be that, if parenting stress impacts on parenting behaviors, which the current study evidentially demonstrated (see also Osborne & Reed, submitted for publication-b), and, if these parenting behaviors impacted on child behavior problems, then this would provide a channel or route via which parenting stress could impact on child behavior problems and child outcomes in children with ASC. The limited literature to date does suggest that parenting stress can impact on parenting behaviors (e.g., Kotchick et al., 2005; Meyers & Miller, 2004; Osborne & Reed, submitted for publication-b), and that parenting behaviors can impact on child behavior problems (Ehrensaft et al., 2003; Fenning et al., 2007, as well as the current study), and on child outcomes (Osborne et al., submitted for publication; Robbins et al., 1991).

Taken together, the above studies support a number of theoretical models of parenting behaviors. However, the current research also demonstrated, through mediational analyses, that parenting behaviors mediated the effects of parenting stress on subsequent child behavior problems, but that parenting stress did not greatly affect the impact of parenting behaviors. These data also support the above suggestions regarding theoretical models of parenting, although they should be treated with some caution for two reasons. Firstly, previous studies have found a direct link between parenting stress and child behavior problems (Anthony et al., 2005; Blader, 2006), although not in a sample of children with ASC. Given that one of the core definitional and diagnostic characteristics of ASC is a difficulty with accurately interpreting emotional states in others (e.g., Hobson, Ouston, & Lee, 1989), this difference between the present study and those studies of Anthony et al. (2005), and Blader (2006), may not be surprising. Secondly, a mediational analysis that studied parenting stress, parenting behaviors, and child behavior problems at three time points, instead of the current two, would add significantly to this analysis. However, given that previous work has established a bi-directional interaction between parenting stress and parenting behaviors, in a sample of parents of children with ASC (Osborne & Reed, submitted for publication-b), then there is evidence to support such a temporal relationship, independent of the present study.

In terms of the implications, and practical applications, of these current findings for the intervention and treatment of ASC, focusing purely on the impact of any intervention or treatment neglects the important role that parents play in the management of their child’s behavior problems and difficulties. The present findings suggest that intervention programs that focus on providing parents with behavior management skills (e.g., Harris et al., 2000; Lovaas & Smith, 2003) will have benefits for both the child and the parents. However, it is clear that interventions should also focus on the reduction of parenting stress at their commencement, as this may allow development of better parenting behaviors and skills subsequently. Numerous intervention programs target the parents of children with ASC, and have noted improvements in the children’s behaviors, and functioning, as a result of the parents’ reduction in stress, and their increase in coping ability (see Blacher et al., 2005, for a review).

There are several limitations to the present research that should be mentioned. The current study was conducted on a relatively older sample of children (5–16 years old). The results may not be the same in a younger sample of children with ASC. For example, in a younger sample of children with ASC, the parenting stress is affected by different variables than in an older sample (e.g., autistic severity has a greater impact on parenting stress in parents of younger children with ASC than it does in parents of older children with ASC; Dumas, Wolf, Fisman, & Culligan, 1991; Eisenhower et al., 2005; Hastings & Johnson, 2001; Lecavalier et al., 2006; Osborne & Reed, submitted for publication-a). Therefore, the generalizability of the current study needs to be treated with caution. An older sample of children with ASC was employed in the current study, as it was thought that, in such older children, the relationship between levels of parenting stress and parenting behaviors may have had time to settle and develop, whereas the relationship between these factors may well be in greater flux in parents of a younger sample of children with ASC.

There are a couple of additional limitations to this study that also should be mentioned. Firstly, of course, caution needs to be used when extrapolating from any particular sample to the whole population of parents of children with ASC. It may be that parents who volunteer for such research studies display different characteristics to those who do not volunteer. However, self-selection of participants is a limitation and difficulty of all such community-based studies, and this problem is not specific to this particular research. It should be mentioned that very few of the identified families refused to participate, suggesting that self-selection was not a major problem in this study. Secondly, the measure of parenting behaviors used was a self-report measure, albeit a well-standardized, reliable, validated, and widely used measure. Further research that employs a range of additional measures of these parenting behaviors and child behavior problems would help to corroborate and systematically replicate the current findings. Additionally, direct observation could help to corroborate these findings, although this approach would severely limit the sample size, relative to the methods employed in this research.

In summary, the current findings are some of the first to demonstrate that parenting behaviors directly impact on subsequent child behavior problems in children with ASC, and that this relationship appears to mediate the impact of parenting stress on child behavior problems. It is certainly not suggested that ASC is caused by parenting behaviors, nor by parenting stress, but that helping parents to manage their parenting style and parenting behaviors, as well as their parenting stress, may enhance their management of their child's behavior problems. The parents should be included in any intervention program or treatment designed to address the difficulties experienced by children with ASC.

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