

Title: Do maternal attributions play a role in the acceptability of behavioural interventions for problem behaviour in children with autism spectrum disorders?

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## **Abstract**

The present study explored the relationship between parental attributions and treatment acceptability of behavioural interventions for problem behaviour in children with autism spectrum disorders (ASD). Mothers of children with ASD aged 3 to 9 years ( $N = 139$ ) completed survey measures that assessed demographics, parental attributions, treatment acceptability of parent-focused and child-focused behavioural interventions, severity of their child's disruptive behaviour, and severity of their child's ASD symptoms. The results showed that parental attributions of parent-referent stability, but not the other attributional dimensions, negatively predicted treatment acceptability of a parent-focused behavioural intervention, even when severity of disruptive behaviour was statistically controlled. Conversely, no associations were found between any attributional dimension and treatment acceptability of a child-focused behavioural intervention. Preliminary analyses also revealed that mothers' ratings of the severity of their child's disruptive behaviour were significantly negatively associated with the acceptability of both parent-focused and child-focused behavioural interventions. The findings have potential implications for professionals to identify and challenge distorted attributions of parent-referent stability to promote parental acceptance of a parent-focused behavioural intervention for problem behaviour in children with ASD.

*Keywords:* treatment acceptability, attributions, behavioural intervention, problem behaviour, autism

# **Do maternal attributions play a role in the acceptability of behavioural interventions for problem behaviour in children with autism spectrum disorders?**

## **1. Introduction**

### **1.1. Problem behaviour in children with autism spectrum disorders**

Children with autism spectrum disorders (ASD) are at an increased risk of exhibiting a wide range of externalising problem behaviour (Canitano & Scandurra, 2008; Cohen, Yoo, Goodwin, & Moskowitz, 2011; Singh, Lancioni, Winton, & Singh, 2011). Examples of these problem behaviours include hyperactivity, self-injury, and a group of disruptive behaviours consisting of aggression, property destruction, tantrums, rule breaking, and noncompliance (e.g., Hagopian, 2007; Horner, Carr, Strain, Todd, & Reed, 2002; Lecavalier, Aman, Hammer, Stoica, & Mathews, 2004; Matson, 2009; O'Reilly et al., 2009; Reese, Richman, Zarcone, & Zarcone, 2003; Reese, Richman, Belmont, & Morse, 2005; Roberts & Pickering, 2010). Researchers have suggested that problem behaviour may not only have negative consequences on a child's overall development but also create significant challenges to the child's parents and other family members (McCracken et al., 2002; West & Waldrop, 2006). Given that problem behaviour is likely to persist and become chronic without appropriate intervention (Khosroshahi, Pouretemad, & Khooshabi, 2010; Murphy et al., 2005), this highlights the importance of interventions for addressing problem behaviour in children with ASD.

One of the most widely used evidence-based interventions for alleviating problem behaviour in children with ASD is behavioural interventions based on operant conditioning principles (Boyd, McDonough, & Bodfish, 2011; Bregman, Zager, & Gerdts, 2005; Campbell, 2003; Green et al., 2006; Horner et al., 2002; Myers & Johnson, 2007). In particular, within the range of these interventions that aim to reduce problem behaviour, there appears to be a shift from child-focused behavioural interventions, which are typically carried out by trained therapists to focus exclusively on teaching the target child (e.g., early intensive behavioural intervention [EIBI] programmes), towards an increasing recognition of parent-focused behavioural interventions, which are provided to train parents in the use of appropriate behavioural strategies with their child (e.g., the Stepping Stones Triple P [SSTP] programme) (e.g., Birkin, Anderson, Moore, & Seymour, 2004; Brookman-Frazee, Stahmer, Baker-Ericzén, & Tsai, 2006; Brookman-Frazee, Vismara, Drahota, Stahmer, & Opendeden, 2009; Francis, 2005; Matson, Mahan, & Matson, 2009; Schreibman, 2000; Schreibman & Anderson, 2001). This increasing availability of parent-focused behavioural interventions, in turn, serves to highlight the greater role that parents of children with ASD play not only in seeking assistance and deciding which interventions to use, but also in actively learning, implementing, and delivering the interventions themselves. Hence, promoting parental acceptability of behavioural interventions will have increasing value for professionals supporting children with ASD.

## **1.2. Treatment acceptability and parental attributions**

Treatment acceptability is defined as “judgments by laypersons, clients, and others of whether treatment procedures are appropriate, fair, and reasonable for the problem or client” (Kazdin, 1981, p. 493). The conceptual foundation of treatment acceptability largely originates from Wolf’s (1978) work on social validity. Wolf coined the term *social validity* to refer to the social importance of an intervention, which is conceptualised as encompassing three related levels: (a) the social significance of the treatment goals, (b) the social appropriateness of the treatment procedures, and (c) the social importance of the treatment effects (Boothe & Borrego, 2004; Carter, 2010; Finn & Sladeczek, 2001; Jones, Eyberg, Adams, & Boggs, 1998; Wolf, 1978). Of these three levels, it is the second component of Wolf’s conceptualisation (i.e., the appropriateness of treatment procedures) that has dominated the focus of social validity research and contributed to the conceptual development of treatment acceptability (Carter, 2010; Finn & Sladeczek, 2001).

Although identifying the evidence base for an intervention is pivotal, treatment acceptability is suggested as another important criterion which plays a critical role in the success of an intervention (Calvert & Johnston, 1990; Carter, 2007, 2010; Elliott, 1988; Kazdin, 1980, 2000). In particular, researchers have argued that interventions that are viewed as more acceptable may be more likely to be selected, initiated, and adhered to than interventions rated as less acceptable (Kazdin, 1980; Miltenberger, 1990; Witt & Elliott, 1985). Regardless of its possible effectiveness, it is possible that an evidence-based intervention that is perceived as unacceptable may not be implemented with fidelity or even selected in the first place by its potential consumers (Kazdin, 1980; Kazdin, French, & Sherick, 1981).

Most of the research literature on treatment acceptability has focused on identifying the factors that are associated with treatment acceptability (see Calvert & Johnston, 1990; Elliott, 1988; Miltenberger, 1990 for reviews). Factors that may influence parental acceptability of behavioural interventions for their child’s problem behaviour include treatment characteristics (e.g., type of behavioural procedures and treatment side effects) and child characteristics (e.g., severity of problem behaviour and age of child) (Jones et al., 1998; Norton, Austen, Allen, & Hillton, 1983; Pickering & Morgan, 1985; Reimers, Wacker, Cooper, & de Raad, 1992; Singh, Watson, & Winton, 1987). Additionally, the characteristics of parents, such as income level and understanding of intervention, have also been found to influence their acceptability of behavioural interventions (Gage & Wilson, 2000; Heffer & Kelley, 1987; Kelley, Grace, & Elliott, 1990). Several researchers have argued that some parent characteristics, such as parental cognitions, may be more readily subject to modification than other factors, highlighting the benefits of addressing the relations of these parental cognitions to treatment acceptability (Hoza et al., 2006; Kazdin, 2000; Mah & Johnston, 2008).

Parental attributions have been suggested as one of these parental cognitions (Hoza, Johnston, Pillow, & Ascough, 2006; Mah & Johnston, 2008; Morrissey-Kane & Prinz, 1999). In this domain, parental attributions refer to the causal explanations parents make about their child’s behaviour

(Whittingham, Sofronoff, Sheffield, & Sanders, 2008, 2009). Based on Weiner's (1980, 1985, 1986) three-dimensional approach, there are three attributional dimensions of perceived causality: locus or internality (internal–external), controllability (controllable–uncontrollable), and stability (stable–unstable). Specifically, parental attributions can be divided into child-referent attributions concerning parents' attributions about the child's role in causing the behaviour, and parent-referent attributions concerning parents' attributions about their own role in causing their child's behaviour (Johnston & Freeman, 1997; Joiner & Wagner, 1996; Morrissey-Kane & Prinz, 1999). In line with these views, a conceptual framework regarding the role of parental attributions in treatment engagement proposed by Morrissey-Kane and Prinz (1999) suggests that parents would spontaneously make child-referent and parent-referent attributions for their child's problem behaviour: Child-referent attributions of high internality, high controllability, and high stability, and parent-referent attributions of low internality, low controllability, and high stability are considered to be negative parental attributions that are associated with poor parental engagement in the treatment process for their child (Morrissey-Kane & Prinz, 1999). Explanations of each of the attributional dimensions are summarised in Table 1. For example, a mother may think that her child's problem behaviour was due to the child's stubbornness, wherein she perceived stubbornness as an internal, controllable, and stable child-related cause and an external, uncontrollable, and unstable parent-related cause. Nevertheless, it should be noted that individuals' perceptions of causes along the attributional dimensions may vary greatly between people (Weiner, 1985).

Table 1

*Explanations of Attributional Dimensions of Child-referent and Parent-referent Parental Attributions*

Attribution Dimensions	Explanation
<i>Child-referent Parental Attributions</i>	
Child-referent Internality	The degree to which the causes are internal to the child (i.e., personality, disposition vs. the situation)
Child-referent Stability	The likelihood of the child-related causes persisting with time (i.e., enduring vs. temporary)
Child-referent Controllability	The degree to which the child can control the behaviour (i.e., purposeful, controllable vs. unintentional, uncontrollable)
<i>Parent-referent Parental Attributions</i>	
Parent-referent Internality	The degree to which the causes are internal to the parent (i.e., parent caused, accidentally or deliberately vs. unrelated to parent behaviour)
Parent-referent Stability	The likelihood of parent-related causes persisting with time (i.e., enduring vs. temporary)
Parent-referent Controllability	The degree to which the parent can control the behaviour (i.e., controllable vs. uncontrollable)

*Note.* Adapted from “Do parental attributions affect treatment outcome in a parenting program? An exploration of the effects of parental attributions in an RCT of Stepping Stones Triple P for the ASD population,” by K. Whittingham, K. Sofronoff, J. Sheffield, and M. R. Sanders, 2009, *Research in Autism Spectrum Disorders*, 3, p. 131. Copyright 2008 by Elsevier Ltd.

An increasing number of researchers have begun to consider the specific role parental attributions may play in parental acceptability of an intervention proposed for their child (e.g., Hassall & Rose, 2005; Hoza et al., 2006; Mah & Johnston, 2008; Thornton & Calam, 2011; Williford, Graves, Shelton, & Woods, 2009). In particular, some researchers highlight a hypothesised relationship between parental attributions and treatment acceptability of parent-focused behavioural interventions for children’s problem behaviour, in which parents who perceive the causes of the behaviour as being unrelated to any parental influences (e.g., child’s disposition) are less likely to judge those interventions as acceptable (Hoza et al., 2006; Mah & Johnston, 2008). It is hypothesised that a mismatch between certain parental attributions and the implicit attributional nature of parent-focused behavioural interventions (i.e., its key objective of improving parenting behaviour by using more appropriate behavioural strategies with their child) may lead to low treatment acceptability of the interventions (Mah & Johnston, 2008; Thornton & Calam, 2011).

There are several empirical studies which have examined this hypothesised relationship between parental attributions and treatment acceptability. In a study by Reimers, Wacker, Derby, and Cooper (1995), parental attributions of the physical causes for their child’s problem behaviour (e.g.,

child's health problems) were generally found to be negatively associated with their acceptability of parent-focused behavioural strategies recommended for their child. More recently, Williford et al. (2009) asked mothers of preschool children to report their child-referent attributions of their child's problem behaviour and their acceptability ratings of different interventions, including child social skills training and behaviourally based parent training. In particular, the measure of parental attributions provided an overall composite score of a child-referent internality, stability, and globality (i.e., specific–general). The results revealed that the mothers who reported an overall pattern of more negative child-referent attributions (i.e., greater composites of child-referent internality, stability, and globality) were more likely to view the child-focused social skills training as acceptable. No significant relationships however, were found between parental attributions and treatment acceptability of parent training. Nonetheless, Williford et al. argued that this lack of relationship may be due to the overall high acceptability ratings of parent training reported by the mothers.

Furthermore, in a sample of mothers of children with ADHD, Johnston, Mah, and Regambal (2010) examined the relationship between parental attributions and treatment acceptability of a brief behavioural parent training (BPT) session for their child's ADHD-related problem behaviour. They found that mothers who reported an overall pattern of more negative child-referent attributions (i.e., greater composites of child-referent internality, controllability, globality, and stability) were more likely to report high acceptability of parent-focused behavioural strategies (Johnston et al., 2010), even after controlling for other variables such as severity of inattentive symptoms. Nevertheless, similar to Williford et al. (2009), it is noteworthy that the measures of parental attributions used in Johnston et al.'s (2010) study only allowed an examination of an overall pattern of parental attributions, and thus it is unclear which attributional dimension was related to treatment acceptability. Amongst parents of children with ASD, Whittingham, Sofronoff, and Sheffield (2006) also conducted a study to explore the association between parental attributions and treatment acceptability of parent-focused behavioural strategies. The findings revealed no significant relationship between parents' ratings of treatment acceptability and their child-referent attributions of internality, controllability, and stability. However, it should be noted that Whittingham et al. (2006) assessed treatment acceptability only with a single-item scale in their study.

### **1.3. Rationale and aims of the present study**

Given the high prevalence of problem behaviour in children with ASD and the increasing availability of parent-focused behavioural interventions, an understanding of the relationship between parental attributions and treatment acceptability of behavioural interventions is particularly relevant for the ASD population. For instance, such an understanding may help to clarify whether certain parental attributions may act as a potential barrier or a catalyst to the acceptance of a parent-focused behavioural intervention, which may in turn affect the likelihood of it being selected, implemented with fidelity, and potentially, producing more beneficial outcomes. To date however, there is limited

research exploring the relationship between parental attributions and treatment acceptability of behavioural interventions amongst parents of children with ASD. It should also be noted that the existing empirical studies have revealed some inconsistent findings and are limited by methodological issues.

The main purpose of the present study was to explore the relationship between parental attributions and treatment acceptability of behavioural interventions for problem behaviour in children with ASD. To examine this relationship, disruptive behaviour of children with ASD was identified as the target problem behaviour. Unlike other forms of problem behaviour that may typically be defined as ASD-related behaviour (e.g., repetitive or stereotypical behaviour), disruptive behaviour is not necessarily related to the child's ASD condition (Reese et al., 2005). It is therefore expected that parental attributions of their child's disruptive behaviour are more likely to reflect their parental attributional style without the influence of an apparent ASD-related cause. Also, as disruptive behaviour can create particular challenges for parents (Birkin et al., 2004; McCracken et al., 2002; Shea et al., 2004; West & Waldrop, 2006), interventions are very likely to be required to address this group of behaviours. Furthermore, to provide a more complete picture of the potential relationship between parental attributions and treatment acceptability, both parent-focused and child-focused behavioural interventions were examined. It was hoped that this would allow an examination of whether certain attributional dimensions may be related to lower acceptability of parent-focused behavioural interventions but higher acceptability of child-focused behavioural interventions.

Additionally, the present study aimed to examine the relationship between parental attributions and treatment acceptability using a more rigorous research design. Specifically, this study was designed to explore how each attributional dimension of both child-referent and parent-referent attributions may be related to parents' acceptability judgements. Also, as there are other factors that may operate to influence parents' treatment acceptability, this study aimed to examine the relationship between parental attributions and treatment acceptability, whilst controlling for some of these potentially confounding variables. The variables that were found to be associated with treatment acceptability and were eligible to be controlled for in this study included family income level, age of child, prior treatment experience, severity of the child's disruptive behaviour, and severity of the child's ASD symptoms.

## **2. Materials and Method**

### **2.1. Participants**

A community sample of mothers of a child with a formal diagnosis of ASD between the ages of 3 and 9 years living in the United Kingdom (UK) were invited to participate in the present study. To be included in the sample, mothers had to report (a) they had a child with ASD aged 3 to 9 years, (b) the age at which their child was diagnosed with ASD, (c) that their child was formally diagnosed

with ASD by a registered health professional (e.g., psychiatrist or paediatrician), and (d) the actual diagnosis of their child on the autism spectrum.

The first author contacted a wide range of organisations providing support for children diagnosed with ASD in the UK, including local autistic societies, parent support groups, schools, and charities, to seek permission to advertise the research information to parents. For those organisations that provided permission, the research information was forwarded to parents either through electronic mailing lists or through posting a paper copy of the study advert to them. Potential participants were also recruited via the Internet, whereby notices were posted about the present study on the National Autistic Society (NAS) website, websites of local autistic societies, and web discussion forums for parents of children diagnosed with ASD.

Potential participants were given the option to take part through completing the survey materials online or on paper. A total of 140 participants completed the survey online and 13 participants completed the survey on paper. Fourteen participants ( $n = 13$  completed online and  $n = 1$  completed on paper) were excluded from data analyses as they did not meet the above inclusion criteria. Thus, the final study sample consisted of 139 participants who were all biological mothers of their child with ASD. The mean chronological age of the mothers was 38.31 years ( $SD = 6.11$ ), with an age range between 22.50 years and 49.42 years. Their child ranged in age from 3.00 years to 9.92 years ( $M = 6.78$ ,  $SD = 1.89$ ). A list of other demographic information is presented in Table 2.

Table 2

*Demographic Information*

	<i>n</i>	<i>%</i>
<i>Household</i>		
Single-parent household	30	21.6
Two-parent household	109	78.4
<i>Ethnicity</i>		
White British	125	89.9
Any other White background	8	5.8
Other	6	4.2
<i>Home region</i>		
South East England	75	54.0
North West England	19	13.7
South West England	18	12.9
East Midlands	10	7.2
West Midlands	6	4.3
London	4	2.9
Northern Ireland	2	1.4
Scotland	2	1.4
East of England	1	0.7
Wales	1	0.7
Yorkshire and the Humber	1	0.7
<i>Annual household income</i>		
Less than £10,000	12	8.6
£10,000-£19,999	22	15.8
£20,000-£29,999	25	18
£30,000-£49,000	36	25.9
£50,000-£74,999	26	18.7
More than £75,000	8	5.8
Not reported	10	7.2
<i>Highest level of education of mother</i>		
Primary education	2	1.4
Secondary education	20	14.4
Post-secondary education	47	33.8
Undergraduate degree	54	38.8
Postgraduate degree	16	11.5
<i>Prior treatment experience of mother</i>		
Parent-focused behavioural interventions	49	35.3
Child-focused behavioural interventions	10	7.2
<i>Child gender</i>		
Boy	115	82.7
Girl	24	17.3
<i>ASD diagnosis of child</i>		
Autistic disorder or childhood autism	93	66.9
Asperger's syndrome or high functioning autism	42	30.2
PDD-NOS or atypical autism	4	2.9

Note. ASD = autism spectrum disorders; PDD-NOS = pervasive developmental disorder not otherwise specified.

## **2.2. Materials**

### **2.2.1. Demographic questionnaire**

A demographic questionnaire was administered to gather information about the participants, including their age, ethnicity, highest level of education, income level, household information, home region, relationship to child, age of child, and gender of child. Information about the child's diagnosis of ASD was obtained through four individual items that addressed the ASD-related inclusion criteria mentioned previously. To assess their prior treatment experience of behavioural interventions for managing their child's behaviour, participants were also asked to indicate whether they had used parent-focused behavioural interventions (e.g., the SSTR programme, the EarlyBird programme, and the Incredible Years programme) and/or child-focused behavioural interventions (e.g., EIBI programmes). This variable was coded categorically, whereby a rating of "1" or "0" was used to indicate the presence or the absence of prior treatment experience, respectively.

### **2.2.2. Parental Attribution Questionnaire (PAQ; Whittingham et al., 2008, 2009)**

The PAQ was used to assess each attributional dimension, namely child-referent internality, child-referent controllability, child-referent stability, parent-referent internality, parent-referent controllability, and parent-referent stability (See Table 1 for reference). According to Whittingham et al. (2008, 2009), the PAQ was based on Weiner's (1980) attributional theory and Morrissey-Kane and Prinz's (1999) framework. It consists of three different scenarios involving good, bad or naughty, and ASD-related behaviour.

For the purpose of this study, only the bad or naughty behaviour scenario was used. This scale involved asking participants to recall a recent example of their child's bad or naughty behaviour. It was anticipated that the example behaviour the participants would think of might vary greatly across different types of problem behaviour (e.g., ranging from stereotyped behaviour to self-injurious behaviour) and this might obscure interpretation of the findings, therefore a list of disruptive behaviour examples<sup>1</sup> was added to the scale in this study as a prompt to help parents recall an example of their child's disruptive behaviour. The disruptive behaviour examples were based on the conduct problem subscale of the Nisonger Child Behavior Rating Form (NCBRF; Aman, Tassé, Rojahn, & Hammer, 1996; Tassé, Aman, Hammer, & Rojahn, 1996) and were reviewed by a senior researcher with specialism in ASD. Based on their perceived causes of the behavioural example they identified in their own child, participants were then asked to rate their agreement with 12 attributional statements, with two statements assessing each attributional dimension, using a 5-point Likert scale (1 = *strongly disagree* and 5 = *strongly agree*). Items 2, 4, 6, 8, 10, and 12 were reverse scored. The subscale items were summed to yield a score for each attributional dimension, with higher scores

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<sup>1</sup> The disruptive behaviour examples included the following: having a tantrum, threatening people, not feeling guilty after misbehaving, hitting someone, being cruel to others, challenging adult authority, getting angry easily, getting in physical fights, destroying property, running away, having to do things own way, and violating rules.

indicating greater attributions on a dimension. According to the original publication, this scenario of the PAQ has internal consistency for each subscale ranging from  $\alpha = .61$  to  $.84$  (Whittingham et al., 2008). The internal consistency coefficients for each attributional dimension in the present study were  $.50$  for child-referent internality,  $.75$  for child-referent controllability,  $.82$  for child-referent stability,  $.52$  for parent-referent internality,  $.79$  for parent-referent controllability, and  $.86$  for parent-referent stability.

### **2.2.3. Treatment acceptability measure**

The treatment acceptability measure consisted of the case vignette, the treatment descriptions, and the Treatment Evaluation Inventory-Short Form (TEI-SF; Kelley, Heffer, Gresham, & Elliott, 1989) and was used to assess participants' acceptability of parent-focused and child-focused behavioural interventions. Copies of the case vignette and treatment descriptions are available upon request.

#### **2.2.3.1. Case vignette**

The case vignette was designed to provide a brief description of a hypothetical 9-year-old boy with ASD, exhibiting disruptive behaviour that is commonly observed in children with ASD. To further ensure the validity of the case vignette in depicting common disruptive behaviour presented by children with ASD, the case vignette was reviewed by professionals and clinicians with extensive experience in working with children with ASD. A boy character, as opposed to a girl character, was chosen for the case vignette because of the higher prevalence of ASD in boys than girls (Baird et al., 2006; Campbell et al., 2011).

#### **2.2.3.2. Treatment descriptions**

Two treatment descriptions were designed to provide a summary of the typical components of a parent-focused behavioural intervention and a child-focused behavioural intervention for managing children's problem behaviour, respectively. The treatment descriptions were based on the literature (e.g., Krain, Kendall, & Power, 2005) and were reviewed by professionals who have good knowledge of behavioural interventions, including a senior researcher and educational psychologists. The treatment descriptions were of similar length and were worded in a similar style.

#### **2.2.3.3. TEI-SF (Kelley et al., 1989)**

The TEI-SF was used to assess participants' treatment acceptability of both the behavioural interventions described. The TEI-SF consists of nine items. Each item was rated on a 5-point Likert scale (1 = *strongly disagree* and 5 = *strongly agree*). Item 6 was reverse scored. Items were summed to yield a total TEI-SF score, whereby a higher score indicates greater acceptance of an intervention. A score of 27 (range 9–45) indicates moderate acceptability of an intervention (Kelley et al., 1989).

The TEI-SF has been demonstrated to have excellent psychometric properties and to effectively discriminate between alternative interventions (Kelley et al., 1989). In the present study, the internal consistency for the TEI-SF ratings of acceptability for the parent-focused behavioural intervention and for the child-focused behavioural intervention were high ( $\alpha = .90$  and  $\alpha = .91$ , respectively).

#### **2.2.4. The conduct problem subscale of the NCBRF-Parent version (Aman et al., 1996; Tassé et al., 1996)**

The conduct problem subscale of the parent version of the NCBRF was used to assess the severity of disruptive behaviour presented by the participants' own child. The NCBRF has been demonstrated to have good construct validity in the ASD population and to contain items measuring behaviours that are commonly observed in children and adolescents with ASD (Lecavalier et al., 2004). The conduct problem subscale is composed of 16 items, including disruptive behaviour such as disobedience and temper tantrums. Items were rated on a 4-point Likert scale concerning both the frequency of occurrence and the degree to which the behaviour was a problem over the last month (0 = *Did not occur or was not a problem* and 3 = *Occurred a lot or was a serious problem*). The subscale was scored by summing the items, with a higher score indicating more severe disruptive behaviour. The internal consistency of the conduct problem subscale in the present study was high ( $\alpha = .93$ ) and thus was consistent with that found in previous research ( $\alpha = .92$ ; Lecavalier et al., 2004).

#### **2.2.5. Social Communication Questionnaire-Current version (SCQ; Rutter, Bailey, & Lord, 2003)**

The current version of the SCQ was used to measure the severity of ASD symptoms presented by the participants' own child. The SCQ is a 40-item questionnaire that enquires about behavioural characteristics related to core diagnostic features of autism (Rutter et al., 2003). It is based on the Autism Diagnostic Interview-Revised (ADI-R; Lord, Rutter, & Le Couteur, 1994) (Berument, Rutter, Lord, Pickles, & Bailey, 1999; Rutter et al., 2003). The SCQ current version specifically assesses the child's behaviour in the recent three months. Participants were asked to answer yes-or-no questions to indicate whether or not their child showed a specific symptom, with a scoring value of either "1" indicating the presence of the symptom or "0" indicating the absence of the symptom. Item 1 is not included in the scoring but is used to determine whether the child has sufficient verbal skills to score the next six language items (Items 2–7). If the child is nonverbal, the six language items are omitted. Items were summed to yield a total SCQ score, with a higher score indicating greater severity of ASD symptoms. As this would have resulted in a total possible score of 0–33 for nonverbal children and 0–39 for verbal children, the total SCQ scores were converted to average scores as the unit of measurement for the purpose of this study, whereby an average score was computed using the average score per item.

### **2.3. Procedure**

Ethical approval was obtained from the University of Southampton's Psychology Ethics Committee and Research Governance Office.

Interested participants were invited to access the survey materials by following the secure University-based web link where the electronic version of the survey materials was set up or by contacting the first author directly for a paper copy of the survey. The content of the survey materials included the opt-in consent form and information sheet, a demographic questionnaire, the PAQ, the treatment acceptability measure (i.e., the TEI-SF with the case vignette and the treatment descriptions), the conduct problem subscale of the NCBRF, the SCQ, and the debriefing statement. After providing consent to take part, participants were asked to complete the demographic questionnaire and then the PAQ. Next, participants completed the treatment acceptability measure in which they were first presented with the case vignette, then one of the two treatment descriptions, followed by the TEI-SF. After completing the TEI-SF for one intervention, participants were then asked to read another treatment description and rate the acceptability of that intervention using the TEI-SF again. The presentation of the two treatment descriptions was counterbalanced to control for order effects. To further reduce possible influences of prior treatment experience, participants were requested to regard the described intervention as a novel intervention. When completing the TEI-SF, participants were also asked to imagine that their child presented with behaviour as described in the case vignette and the described intervention was suggested as an intervention option for their child. The conduct problem subscale of the NCBRF and the SCQ were then presented, respectively.

After completing all survey measures, the participants were provided with the debriefing statement and were thanked for their involvement in the study. They were also asked whether they would like to enter a prize draw as an honorarium for their participation.

## **3. Data Analysis and Results**

### **3.1. Data inspection**

Data inspection was conducted to ensure the integrity and appropriateness of the data. Four outliers (2.90%) were identified for the TEI-SF scores of the parent-focused behavioural intervention and two outliers (1.45%) for the TEI-SF scores of the child-focused behavioural interventions. These outliers were replaced by a score equal to one unit above or below the nearest nonoutlier score (Tahachnick & Fidell, 2007). No outliers were found on other variables. All variables appeared normally distributed, with all skewness and kurtosis values within  $\pm 1$ . The dataset contained some missing values due to incomplete measures (see Table 3). All parametric assumptions were met.

### 3.2. Descriptive statistics

Means and standard deviations for measures of parental attributions, treatment acceptability of parent-focused and child-focused behavioural interventions, severity of disruptive behaviour, and severity of ASD symptoms are presented in Table 3.

Table 1

*Means and Standard Deviations for Parental Attributions, Treatment Acceptability, Severity of Disruptive Behaviour, and Severity of ASD Symptoms*

Measure (Range)	n	M	SD
PAQ (Range 2–10)			
Child-referent Internality	138	6.39	1.86
Child-referent Controllability	139	4.62	1.74
Child-referent Stability	138	6.94	1.86
Parent-referent Internality	139	4.94	1.67
Parent-referent Controllability	139	4.61	1.62
Parent-referent Stability	139	6.69	1.71
TEI-SF (Range 9–45)			
TEI-SF for Parent-focused Behavioural Intervention	138	33.70	5.51
TEI-SF for Child-focused Behavioural Intervention	138	30.64	6.19
NCBRF-Conduct Problem (Range 0–48)	138	21.43	11.49
SCQ-Current (Average Score) (Range 0–1)	134	0.57	0.20

*Note.* ns vary due to missing values. PAQ = Parental Attribution Questionnaire; TEI-SF = Treatment Evaluation Inventory-Short Form; NCBRF-Conduct Problem = the conduct problem subscale of the Nisonger Child Behavior Rating Form; SCQ-Current = the current version of the Social Communication Questionnaire.

### 3.3. Examination of covariates

To determine the advisability of including a particular variable as a covariate in later analyses, Pearson's correlations were used to explore the associations of demographic variables (i.e., income level, child's age, and prior treatment experience), severity of disruptive behaviour, and severity of ASD symptoms, with treatment acceptability ratings of the parent-focused and child-focused behavioural interventions. Any of these variables found to be significantly associated with treatment acceptability ratings were to be included as covariate(s) in the regression analyses.

The results showed that severity of disruptive behaviour was negatively associated with treatment acceptability ratings of the parent-focused behavioural intervention ( $r = -.32$ ,  $p < .001$ ) and

the child-focused behavioural intervention ( $r = -.18, p = .041$ ). No significant associations were found between income level, child's age, prior treatment experience of parent-focused behavioural interventions, or severity of ASD symptoms, and treatment acceptability of the parent-focused behavioural intervention. Similarly, with respect to treatment acceptability of the child-focused behavioural intervention, no significant associations were found for income level, child's age, prior treatment experience of child-focused behavioural interventions, or severity of ASD symptoms. Thus, only severity of disruptive behaviour was retained as a covariate in subsequent analyses.

### **3.4. Hierarchical multiple regression**

Hierarchical regression analyses were then conducted to examine the association of parental attribution variables with treatment acceptability of parent-focused and child-focused behavioural interventions, respectively, after controlling for severity of disruptive behaviour.

#### **3.4.1. Parent-focused behavioural intervention**

To conduct the hierarchical regression analysis for predicting treatment acceptability of the parent-focused behavioural intervention, severity of disruptive behaviour was entered into the model as a covariate at Step 1. All attributional dimensions were then entered simultaneously into the model at Step 2.

The final model of this hierarchical regression analysis after entry of all variables is presented in Table 4. The overall model was significant,  $F(7, 129) = 3.01, p = .006$ . According to Cohen (1988), this corresponds to a small effect ( $f^2 = .05$ ). After controlling for severity of disruptive behaviour, the combination of parental attribution variables accounted for 4.1% of the variance in the ratings of treatment acceptability. As shown in Table 4, only the attributional dimension of parent-referent stability contributed a significant unique effect ( $\beta = -.27, p = .031$ ), with greater attributions of parent-referent stability being associated with lower treatment acceptability of the parent-focused behavioural intervention. The other attributional dimensions did not significantly contribute to the model and were therefore not significant predictors of treatment acceptability of the parent-focused behavioural intervention.

Table 4

*Hierarchical Multiple Regression Analysis Predicting Treatment Acceptability of the Parent-focused Behavioural Intervention from Parental Attributions*

Variable	B	SE B	$\beta$
<b>Step 1: Control</b>			
Severity of Disruptive Behaviour	-.15	.04	-.32**
<b>Step 2: Control</b>			
Severity of Disruptive Behaviour	-.14	.04	-.28**
<b>Parental Attributions</b>			
Child-referent Internality	.24	.26	.08
Child-referent Controllability	-.04	.28	-.01
Child-referent Stability	.40	.36	.13
Parent-referent Internality	.03	.30	.01
Parent-referent Controllability	.07	.32	.02
Parent-referent Stability	-.88	.40	-.27*

*Note.*  $R^2 = .10$  for Step 1;  $\Delta R^2 = .04$  for Step 2 ( $p = .006$ ).

\* $p < .05$ . \*\* $p < .01$ .

### 3.4.2. Child-focused behavioural intervention

As with the previous hierarchical regression analysis, to examine the relationship between parental attributions and treatment acceptability of the child-focused behavioural intervention, severity of disruptive behaviour was entered at Step 1 and all attributional dimensions were entered at Step 2. The final model of this hierarchical regression analysis after entry of all variables is presented in Table 5. The overall model was nonsignificant,  $F(7, 129) = 1.61, p = .137, f^2 = .05$ . After controlling for severity of disruptive behaviour, the addition of the parental attribution variables did not significantly contribute to the prediction for treatment acceptability of the child-focused behavioural intervention.

Table 5

*Hierarchical Multiple Regression Analysis Predicting Treatment Acceptability of the Child-focused Behavioural Intervention from Parental Attributions*

Variable	B	SE B	$\beta$
Step 1: Control			
Severity of Disruptive Behaviour	-.09	.05	-.18*
Step 2: Control			
Severity of Disruptive Behaviour	-.10	.05	-.19*
Parental Attributions			
Child-referent Internality	.24	.30	.07
Child-referent Controllability	.32	.33	.09
Child-referent Stability	.81	.42	.24
Parent-referent Internality	.15	.35	.04
Parent-referent Controllability	-.25	.37	-.07
Parent-referent Stability	-.80	.47	-.22

Note.  $R^2 = .03$  for Step 1;  $\Delta R^2 = .05$  for Step 2 ( $p = .137$ ).

\* $p < .05$

## 4. Discussion

### 4.1. Summary of findings

The focus of the present study was to explore the relationship between parental attributions and treatment acceptability of behavioural interventions for problem behaviour in children with ASD. Given that this is the first study to explicitly investigate parent-referent attributional dimensions in this context, the findings provide preliminary evidence supporting the important role of parent-referent stability in the acceptability of parent-focused behavioural interventions within the ASD population. If parents perceived that the parent-related causes for their child's problem behaviour were likely to persist with time, they were less likely to find a parent-focused behavioural intervention acceptable. Following the aforementioned hypothesis suggested by other researchers (e.g., Mah & Johnston, 2008; Thornton & Calam, 2011), this relationship may stem from the mismatch between parental attributions and the implicit attributional nature of a parent-focused behavioural intervention. When parents of children with ASD perceive that the parent-related causes for their child's problem behaviour are enduring and mostly permanent, it is possible that this attributional style would fail to

match with the implicit attributional nature of a parent-focused behavioural intervention in terms of its key objective of improving future parenting behaviour (e.g., use of more appropriate behavioural strategies), thus resulting in low acceptability of the intervention for reducing their child's problem behaviour. By contrast, the remaining parent-referent attributional dimensions, internality and controllability, were not found to be significant predictors of treatment acceptability of the parent-focused behavioural intervention.

Moreover, the findings suggested that none of the child-referent attributional dimensions were associated with treatment acceptability of the parent-focused behavioural intervention. These findings are inconsistent with previous research conducted by Reimers et al. (1995) and Johnston et al. (2010). Given that the present study aimed to extend the existing research by adopting a more rigorous research design, there are several methodological differences between this study and previous studies, including the examination of each attributional dimension separately and the use of a covariate model to control for severity of disruptive behaviour. Another possible explanation for the inconsistent findings is that some previous researchers have used a composite measure of child-referent attributional dimensions. It may be that only the combination of certain child-referent attributional dimensions is associated with treatment acceptability ratings. In future research, a research design that also incorporates the measurement of the overall composite of attributional dimensions would allow this assumption to be tested.

With respect to the child-focused behavioural intervention, no associations were found between any attributional dimension and its treatment acceptability. The present findings therefore provide new insight into the existing literature that parental attributions may not play a significant role in the acceptability of child-focused behavioural interventions. It is possible that other variables may play a much greater role in their treatment acceptability, and thus further research is fundamental to identify the key variables that influence parental acceptance of child-focused behavioural interventions. For example, Tzanakaki et al. (2012) reported that variables such as empirical and anecdotal evidence of treatment effectiveness may influence mothers' decision to select a child-focused behavioural intervention, whereby their decision may be potentially relevant to the treatment acceptability construct.

Furthermore, the present findings revealed that with increasing severity of their child's disruptive behaviour, parental acceptability towards both behavioural interventions was diminished. These results extend the existing findings to the ASD population. It is possible that parents of children who display more severe problem behaviour may find it more acceptable to use more immediate and/or restrictive techniques such as medication or time-out (e.g., Frentz & Kelley, 1986; McCracken et al., 2002; Miltenberger, 1990). One plausible explanation is that parents of children with more severe problem behaviour may experience higher levels of parenting stress, and thus these parents may be more likely to find "direct" interventions (e.g., medication) more acceptable than behavioural interventions that take a relatively longer intervention period before any positive effects are noted.

Although this hypothesis remains to be tested, there is some research evidence that maternal stress is significantly predicted by the severity of problem behaviour in their child with ASD (e.g., Hastings et al., 2005; Koegel et al., 1992). Nevertheless, it is important to emphasise that the goal in this study was to control the severity of disruptive behaviour as a covariate rather than to study it. Hence, additional research is required to examine this variable further.

#### **4.2. Limitations and future research**

Certain limitations must be considered when interpreting the findings of this study. First, given the sample used in the present research, the generalisability of the findings may be limited to biological mothers of children with ASD aged 3 to 9 years. Also, the large majority of participants in this study were white British. Future research may include a more diverse sample of participants, including fathers and other caregivers of children at different ages (e.g., preadolescence) and those from ethnic minority backgrounds. An associated limitation concerns the specific focus on disruptive behaviour as the target behaviour in this study. Although this focus fits well with the purpose of the present study, there is a need for replication to determine whether the present findings hold in other types of problem behaviour (e.g., self-injurious behaviour).

Furthermore, caution is warranted in relation to the use of the PAQ in assessing parental attributions in this study. In particular, the current findings showed that some of the PAQ subscales (e.g., child-referent internality) may not be as reliable as was expected from the original publication (Whittingham et al., 2008). The small number of items for each PAQ subscale may have limited its psychometric properties. Nevertheless, for the initial exploratory purpose of this study, it was thought more appropriate to adopt a published measure of parental attributions that was specifically designed for use with parents of children with ASD and has a sound theoretical basis concerning each of the attributional dimensions. Further research is required to replicate this study using more reliable and ecologically valid methods to assess parental attributions.

Another methodological issue is that the study was based solely on the parent-reported ASD diagnostic status of their child. Future research would therefore benefit from adopting a gold-standard research diagnostic measure for ASD (e.g., ADI-R; Lord et al., 1994) to further verify a diagnosis of ASD. Additionally, it is noteworthy to mention that the cross-sectional nature of this study does not allow for determination of causality between parental attributions and treatment acceptability.

Finally, given that this was an analogue study that relied on use of a written case vignette and treatment descriptions, it is unclear to what extent it provides a true indication of the mothers' treatment acceptability of behavioural interventions in naturalistic contexts. In particular, the written materials used in the present study only provided minimal information and may not be representative of the complexity of real-life situations. Nonetheless, in an attempt to address these issues, the written materials were verified by professionals and all participants were specifically asked to complete the acceptability ratings whilst imagining that the described intervention was also proposed for their own

child. There is also research evidence supporting the correspondence between acceptability ratings assessed using analogue and naturalistic methodologies (e.g., Reimers et al., 1992). Future research replicating the present study in naturalistic conditions would however allow for more extensive consideration of this issue.

#### **4.3. Implications for practice**

The present findings have important practical implications for professionals working with parents of children with ASD. Given that children with ASD are at a heightened risk of developing problem behaviour, clinicians and allied professionals are highly likely to be involved in recommending and planning possible interventions in collaboration with the children's parents. The present findings therefore provide preliminary evidence to suggest that these professionals should be more aware of how the parent-referent stability dimension might act as a barrier to parental acceptance of a parent-focused behavioural intervention. For example, regardless of its potential empirical effectiveness, a parent who perceives the parent-related causes for their child's problem behaviour to be permanent may find a parent-focused behavioural intervention unacceptable and may decide not to select it in the first place. It may be that professionals could provide an opportunity for parents to discuss any concerns related to parent-referent stability issues when planning intervention at the consultation phase, and thus to help reduce any potentially distorted attributions of permanent parent-related causes for their child's problem behaviour. For example, some form of treatment preparation technique, such as a preparatory discussion, may be carried out to identify and challenge parents' distorted attributions of parent-referent stability for their child's problem behaviour.

Alternatively, professionals may try to identify another intervention option that parents may find more acceptable to ensure a greater probability of treatment success.

Although not the main focus of the present study, the results also highlight the negative relationship between severity of disruptive behaviour and treatment acceptability of both parent-focused and child-focused behavioural interventions. This may have potential implications for the importance of early identification of and early intervention for problem behaviour in children with ASD. That is, having identified those children presenting problem behaviour early on, behavioural interventions could be introduced to parents whilst the children's problem behaviour is not yet severe; this might promote parental acceptance and potentially better utilisation of behavioural interventions, which might in turn prevent the increasing severity of the children's problem behaviour.

#### **4.4. Concluding comments**

In conclusion, the present study is one of the first to explore the role of each attributional dimension in parental acceptability of parent-focused and child-focused behavioural interventions for problem behaviour in children with ASD, in order to clarify the possible relationship between parental attributions and treatment acceptability within this context. Findings provide initial support for the

parent-referent stability dimension as a significant predictor of low acceptability of parent-focused behavioural intervention. This highlights the value of reducing distorted attributions of parent-referent stability for enhancing acceptance of parent-focused behavioural interventions amongst parents of children with ASD. Nevertheless, taking the study limitations into account, the present results should be considered preliminary and replication of the findings in a larger and more representative sample is warranted. Future research should also continue to explore other key variables that account for greater variance in treatment acceptability of behavioural interventions, especially for child-focused behavioural interventions, so as to inform better practice for professionals.

Given the general emphasis upon evidence-based practice, it is hoped that the present findings could act as a prompt to reinforce an essential goal for professionals to develop a jointly agreed intervention plan incorporating behavioural interventions that are not only effective but also acceptable to parents for managing problem behaviour in children with ASD.

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### References

- Aman, M. G., De Smedt, G., Derivan, A., Lyons, B., Findling, R. L., & the Risperidone Disruptive Behavior Study Group. (2002). Double-blind, placebo-controlled study of risperidone for the treatment of disruptive behaviors in children with subaverage intelligence. *American Journal of Psychiatry, 159*(8), 1337-1346.
- Aman, M. G., Tassé, M. J., Rojahn, J., & Hammer, D. (1996). The Nisonger CBRF: A child behavior rating form for children with developmental disabilities. *Research in Developmental Disabilities, 17*(1), 41-57.
- Baird, G., Simonoff, E., Pickles, A., Chandler, S., Loucas, T., Meldrum, D., & Charman, T. (2006). Prevalence of disorders of the autism spectrum in a population cohort of children in South Thames: The Special Needs and Autism Project (SNAP). *The Lancet, 368*(9531), 210-215.
- Berument, S., Rutter, M., Lord, C., Pickles, A., & Bailey, A. (1999). Autism screening questionnaire: diagnostic validity. *The British Journal of Psychiatry, 175*(5), 444-451.
- Boothe, J. L., & Borrego, J. (2004). Parents' acceptance of behavioral interventions for children with behavior and communication problems. *Child & Family Behavior Therapy, 26*(2), 1-15.
- Birkin, C. Anderson, A. Moore, D. W. & Seymour, F. (2004). Evaluating the efficacy of parent-focused interventions for autism: How do we know what will work?
- Boyd, B., McDonough, S., & Bodfish, J. (2011). Evidence-based behavioral interventions for repetitive behaviors in autism. *Journal of Autism and Developmental Disorders, 41*-13.

- Bregman, J. D., Zager, D., & Gerdts, J. (2005). Behavioral interventions. In F.R. Volkmar, R. Paul, A. Klin, & D. Cohen (Eds.), *Handbook of autism and pervasive developmental disorders* (3rd ed., pp. 897-924). Hoboken, NJ: Wiley.
- Brookman-Frazee, L., Stahmer, A., Baker-Ericzén, M. J., & Tsai, K. (2006). Parenting interventions for children with autism spectrum and disruptive behavior disorders: Opportunities for cross-fertilization. *Clinical Child and Family Psychology Review*, 9(3-4), 181-200.
- Brookman-Frazee, L., Vismara, L., Drahota, A., Stahmer, A., & Opdenend, D. (2009). Parent training interventions for children with autism spectrum disorders. In J. L. Matson (Ed.), *Applied behavior analysis for children with autism spectrum disorders* (pp. 237-257). New York, NY: Springer.
- Calvert, S. C., & Johnston, C. (1990). Acceptability of treatments for child behavior problems: Issues and implications for future research. *Journal of Clinical Child Psychology*, 19(1), 61-74.
- Campbell, C. A., Davarya, S., Elsabbagh, M., Madden, L., Fombonne, E. (2011). Prevalence and the controversy. In J. L. Matson & P. Sturmey (Eds.), *International handbook of autism and pervasive developmental disorders* (pp. 25-36). New York: Springer.
- Campbell, J. M. (2003). Efficacy of behavioral interventions for reducing problem behavior in persons with autism: a quantitative synthesis of single-subject research. *Research in Developmental Disabilities*, 24(2), 120-138.
- Canitano, R., & Scandurra, V. (2008). Risperidone in the treatment of behavioral disorders associated with autism in children and adolescents. *Neuropsychiatric Disease and Treatment*. 4(4), 723-730.
- Carter, S. L. (2007). Review of recent treatment acceptability research. *Education and Training in Developmental Disabilities*, 42(3), 301-316.
- Carter, S. L. (2010). *The social validity manual: A guide to subjective evaluation of behaviour interventions*. Oxford, UK: Academic Press.
- Cohen, I. L., Yoo, J. H., Goodwin, M. S., & Moskowitz, L. (2011). Assessing challenging behaviors in autism spectrum disorders: Prevalence, rating scales, and autonomic indicators. In J. L. Matson & P. Sturmey (Eds.), *International handbook of autism and pervasive developmental disorders* (pp. 247-270). New York: Springer.
- Cohen, J. (1988). *Statistical power analysis for the behavioral sciences* (2nd ed.). Hillsdale, NJ: Lawrence Erlbaum.
- Elliott, S. N. (1988). Acceptability of behavioral treatments: Review of variables that influence treatment selection. *Professional Psychology: Research and Practice*, 19(1), 68-80.
- Finn, C. A., & Sladeczek, I. E. (2001). Assessing the social validity of behavioral interventions: A review of treatment acceptability measures. *School Psychology Quarterly*, 16(2), 176-206.
- Francis, K. (2005). Autism interventions: A critical update. *Developmental Medicine & Child Neurology*, 47(7), 493-499.

- Frentz, C., & Kelley, M. L. (1986). Parents' acceptance of reductive treatment methods: The influence of problem severity and perception of child behavior. *Behavior Therapy*, 17(1), 75-81.
- Gage, J. D., & Wilson, L. J. (2000). Acceptability of attention-deficit/hyperactivity disorder interventions: A comparison of parents. *Journal of Attention Disorders*, 4(3), 174-182.
- Green, V. A., Pituch, K. A., Itchon, J., Choi, A., O'Reilly, M., & Sigafoos, J. (2006). Internet survey of treatments used by parents of children with autism. *Research in Developmental Disabilities*, 27(1), 70-84.
- Hagopian, L. (2007). Managing problem behavior in autism. *Pediatric News*, 41(5), 43.
- Hassall, R., & Rose, J. (2005). Parental cognitions and adaptation to the demands of caring for a child with an intellectual disability: A review of the literature and implications for clinical interventions. *Behavioural and Cognitive Psychotherapy*, 33(1), 71-88.
- Hastings, R., Kovshoff, H., Ward, N., Espinosa, F., Brown, T., & Remington, B. (2005). Systems analysis of stress and positive perceptions in mothers and fathers of pre-school children with autism. *Journal of Autism and Developmental Disorders*, 35(5), 635-644.
- Heffer, R. W., & Kelley, M. L. (1987). Mothers' acceptance of behavioral interventions for children: The influence of parent race and income. *Behavior Therapy*, 18(2), 153-163.
- Hoaglin, D. C., & Iglewicz, B. (1987). Fine tuning some resistant rules for outlier labeling, *Journal of American Statistical Association*, 82(400), 1147-1149.
- Hoaglin, D.C., Iglewicz, B., & Tukey, J.W. (1986). Performance of some resistant rules for outlier labelling. *Journal of American Statistical Association*, 81(396), 991-999.
- Horner, R. H., Carr, E. G., Strain, P. S., Todd, A. W., & Reed, H. K. (2002). Problem behavior interventions for young children with autism: A research synthesis. *Journal of Autism and Developmental Disorders*, 32(5), 423-446.
- Hoza, B., Johnston, C., Pillow, D. R., & Ascough, J. C. (2006). Predicting treatment response for childhood attention-deficit/hyperactivity disorder: Introduction of a heuristic model to guide research. *Applied and Preventive Psychology*, 11(4), 215-229.
- Johnston, C., & Freeman, W. (1997). Attributions for child behavior in parents of children without behavior disorders and children with attention deficit-hyperactivity disorder. *Journal of Consulting and Clinical Psychology*, 65(4), 636-645.
- Johnston, C., Mah, J. W. T., & Regambal, M. (2010). Parenting cognitions and treatment beliefs as predictors of experience using behavioral parenting strategies in families of children with attention-deficit/hyperactivity disorder. *Behavior Therapy*, 41(4), 491-504.
- Joiner, T. E., & Wagner, K. D. (1996). Parental, child-centered attributions and outcome: A meta-analytic review with conceptual and methodological implications. *Journal of Abnormal Child Psychology*, 24(1), 37-52.

- Jones, M. L., Eyberg, S. M., Adams, C. D., & Boggs, S. R. (1998). Treatment acceptability of behavioral interventions for children: An assessment by mothers of children with disruptive behavior disorders. *Child & Family Behavior Therapy*, 20(4), 15 - 26.
- Kazdin, A. E. (1980). Acceptability of alternative treatments for deviant child behavior. *Journal of Applied Behavior Analysis*, 13(2), 259-273.
- Kazdin, A. E. (1981). Acceptability of child treatment techniques: The influence of treatment efficacy and adverse side effects. *Behavior Therapy*, 12(4), 493-506.
- Kazdin, A. E. (2000). Perceived barriers to treatment participation and treatment acceptability among antisocial children and their Families. *Journal of Child and Family Studies*, 9(2), 157-174.
- Kazdin, A. E., French, N. H., & Sherick, R. B. (1981). Acceptability of alternative treatments for children: Evaluations by inpatient children, parents, and staff. *Journal of Consulting and Clinical Psychology*, 49(6), 900-907.
- Kelley, M. L., Grace, N., & Elliott, S. N. (1990). Acceptability of positive and punitive discipline methods: Comparisons among abusive, potentially abusive, and nonabusive parents. *Child Abuse & Neglect*, 14(2), 219-226.
- Kelley, M. L., Heffer, R. W., Gresham, F. M., & Elliott, S. N. (1989). Development of a modified treatment evaluation inventory. *Journal of Psychopathology and Behavioral Assessment*, 11(3), 235-247.
- Khosroshahi, S. B., Pouretemad, H. R., & Khooshabi, K. (2010). The effect of little bird program in decreasing problem behaviors of autistic children. *Procedia - Social and Behavioral Sciences*, 5, 1166-1170.
- Koegel, R. L., Schreibman, L., Loos, L. M., Dirlich-Wilhelm, H., Dunlap, G., Robbins, F. R., & Plienis, A. J. (1992). Consistent stress profiles in mothers of children with autism. *Journal of Autism and Developmental Disorders*, 22(2), 205-216.
- Krain, A. L., Kendall, P. C., & Power, T. J. (2005). The role of treatment acceptability in the initiation of treatment for ADHD. *Journal of Attention Disorders*, 9(2), 425-434.
- Lecavalier, L., Aman, M. G., Hammer, D., Stoica, W., & Mathews, G. L. (2004). Factor analysis of the Nisonger Child Behavior Rating Form in children with autism spectrum disorders. *Journal of Autism and Developmental Disorders*, 34(6), 709-721.
- Lord, C., Rutter, M., & Le Couteur, A. (1994). Autism Diagnostic Interview-Revised: A revised version of a diagnostic interview for caregivers of individuals with possible pervasive developmental disorders. *Journal of Autism and Developmental Disorders*, 24(5), 659-685.
- Mah, J., & Johnston, C. (2008). Parental social cognitions: Considerations in the acceptability of and engagement in behavioral parent training. *Clinical Child and Family Psychology Review*, 11(4), 218-236.

- Matson, J. L. (2009). Aggression and tantrums in children with autism: A review of behavioral treatments and maintaining variables. *Journal of Mental Health Research in Intellectual Disabilities*, 2(3), 169-187.
- Matson, M. L., Mahan, S., & Matson, J. L. (2009). Parent training: A review of methods for children with autism spectrum disorders. *Research in Autism Spectrum Disorders*, 3(4), 868-875.
- McCracken, J. T., McGough, J., Shah, B., Cronin, P., Hong, D., Aman, M. G., . . . McMahon, D. (2002). Risperidone in children with autism and serious behavioral problems. *New England Journal of Medicine*, 347(5), 314-321.
- Miltenberger, R. G. (1990). Assessment of treatment acceptability. *Topics in Early Childhood Special Education*, 10(3), 24-38.
- Morrissey-Kane, E., & Prinz, R. J. (1999). Engagement in child and adolescent treatment: The role of parental cognitions and attributions. *Clinical Child and Family Psychology Review*, 2(3), 183-198.
- Murphy, G. H., Beadle-Brown, J., Wing, L., Gould, J., Shah, A., & Holmes, N. (2005). Chronicity of challenging behaviours in people with severe intellectual disabilities and/or autism: A total population sample. *Journal of Autism and Developmental Disorders*, 35(4), 405-418.
- Myers, S. M., & Johnson, C. P. (2007). Management of children with autism spectrum disorders. *Pediatrics*, 120(5), 1162-1182.
- Norton, G., Austen, S., Allen, G., & Hilton, J. (1983). Acceptability of time out from reinforcement procedures for disruptive child behavior: A further analysis. *Child & Family Behavior Therapy*, 5(2), 31-41.
- O'Reilly, M., Rispoli, M., Davis, T., Machalicek, W., Lang, R., Sigafoos, J., . . . Didden, R. (2009). Functional analysis of challenging behavior in children with autism spectrum disorders: A summary of 10 cases. *Research in Autism Spectrum Disorders*.
- Pickering, D., & Morgan, S. B. (1985). Parental ratings of treatments of self-injurious behavior. *Journal of Autism and Developmental Disorders*, 15(3), 303-314.
- Reese, R. M., Richman, D. M., Belmont, J. M., & Morse, P. (2005). Functional characteristics of disruptive behavior in developmentally disabled children with and without autism. *Journal of Autism and Developmental Disorders*, 35(4), 419-428.
- Reese, R. M., Richman, D. M., Zarcone, J., & Zarcone, T. (2003). Individualizing functional assessments for children with autism. *Focus on Autism and Other Developmental Disabilities*, 18(2), 89-94.
- Reimers, T. M., Wacker, D. P., Cooper, L. J., & de Raad, A. O. (1992). Acceptability of behavioral treatments for children: Analog and naturalistic evaluations by parents. *School Psychology Review*, 21(4), 628-643.

- Reimers, T.M., Wacker, D. P., Derby, K. M., Cooper, L. J. (1995). Relation between parental attributions and the acceptability of behavioral treatments for their child's behavior problems. *Behavioral Disorders*, 20(3), 171-178.
- Roberts, D., & Pickering, N. (2010). Parent training programme for autism spectrum disorders: An evaluation. *Community Practitioner*, 83, 27-30.
- Rutter, M., Bailey, A., & Lord, C. (2003). The Social Communication Questionnaire (SCQ) manual. Los Angeles, CA: Western Psychological Services.
- Schreibman, L., & Anderson, A. (2001). Focus on integration: The future of the behavioral treatment of autism. *Behavior Therapy*, 32(4), 619-632.
- Schreibman, L. (2000). Intensive behavioral/psychoeducational treatments for autism: Research needs and future directions. *Journal of Autism and Developmental Disorders*, 30(5), 373-378.
- Shea, S., Turgay, A., Carroll, A., Schulz, M., Orlik, H., Smith, I., & Dunbar, F. (2004). Risperidone in the treatment of disruptive behavioral symptoms in children with autistic and other pervasive developmental disorders. *Pediatrics*, 114(5), e634-641.
- Singh, N. N., Lancioni, G. E., Winton, A. S. W., & Singh, J. (2011). Aggression, tantrums, and other externally driven challenging behaviors. Prevalence and the controversy. In J. L. Matson & P. Sturmey (Eds.), *International handbook of autism and pervasive developmental disorders* (pp. 413-436). New York: Springer.
- Singh, N. N., Watson, J. E., & Winton, A. S. W. (1987). Parents' acceptability ratings of alternative treatments for use with mentally retarded children. *Behavior Modification*, 11(1), 17-26.
- Tabachnick, B. G., & Fidell, L. S. (2007). *Using Multivariate Statistics* (5th ed.). Boston: Allyn and Bacon.
- Tassé, M. J., Aman, M. G., Hammer, D., & Rojahn, J. (1996). The Nisonger Child Behavior Rating Form: Age and gender effects and norms. *Research in Developmental Disabilities*, 17(1), 59-75.
- Thornton, S., & Calam, R. (2011). Predicting intention to attend and actual attendance at a universal parent-training programme: A comparison of social cognition models. *Clinical Child Psychology and Psychiatry*, 16(3), 365-383.
- Tzanakaki, P., Grindle, C., Hastings, R.P., Hughes, J.C., Kovshoff, H., & Remington, B. (2012). How and why do parents choose early intensive behavioural intervention for their young child with autism? *Education and Training in Autism and Developmental Disabilities*, 47(1), 58-71.
- Weiner, B. (1980). A cognitive (attribution)-emotion-action model of motivated behaviour: an analysis of judgements of help-giving. *Journal of Personality and Social Psychology*, 39(2), 186-200.
- Weiner, B. (1985). An attributional theory of achievement motivation and emotion. *Psychological Review*, 92(4), 548-573.
- Weiner, B. (1986). *An attributional theory of motivation and emotion*. New York: Springer Verlag.

- West, L., & Waldrop, J. (2006) Risperidone use in the treatment of behavioral symptoms in children with children. *Pediatric Nursing*, 32(6), 545-549.
- Whittingham, K., Sofronoff, K., & Sheffield, J. (2006). Stepping Stones Triple P: A pilot study to evaluate acceptability of the program by parents of a child diagnosed with an autism spectrum disorder. *Research in Developmental Disabilities*, 27(4), 364-380.
- Whittingham, K., Sofronoff, K., Sheffield, J., & Sanders, M. R. (2008). An exploration of parental attributions within the autism spectrum disorders population. *Behaviour Change*, 25(4), 201-214.
- Whittingham, K., Sofronoff, K., Sheffield, J., & Sanders, M. R. (2009). Do parental attributions affect treatment outcome in a parenting program? An exploration of the effects of parental attributions in an RCT of Stepping Stones Triple P for the ASD population. *Research in Autism Spectrum Disorders*, 3(1), 129-144.
- Williford, A. P., Graves, K. N., Shelton, T. L., & Woods, J. E. (2009). Contextual risk and parental attributions of children's behavior as factors that influence the acceptability of empirically supported treatments. *Vulnerable Children and Youth Studies*, 4(3), 226-237.
- Witt, J. C., & Elliott, S. N. (1985). Acceptability of classroom intervention strategies. In T. Kratochwill (Ed.), *Advances in school psychology* (Vol. 4, pp. 251-288). Hillsdale, NJ: Erlbaum.
- Wolf, M. M. (1978). Social validity: The case for subjective measurement or how applied behavior analysis is finding its heart. *Journal of Applied Behavior Analysis*, 11(2), 203-214.