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Title: A Pilot Study of the Effects of a Social Pragmatic Intervention on the Communication and Symbolic Play of Children with Autism

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Abstract

The acquisition of social communication skills is a major challenge faced by children with autism. This pilot study investigated the effects of the Stronger Families Project, a social-pragmatic intervention, on the communication and symbolic abilities of sixteen children aged 2-4 years with autism. Standardised measures of the child's communication and symbolic behaviour were conducted by independent observers at a university clinic pre- and post-intervention, and parents were interviewed to determine the impact of variables such as maternal stress and competence on the child's social communication. Changes in some communication and symbolic behaviours occurred following the Stronger Families Project intervention according to parent report, however, improvements based on ratings by independent observers were not significant. Results are discussed in relation to the assessment of changes in the social communication and symbolic play of children with autism following intervention using clinical observation and parent report.

Keywords: autism, communication, symbolic play, social-pragmatic approach, family-centred intervention

Introduction

The acquisition of social communication is a major challenge faced by children with autism (Wetherby et al. 2000). Research since the 1980s has identified a number of core social communication deficits as targets for early intervention in young children with autism, specifically in the areas of joint attention, eye gaze, symbolic behaviour, and initiation of social contact (McConnell 2002; Wetherby et al. 2000). Various authors acknowledge the need to enhance social communication skills through early intervention, as they are associated with social reciprocity, which is vital for increasing productive interactions, social behaviours and social learning (Hancock & Kaiser 2002; Hwang & Hughes 2000; Siller & Sigman 2002). However, there is great variability regarding the extent to which interventions address core characteristics of social communication, as little empirical data are available (Koegel 2000; Quill 2000; Wetherby et al. 2000).

A review of the research on approaches to early intervention for young children with autism illustrates a shift from traditional behavioural, to contemporary behavioural and social-pragmatic approaches. A social-pragmatic approach emphasises child initiation, motivation and spontaneity within naturally occurring events and activities (Prizant & Wetherby 1998). Essentially, this approach focuses on enhancing social communication skills through interactions with the child's primary social partners, which take place in everyday contexts (Prizant & Wetherby 1998). Specific strategies including environmental arrangement, responsive interaction techniques, and milieu teaching are used to achieve this (Hancock & Kaiser 2002). Caregivers of children with autism are seen to be primary facilitators of their child's communication and language development, and they help early interventionists to derive individualised treatment goals based on each child's current communication strengths and needs (Prizant et al. 2000).

While there has been a shift from traditional behavioural to contemporary behavioural and social-pragmatic approaches, as yet there is no conclusive evidence to suggest the efficacy of a social-pragmatic approach over other approaches, particularly for children under 4 years of age (Dunlap 1999; Kasari 2002; Prizant & Rubin 1999). In particular, research is required which demonstrates the effects of the approach with autism-specific deficits, such as communication and symbolic behaviour. This pilot study aimed to investigate the effects of the Stronger Families Project (Rodger et al. 2004) on the communication and symbolic behaviour of young children (aged 2-4 years) with autism. A second aim of the pilot study was to explore possible correlations between change in children's communication and symbolic behaviour following intervention, and child adaptive behaviour, chronological age, maternal stress and sense of parenting competence.

Method

This pilot study used a pre-post test, quasi-experimental design to investigate changes in children's communication and symbolic behaviour as a result of the Stronger Families Project intervention. This formed part of a larger study of family-centred early intervention for children with autism (Rodger et al. 2004).

Participants

A total of 16 children, 14 males and 2 females aged between 25 and 47 months ($\bar{X} = 38.06$ months, $SD = 5.49$), and their parents participated in the study. Participants were recruited through community health, hospital and education-based, early intervention services. Children had a clinical diagnosis of autism based on the diagnostic criteria for autism specified in the DSM-IV (APA 1994).

Measures

Parent Measures

Data were collected on each parent participant in the areas of perceived stress and parenting competence levels, using the following two scales.

Parenting Stress Index (PSI) (Abidin 1995). The PSI is a 101-item assessment that was administered as a pre-test measure and consists of two factors: (1) stress resulting from parental perceptions of the child's contribution to the parent child relationship (child stress), and (2) the impact of the parental role on the parent with respect to psychological well-being, health, marital and other relationships (parental stress). A 5-point Likert scale is used to measure these dimensions, where higher scores indicate greater levels of stress.

Parenting Sense of Competence (PSOC) (Johnston & Mash 1989). The PSOC is a 16-item scale measuring parental satisfaction and efficacy and was administered both as a pre- and post-intervention measure. These dimensions are measured on a 6-point Likert scale ranging from strongly agree (1) to strongly disagree (6). Higher scores indicate greater levels of competency.

Child Measures:

Communication and Symbolic Behaviour Scales Developmental Profile (CSBS-DP)

(Wetherby & Prizant 2002). The CSBS-DP is a standardised assessment which evaluates the communication and symbolic abilities of children whose functional communication age is between 6 months and 2 years. The CSBS-DP includes two measures that were administered pre and post intervention:

1. A caregiver questionnaire which is used to obtain parents' perceptions of their child's communication and symbolic behaviour.

2. A 30 minute behaviour sample which is videotaped for later scoring. In gathering the behaviour sample, the trained evaluator uses strategies for encouraging certain behaviours from the child, including communication temptations, book sharing, pretend play, and constructive play.

Both measures consist of three component scores: social, speech, and symbolic abilities.

These three scores combine to form a Total Standard Score. The CSBS-DP shows a high degree of internal consistency and test re-test reliability.

Scales of Independent Behaviour Revised (SIB-R) (Bruininks et al. 1996). The SIB-R is administered via parent interview and provides a measure of adaptive and problem behaviours of children and adults aged from 3 months to 90 years. The SIB-R measures 14 areas of adaptive behaviour and 8 areas of problem behaviour, and includes an Early Development Form for young children and individuals whose developmental functioning is below 8 years of age.

Procedure

At pre-test, parents completed the PSOC and PSI, and their child was assessed on the CSBS-DP behaviour sample at a University of Queensland clinic. Parents were then asked to complete the CSBS-DP caregiver questionnaire and the SIB-R, after which they participated in the Stronger Families Project intervention (see Rodger et al., 2004 for details). This involved a two day parent workshop, followed by 10 sessions of individual home based early intervention. The program used a social pragmatic approach, emphasizing the functional use of communication skills in natural and semi-structured interactions. This intervention took place over approximately 6 weeks, after which the PSOC, CSBS-DP behaviour sample, and CSBS-DP caregiver questionnaire were re-administered.

Data were analysed using the Statistical Package for Social Sciences program (SPSS Version 11). Children's communication and symbolic behaviour scores, based both on a 30-minute behaviour sample and on caregiver report, were first analysed descriptively. Change in communication and symbolic behaviour from pre- to post-intervention was analysed non-parametrically using Wilcoxon's Z, due to the uneven distribution of the data. Spearman's rho was used to examine correlations between change scores on the CSBS-DP and child's adaptive functioning, chronological age, mother's level of stress, and sense of parenting competence.

Results

Table 1 presents a summary of the change in children's communication and symbolic behaviour scores from pre- to post-intervention.

Table 1 about here

Changes in communication and symbolic behaviour caregiver scores from pre- to post-intervention were found to be significant for the total score and the symbolic component, with the social component approaching significance. The caregiver score for the speech component and all scores for the behaviour sample were non-significant.

No significant relationships were found between the child and parent variables under investigation and change in behaviour sample scores (see Table 2), however a negative correlation between adaptive functioning of the child and change in caregiver total scores approached significance.

Table 2 about here

Due to the differences found between caregiver and observer ratings pre- and post-intervention, correlations between caregiver report and independent observation scores was investigated using Spearman's rho. The correlation between total behaviour sample and caregiver scores was significant ($p=0.002$) for both pre- and post-test total scores. Of the component scores, only the speech component was significant ($r = 0.783$, $p<0.001$ for pre-intervention & 0.678 , $p=0.004$ post-intervention).

Discussion

This pilot study found significant improvement in some areas of communication and symbolic behaviour following the Stronger Families Project intervention based on caregiver report as measured by the CSBS-DP. Large variability between independent observers' ratings of the same children's behaviour and the small sample size may have contributed to non-significant findings for independent observer ratings and some caregiver scores, however other explanations need to be considered.

Analysis of the assessment scores for children based on caregiver report revealed a significant improvement in the total score and the symbolic behaviour component from pre- to post-intervention. As the change in pre- to post-intervention behaviour sample scores were not significant, it may be that the intervention was unsuccessful and that change in caregiver scores resulted from caregiver bias. Previous research has found that parents can be a reliable source of information about their child's communication (Bretherton, McNew, Snyder and Bates 1983; Dale 1991). In this pilot study, however, parents played an important role in the intervention during which time they were encouraged to interact with their children using

strategies designed to promote social communication. As active participants in the intervention, parents may have been more likely to report improvement in the communication and symbolic behaviour of their children.

An alternative explanation is that parents were more able to detect subtle changes in their child's behaviour following intervention and that their scores reflected an awareness of their child's behaviour gained from observing and interacting with them at home and in the community. Unlike independent observer ratings which were based on a 30 minute behaviour sample, parent ratings were based on an overall knowledge of the child's communication and symbolic abilities in a variety of contexts. Context may be very important, as children with autism and minimal language often have context-specific communication abilities (Linfot 1994). For example, a child might request food by standing at the refrigerator door. Such contextualized communication may be missed in a clinical setting in the absence of objects familiar to the child (such as a refrigerator), particularly when attempts are made to assess small or subtle changes that may occur following intervention.

That significant improvement (based on parent report) was achieved in this pilot study following a six week intervention for children under 4 years of age was encouraging, but needs further validation given the lack of verification from independent observers. A review of comprehensive intervention studies for young children with autism found the minimum length of intervention was 12 weeks, perhaps reflecting the length of time that may be required to produce statistically significant results post-intervention (Kasari 2002). A possible line of enquiry emanating from the current pilot study is to investigate how long children and their caregivers may be involved in an intervention before a measurable change can be detected and how to measure this change. This kind of information is important to parents

who are anxious to see improvements in their child and may be encouraged by early positive feedback. Early detection of a child's responsiveness to a particular intervention can also lead to more efficient use of time and resources while maximising intervention outcomes for young children and their families.

An interesting finding from this pilot study was the trend toward greater improvement in parent reported communication and symbolic behaviour in children who had lower levels of adaptive functioning prior to intervention. An issue of great interest to researchers and clinicians alike is whether certain interventions are more effective for children with particular characteristics. By improving our knowledge in this area, we may better predict which children will need certain types of intervention (Kasari 2002).

Some caution is needed in interpreting the results from this pilot study due to the small number of participants, the absence of a control group and reliance on paediatric diagnoses of participants without confirmation using standardised instruments. The study does, however, highlight the need for further research that considers ways in which small or subtle changes in social and communication skills can be assessed. There is a risk that gains in communication and symbolic behaviours could go undetected if researchers and practitioners rely on standardized assessments alone, particularly those undertaken in clinical settings (Koegel 2000). This pilot study used the CSBS-DP caregiver questionnaire and future research will need to clarify the validity of parent report using this tool, particularly when parents themselves are directly involved in the intervention.

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Table 1. Change in children's communication and symbolic behaviour (N = 16).

CSBS DP Component	Pre Median (Range)	Post Median (Range)	Wilcoxon Z	p
Behaviour Sample Scores				
Total	74.50 (65-126)	75.00 (65-135)	1.643	0.100
Social	4.00 (3-11)	5.00 (3-15)	1.546	0.122
Speech	9.00 (3-17)	8.50 (3-17)	1.298	0.194
Symbolic	5.50 (3-13)	6.50 (3-17)	1.273	0.203
Caregiver Scores				
Total	84.50 (65-100)	90.00 (70-103)	2.693	0.007*
Social	4.00 (3-7)	5.50 (3-9)	2.384	0.017
Speech	10.00 (3-17)	10.50 (7-17)	2.015	0.044
Symbolic	7.50 (3-10)	7.00 (5-11)	2.709	0.007*

*: p<0.01.

Table 2. Correlations between communication and symbolic behaviour change scores and parent and child variables (N = 16).

Correlations	Spearman's rho	p
Behaviour Sample Change Score		
Parenting competence (PSOC)	-0.448	0.082
Child Age (months)	0.178	0.510
Adaptive Functioning (SIB-R)	0.446	0.083
Maternal Stress (PSI)	0.243	0.364
Caregiver Questionnaire Change Score		
Parenting competence (PSOC)	0.273	0.307
Child Age (months)	0.300	0.259
Adaptive Functioning (SIB-R)	-0.542	0.030*
Maternal Stress (PSI)	-0.391	0.135

*: $p < 0.05$.