**A real-world application of Social Stories as an intervention for children with communication and behaviour difficulties**

*All authors approve the submission, that this paper is their original work and is not under consideration elsewhere*

## Abstract

Increasingly, pragmatic language skills are viewed as playing a crucial role in the relationship between language and behaviour difficulties. This study aimed to explore whether Social Stories, a familiar intervention for children with autism, would lead to improvements in problematic behaviour for children with both behaviour and pragmatic language difficulties. Four children (3 male, 1 female) in Key Stage 2 and four school staff personnel in two primary schools in England were recruited to a single-case multiple-baseline design study. Direct observations were examined through visual analysis and intervention effects calculated. Generalisation and maintenance data were also collected and analysed. The Social Story intervention led to a reduction in problematic behaviour across all four participants, with intervention effect size ranging from small-medium (NAP=.58-.79). Social Stories therefore offer a promising intervention for children with pragmatic language and behaviour difficulties. Limitations of the study are discussed and directions for future research provided.

**Key Words:** Language; behaviour; school-based intervention; single-case design; Social Stories

## Introduction

### Supporting children with behaviour difficulties

The way in which behaviour difficulties are conceptualised and understood continues to evolve, reflecting shifts in psychological paradigms and special educational needs legislation (Frederickson & Cline, 2009). The United Kingdom Special Educational Needs and Disability (SEND) Code of Practice (CoP; DfE, 2015) suggests that children may display ‘challenging, disruptive or disturbing’ behaviour due to a wide range of needs, including mental health difficulties, and recommends that effective intervention involves exploration of the causes for problematic behaviour.

### Relationship between communication and behaviour

The relationship between speech, language and communication needs (SLCN) and behavioural difficulties is well-documented in the literature. Lindsay, Dockrell and Strand (2007) explored the relationship between behaviour, emotional and social difficulties (BESD) and language ability by examining the stability of BESD in children with specific SLCN between 8-12 years old and found that these children had raised levels of behavioural difficulties throughout the middle childhood period, in some cases as much as five times higher than expected according to scores on the Strengths and Difficulties Questionnaire (SDQ; Goodman, 1997).

Clegg, Stackhouse, Finch, Murphy and Nicholls (2009) found that two thirds of secondary aged pupils in the United Kingdom who were at risk of permanent exclusion were identified as having language difficulties, with one third of the sample classified as having significant and severe difficulties. Bryan, Freer and Furlong (2007) found that 62% of a sample of young offenders (n=58) had not reached Level 1 in literacy according to the criteria for National Standards for Adult Literacy and Numeracy (DfES 2001) and none scored as age equivalent on the British Picture Vocabulary Scale (BPVS-II; Dunn, Dunn, Whetton & Burley, 1997). Gregory and Bryan (2011) found similar levels of language difficulties in another study of young offenders, with 20% appearing to have severe language delay (n=73). Though the exact nature of the association between language and behavioural difficulties remains unclear, the authors argue that it is imperative to research further the implications for educational and functional communication, particularly given that the relative invisibility of language issues means they may be overlooked in comparison to presenting behaviour.

### Importance of pragmatic language

Pragmatic language relates to the way in which language is used in social interactions and includes aspects of language such as comprehension of verbal messages, coherence, conversational style and content of contributions (Adams & Bishop, 1989). Recent research has explored in more detail the role that pragmatic language ability plays in children’s emotional and behavioural development. Law, Rush and McBean (2014) found that pragmatic skills substantially mediated the relationship between language and behaviour in a sample of low socio-economic status children. A sample of boys with externalising behaviour difficulties were found to have significant pragmatic and structural language difficulties when compared to controls (Mackie & Law, 2014). In another study, children referred for Educational Psychologist involvement due to behaviour that causes concern were significantly more likely to have structural language, word decoding and pragmatic language difficulties than a matched control group (Mackie & Law, 2010).

Developing proficiency in the language necessary for understanding and engaging in social interaction is crucial. Peer relationships, in particular, appeared to be a problematic area, with studies indicating a consistent difficulty in this section of the SDQ (Lindsay et al., 2007). While there may be some overlap between populations of children with both pragmatic language difficulties and autism, there is also an identifiable diagnostic group of children for whom communication difficulties present as the primary need (Gibson, Adams, Lockton & Green, 2013; Bishop, 1998; Bishop, Snowling, Thompson & Greenhalgh, 2017). In fact, the DSM-5 introduced a new diagnostic category of Social (Pragmatic) Communication Disorder and therefore a differential diagnosis can be made against Autism Spectrum Disorder (American Psychiatric Association, 2013).

### Interventions for pragmatic language

Though researchers have explored intervention possibilities for children with both behaviour and communication difficulties, evidence for intervention effectiveness is varied and there is a continued need for well-designed studies (Law et al., 2012; Hyter, 2017). Effective intervention is a pressing consideration given that some approaches designed to tackle persistent behavioural difficulties, such as mediation and reconciliation programmes, include a demanding language component which may present additional challenges for individuals with language difficulties (Bryan et al., 2007). A review of interventions for SLCN names Social Stories as a promising intervention for pragmatic language difficulties (Law et al., 2012).

### Psychological basis for Social Stories

Social Stories were initially developed as an intervention to support children with autism spectrum disorders (ASD) to develop social cognition (Gray & Garand, 1993). Research into ASD has highlighted the difficulties individuals can face with pragmatics and the communicative intent of language, as well as perspective-taking and theory of mind (Baron-Cohen & Belmonte, 2005). The rationale for Social Stories was, therefore, to increase the amount of explicit social information available to readers in order to equip them to engage with a social situation with more understanding (Gray & Garand, 1993). Social Stories appear to facilitate a child’s understanding of their social world which, in turn, can lead to behaviour change (Toplis & Hadwin, 2006).

### Evidence base for Social Stories

Research exploring the impact of Social Stories continues to grow and there are a number of meta-analyses which synthesise and evaluate the quality of the evidence base (Sansosti, Powell-Smith & Kincaid, 2004; Ali & Frederickson, 2006; Reynhout & Carter, 2006; Kokina & Kern, 2010; Test, Richter, Knight & Spooner, 2011; McGill, Baker & Busse, 2015). There appears to be a general degree of consensus that the evidence base for Social Story effectiveness is promising but limited. Some authors highlight the practical benefits of Social Stories, such as their relative simplicity and applicability to a wide range of behaviours (Reynhout & Carter, 2006), and others note the increasing popularity of the intervention in school settings (Ali & Frederickson, 2006). However, a more cautious note is exercised in some reviews, with conclusions emphasising the low to questionable (Kokina & Kern, 2010) or highly variable (Reynhout & Carter, 2006) effects of the intervention. A recent meta-analysis indicated that Social Story interventions for children and adolescents diagnosed with ASD provided small to large effects for decreasing problem behaviours, although results varied across a range of moderating variables, including intervention setting and target behaviour (McGill et al., 2015). Further research appears necessary in order to more conclusively identify in what format and for whom Social Stories are most effective.

Previous research exploring the effectiveness of Social Stories has typically focused on populations of children with ASD. However, a small number of studies have explored the impact of Social Stories for typically developing pre-school and primary school age children and found some evidence for their impact on reducing inappropriate behaviours, such as aggression and non-compliance, as well as increasing positive peer interactions (Benish & Bramlett, 2011; Baker, 2013; Whitehead, 2007). Schneider and Goldstein (2009) explored the impact of Social Stories for three primary-aged children with diagnosed language impairments and challenging behaviours and found the intervention successfully promoted positive on-task behaviours. Toplis and Hadwin (2006) explored the use of Social Stories to change problematic lunchtime behaviour for primary school children with a behavioural SEND and found they were effective for the majority of participants, particularly those with a difficulty in perspective-taking.

### Rationale for the current research

Research on interventions to support children with pragmatic language difficulties has thus far largely concentrated on clinical populations. Adams, Lockton, Gaile, Earl and Freed (2012b) explored the impact of a manualized communication intervention for children with complex pragmatic and social communication needs and reported the factors associated with its effectiveness, such as a comprehensive assessment of need and tailoring of an intervention package, as well as availability within schools of staff for liaison and space for the intervention to take place. It seems that targeted, specialist provision can be effective for children with clinical levels of SLCN. A study which explored the impact of Social Stories for children with communication difficulties also focused on a clinical population in that participants had a diagnosed language impairment (Schneider & Goldstein, 2009).

The predominance of evidence on the impact of Social Stories concentrates on their impact with regard to children with autism and, though a small number of studies research non-ASD populations, there remains a need for further research to establish their potential efficacy as an intervention for children with other difficulties (Law et al., 2012). Studies that have been conducted with non-ASD populations tend to have methodological limitations which limit the extent to which their results can be considered meaningful. For example, Whitehead (2007) made use of a case study design and Baker (2013) employed an AB design, both of which are methodologies subject to threats to internal validity, such as history and maturation, making it difficult to establish experimental control and limiting the extent to which causal conclusions can be drawn (Barlow, Nock & Hersen, 2009). Meta-analyses of Social Story research highlight the limited availability of data related to maintenance and generalisation (Reynhout & Carter, 2006; Sansosti et al., 2004). Overall, there is a need for further high-quality research evidence to explore the effectiveness of Social Stories for children without autism.

### Summary

This study aimed to explore whether Social Stories were an effective targeted intervention for children with behaviour and sub-clinical communication needs in mainstream settings. A single-case design (SCD) was employed to explore the research question as this is a rigorous, scientific methodology that can explore treatment effects with a small sample size (Horner et al., 2005). SCD involves manipulation of an independent variable together with repeated measurement of a dependent variable before, during and after introduction of the independent variable. The systematic structure of such a design provides a strong basis for establishing causal inference (Kratochwill et al., 2010). Generalisation and maintenance data were also collected. The hypothesis for this study was that the use of a Social Story intervention would lead to reductions of problematic behaviour for children with behaviour and pragmatic language difficulties.

## Method

### Study design

Children identified by a member of school staff as having behavioural and pragmatic language difficulties were invited to participate in a Social Story (Gray & Garand, 1993) intervention in an SCD study (see Figure 1). Guidance exists about the features of an effective SCD, including a multiple-baseline structure and three demonstrations of experimental effect (Horner et al., 2005). Barlow et al.(2009) recommend using a nonconcurrent multiple baseline design across participants and randomly assigning participants to a baseline condition. A nonconcurrent baseline design, which staggers the introduction of the intervention at different points in time, adequately controls for a number of threats to internal validity, including maturation and history (Christ, 2007).

*Independent variable*

A Social Story intervention was delivered for each participant, following Gray’s (2000; 2010) guidance, which includes personalising each story to a specific target behaviour. Therefore, a Social Story was constructed about the target behaviour identified for each child.

*Dependent variable*

For this study, the target behaviour for each participant was identified in consultation with a learning support assistant (LSA) or teacher known to the child. The problematic behaviour was discussed with the child’s teacher and parent to ensure it was a behaviour that was relevant and important. As a quality indicator for SCD, Horner et al. (2005) suggest operationalising the target behaviour to be measured as the dependent variable as observable incidences. Additionally, more than one assessor should record observations so that inter-observer agreement (IOA) rates can be calculated, which should be a minimum of 80%. IOA data were collected for an average of 23% of all possible observations across all phases and mean reliability across all phases for all participants was 86%. The researcher was the primary observer and a member of school staff involved in delivering the Social Story acted as the second assessor.

Observation data were graphed for visual analysis across baseline, intervention and follow-up phases. Visual analysis involved scrutiny of level, overlap, trend, length and stability, following Kratochwill et al.’s (2010) guidance on evaluating single-case research. Visual analysis methods are considered valid for determining intervention effects, particularly in real-world contexts (Smith, 2012).

In addition to visual analysis, Non-overlap of All Pairs (NAP; Parker & Vannest, 2009) and Tau-U (Parker, Vannest, Davis, & Sauber, 2011) were calculated to estimate intervention effects. NAP is a non-parametric method for determining overlap between each baseline data point and each intervention data point, where non-overlapping data indicates a performance difference between different phases of a study. Tau-U is a non-parametric effect size calculation for measuring data non-overlap for two phases and it also enables exploration of possible trend in baseline data (Rakap, 2015; Miller, Dufrene, Olmi, Tingstrom & Filce, 2015). Of the single-case effect size measures available, NAP and Tau-U are considered robust given their sensitivity, response to trend and statistical power (Parker, Vannest & Davis, 2011).

[Figure 1 near here]

*Generalisation and maintenance*

In order to gather generalisation data on the effect of a Social Story intervention, pre- and post-intervention each participant’s parent and teacher completed the relevant form of the Social Skills Improvement System (SSIS; Gresham & Elliott, 2008). This questionnaire explores a child’s behaviour in three areas: problem behaviours, social skills and academic competence. The academic competence scale was not included in the current study as it is only featured on the teacher form and was judged to be extraneous to the research question. Overall internal consistency is considered to be high, with median subscale reliabilities in the high .80s for the Teacher Form and mid .80s for the Parent Form (Gresham & Elliott, 2008). All alpha coefficients are equal to or exceed .70. In the US standardisation sample where 144 individuals were rated twice by the same teacher, test-retest reliability for the Teacher Form had a median adjusted coefficient of .81. For the Parent Form, 115 individuals were rated twice by a parent with a median subscale reliability coefficient of .80. The median adjusted reliability coefficient for interrater reliability on the Teacher Form was .58 and on the Parent Form was .59.

The Reliable Change Index (Jacobson & Truax, 1991) was used to analyse within-participant change in score on the SSIS, as this is considered a valid measure to explore change with a small sample size (Zahra & Hedge, 2010). Follow-up data were collected at four time points over a four week period following the end of the intervention phase in order to explore whether the effect of a Social Story intervention on a target behaviour was maintained. Maintenance of intervention effect was explored through analysing phase change (i.e. difference between baseline, intervention and follow-up phases) using NAP (Parker & Vannest, 2009) and Tau-U (Parker et al., 2011).

*Social validity*

Collecting data on social validity is considered an important element of the contribution SCD research can make. Information about social validity can be gained from those completing the intervention, the intervention agents. Feedback from intervention agents can include whether the intervention was acceptable, feasible and effective (Horner et al., 2005). This information was collected in the present study through the use of the Intervention Rating Profile–15 (IRP-15; Martens, Witt, Elliott, & Darveaux, 1985). The IRP-15 consists of 15 statements that address various aspects of intervention acceptability. Respondents are asked to indicate their level of agreement or disagreement with each item on a 6-point Likert-scale. IRP-15 scores range from 15-90 and higher scores are associated with acceptable interventions.

Given the emphasis on the effective involvement of children and young people in the SEND Code of Practice (2015) and in broader social research literature (Grover, 2004), the views of the four participants were also collected in a discussion with the researcher following the intervention phase. The Children’s Intervention Rating Profile (CIRP; Witt & Elliott, 1985) was incorporated into this discussion. The CIRP is a seven-item, one-factor scale that asks the child or young person to rate aspects of intervention procedures on a 6-point scale from *I agree* (1) to *I do not agree* (6).

###

### Participants

Participants in this study were drawn from two mainstream primary schools in a local authority in South-West London, England. The member of staff responsible for SEND co-ordination was asked to identify pupils in Key Stage 2 who were designated as having a special educational need, primarily for behaviour. The member of staff was also given a screening checklist to help them to identify children with communication difficulties who might benefit from the intervention. This screening checklist was developed by the researcher and the content related to the child’s communication skills was drawn from the Children’s Communication Checklist-2 (CCC-2; Bishop, 2003). The CCC-2 is a parent and/or teacher questionnaire which explores a child’s overall communication skills. Eight scales in the assessment give a General Communication Composite (GCC) score. The names and descriptions of the four scales from the CCC-2 related to pragmatic language specifically were drawn from the CCC-2 manual. Questions assessing the child’s suitability for a Social Story intervention were drawn from Gray’s guidance on Social Stories (2000; 2010). These included, for example, whether they had an interest in books or reading and whether it was possible to define a behaviour they found tricky in concrete, observable terms.

Key Stage 2 was identified as the target population due to its similarity to populations studied in previous research on communication and behaviour difficulties (for example, Lindsay et al., 2007; Mackie & Law, 2010). Children with a diagnosis of ASD or SLCN were excluded from the study, as well as those with a hearing impairment and speakers of English as an additional language. Participants were included if they scored more than one standard deviation (SD) below the population mean for one or more of the four scales that cover pragmatic aspects of communication (inappropriate initiation, stereotyped language, use of context and nonverbal communication) on the teacher-completed CCC-2 (Bishop, 2003). This cut-off was intended to identify children with elevated levels of pragmatic language difficulties relative to a normally distributed population. Please see Table 1 for participants’ CCC-2 scores.

[Table 1 near here]

Four participants were identified, three male and one female (Table 2). None of the participants were receiving a Social Story intervention or additional support for speech, language and communication needs at the time of the current study. Participants received a range of school-based interventions which continued alongside the Social Story intervention, including: mentoring, time out or with the SEND co-ordinator, LSA support, behaviour chart, restorative approach, social skills group, lunch play skills club and lunch buddy. The Social Story intervention was delivered in three cases by a female LSA, and for one participant by a female SEND teacher. Ferron and Jones (2006) recommend a minimum of four participants are included in multiple-baseline designs in order to demonstrate experimental effect equivalent to *p*<.05 and to ensure control over Type I error rates when conducting visual analysis of data.

#####

[Table 2 near here]

###

### Procedure

*Data collection*

***Target behaviour:*** Principles of functional behavioural assessment (FBA) were utilised to ensure the target behaviour and Social Story were aligned and meaningful for each child. Once a target behaviour was identified, a 15-minute observation of the child in class was undertaken using an ABC observation form to gather further information on the behaviour, as well as its antecedents and consequences (Bijou, Peterson & Ault, 1968).

The target behaviour for P1 was to reduce the amount of off-task behaviours he demonstrated in lessons. Examples of off-task behaviours included not putting his hand up before speaking, not facing the teacher and talking to peers where this was not directed as part of a task. Non-examples were looking in the direction of the teacher or the task and putting his hand up and waiting to be asked to speak. For P2, the target behaviour was to reduce the amount of off-task behaviours she demonstrated in lessons. Examples included putting her head on the table, fiddling with objects not related to the task and not waiting to be asked before speaking. Non-examples were engaging with the task as directed and not calling out to answer teacher questions. The target behaviour for P3 was to reduce the proportion of time he was off-task during maths lessons. Examples of the target behaviour included talking off-topics, clapping and saying something unrelated to the task. Non-examples were responding to a teacher question or instruction and engaging with a task. For P4, the target behaviour was to reduce the amount of physical interaction he demonstrated with other children. Examples of physical interaction included grabbing, touching or pushing another child while non-examples were not touching others and interacting in a non-physical way.

***Establishing the baseline:*** Table 3 outlines the study design employed in the current research. A nonconcurrent multiple-baseline design was employed and therefore pre-determined baseline lengths were established as recommended by Watson and Workman (1981). Participants were randomly allocated to a baseline phase with a minimum of five data points (Horner et al., 2005). Baseline data were collected across participants in the form of 15-minute observations employing a 10-second partial interval recording strategy. This means that the 15-minute observation period was divided into 10 second blocks, with half the time devoted to observing and half to recording. If the participant demonstrated a target behaviour in the 10-second observing blocks then this was noted. A proportion of time the target behaviour was displayed for could then be calculated. Observations were conducted three times a week by the researcher and the LSA or teacher. Once the intervention was introduced for each participant, observations continued in the same manner throughout the entire intervention phase.

[Table 3 near here]

*Social Story intervention*

***INSET training:*** The researcher designed and delivered an INSET session on Social Stories for the four members of school staff involved in delivering the Social Story intervention, as well as the SEND co-ordinator of each primary school. The content for the training was drawn from resources made available to Social Story practitioners, in particular *The New Social Story Book* (Gray, 2010) and *Writing Social Stories* (Gray, 2000). The INSET was designed according to Gray’s ten criteria for writing Social Stories, the 10.1 Tutorials (Gray, 2010), as outlined in Table 4. Following the training, school staff were provided with a manualised copy of materials so that they could refer to these throughout the duration of the study.

#####

##### [Table 4 near here]

***Social Story design:*** Research into the moderator variables associated with effective Social Story interventions was drawn on when designing the intervention. A meta-analysis of the role of a range of moderator variables found that Social Stories were more effective when they: focused on reducing inappropriate behaviours; contained eleven or more sentences; incorporated visuals as well as text; included comprehension checks; and used functional assessment when designing the intervention (Kokina & Kern, 2010). These features were therefore incorporated into the Social Stories that were produced for the current study.

The Social Stories were written collaboratively by the researcher and the LSA or teacher in a Social Story writing workshop. The Social Story Checklist (Gray, 2000) was used to ensure that the Social Stories adhered to Gray’s guidance, in particular with regard to a positive tone and the inclusion of a range of sentence types (for example, descriptive, perspective or affirmative). The finalised Social Stories were printed on A4 paper to fit A5 size presentation folders.

*Intervention implementation*

The Social Story intervention was delivered by two members of staff in each primary school. The Social Stories for P1, P2 and P3 were delivered by LSAs and the Social Story for P4 was delivered by a teacher in charge of SEN. Following guidance by Kokina and Kern (2010), the duration of the intervention was kept brief and therefore nine intervention sessions were planned. The intervention was delivered three times per week for three weeks, in order to align with the rate of observations carried out in the baseline phase. Kokina and Kern (2010) recommend the intervention should be delivered immediately before the target situation, which was adhered to where possible, along with Gray’s (2010) advice to read the Social Story in a quiet, calm space. For example, the Social Story for P4 was read just before lunchtime so that he received a reminder of behavioural expectations for playtime. Social Stories were found to be more effective when read by the target student (Kokina & Kern, 2010) and therefore school staff were encouraged to allow the child to do this if they wished.

Adhering to Kratochwill’s (2003) guidance, intervention fidelity was planned for in a number of ways in order to ensure acceptable treatment adherence was achieved, including: provision of ongoing support to school staff during the intervention phase, provision of an intervention manual in the form of the INSET training materials and compilation of a checklist of steps to cover during Social Story delivery.

## Results

### Visual analysis

Figure 2 includes direct observation data for participants’ target behaviour, while Table 5 displays mean proportion of target behaviour for each participant by phase (baseline, intervention and follow-up) as a percentage of all possible intervals (maximum of 45). For each phase, more than three data points were recorded for all participants, which enables analysis of experimental effect to be undertaken with more confidence (Horner et al., 2005). Across participants, mean Social Story intervention phase data indicated a reduction in problematic behaviour. Mean follow-up phase target behaviour continued to be lower than at baseline, although sometimes indicated a slight increase compared to intervention phase data. These results suggest an ongoing effect of the Social Story intervention.

[Figure 2 near here]

[Table 5 near here]

###

### Effect size calculations

Table 6 includes NAP (Parker & Vannest, 2009) scores for each participant’s target behaviour. Parker and Vannest (2009) offer an interpretation of the strength of intervention effect indicated by NAP scores, where 0-.65 indicate weak effects; .66-.92 medium effects; and .93-1.0 large or strong effects. The effect of the Social Story intervention was medium for P1 and P3 and weak for P2 and P4, although for P4 it was approaching a medium size effect. When considering maintenance of intervention effect, there was a weak effect for P1, P2 and P3, and a strong effect for P4.

[Table 6 near here]

Table 7 displays Tau-U (Parker, Vannest, Davis, & Sauber, 2011) scores which represent an aggregated effect size across participants for each phase. The magnitude of the Tau-U score can be evaluated using the same weightings employed for NAP (Miller et al., 2015; Rakap, 2015). There was an overall significant effect of the Social Story intervention (*p*=.02), though this effect was weak (Tau-U=-.35). There was a non-significant change from intervention to follow-up phase, indicating that the effect of the Social Story intervention maintained beyond the period of active delivery. However, the non-significant change from baseline to follow-up suggests some return of levels of target behaviour to those seen prior to intervention. When baseline data were analysed for trend, P3’s baseline was found to demonstrate significant trend in the direction of intervention and therefore corrected Tau-U scores, which are intended to correct for baseline trend, are also reported in Table 7. The corrected score for the effect of the intervention phase indicates a slightly reduced effect size (Tau-U=-.28) compared to the uncorrected score and a *p*-value approaching significance (*p*=.06).

[Table 7 near here]

### Generalisation of intervention effect

Table 8 shows pre- and post-test results on the SSIS for both the parent and teacher forms and Table 9 displays Reliable Change Index (RCI; Jacobson & Truax, 1991) scores for each participant, which were calculated using Zahra’s (2010) calculator. According to Jacobson and Truax (1991), an RCI with a magnitude of 1.96 or greater in either direction is statistically reliable at the *p*<.05 level. There were some post-intervention improvements in social skills and problem behaviours across participants, including statistically reliable change for P4 in terms of parent-reported social skills (RCI=2.06) and teacher-reported problem behaviours (RCI=-4.83), as well as P1 in terms of parent-reported improvements in social skills (RCI=2.95).

[Table 8 near here]

[Table 9 near here]

***Intervention acceptability***

IRP-15 responses from the four members of school staff who delivered the Social Story intervention were analysed to assess intervention acceptability. Von Brock and Elliott (1987) suggest that scores above 52.5 indicate adequate acceptability for an intervention. The LSA for P1 rated the intervention 77 out of a possible maximum score of 90, the LSA for P2 rated the Social Story 71, the LSA rated it 78 and the teacher for P4 rated it 61. Therefore, all respondents rated the Social Story highly in terms of intervention acceptability. The mean score on the IRP-15 across all members of school staff was 71.75, indicating high acceptability.

Participant responses to the CIRP were also analysed to assess the child’s perspective of the intervention’s acceptability. On a rating scale from 1-6, where 1 indicates a low score and 6 indicates a high score, the mean rating on the CIRP across all four participants was 4.82. P1 and P3’s mean rating for the Social Story was 5, P2 rated it 4.86 and P4 rated the intervention 4.43. On the whole, then, the children viewed the Social Story intervention positively.

## Discussion

### Impact of a Social Story intervention

The present study extends current knowledge of the usefulness of Social Stories and contributes to research exploring potential interventions for children with behaviour and pragmatic language difficulties. The introduction of a Social Story in the intervention phase led to a reduction in the target problematic behaviour across all four participants, as demonstrated by a decrease in mean proportion of intervals in which the target behaviour was present. The strength of the intervention effect was more variable in that a medium effect size was observed for two participants and a weak effect for two participants. The results are consistent with previous research indicating that Social Stories are effective in changing target behaviour in groups of children other than those with ASD (Toplis & Hadwin, 2006; Schneider & Goldstein, 2009; Benish & Bramlett, 2011). The finding of weak or medium effects of intervention is reflected in the literature on Social Stories, in that previous studies have reported variable effects (Toplis & Hadwin, 2006; Schneider & Goldstein, 2009).

Worthy of consideration are potential factors responsible for the relatively larger impact of intervention for P1 and P3. Considering the participants’ profiles, it would appear that academic level and extent of pragmatic language difficulties did not play a role. However, both participants demonstrated comparatively greater proportions of the target behaviour during the baseline phase (53.33% P1, 40.25% P3) compared to P2 and P4. It may be that Social Stories are more effective for children who demonstrate greater severity of problematic behaviour. The question of whether Social Stories are more appropriate for high levels of challenging behaviour has been given limited focus in the literature, though Kokina and Kern (2010) suggest, conversely, that greater intervention effects are found for participants with low levels of challenging behaviour. However, most of the studies included in their review were conducted in special education settings, which may reflect differences in the kinds of behaviour classified as low or high severity.

Findings related to the generalisation of Social Story effects were inconclusive in that, for each participant, there were some reported improvements in either social skills or problem behaviours. However, considering the data from this small-scale study, it may be that the impact of Social Stories generalises more successfully to reducing other problem behaviours rather than improving general social skills. There are several possible explanations for the limited degree of generalisation effects found, including the nature of Social Stories as a targeted intervention or, as Toplis and Hadwin (2006) point out, the fact that the time frame used in the current study may have been too short to allow any broad changes to develop.

Visual analysis indicated that there was some maintenance of intervention effect for all four participants and levels of target behaviour appeared to remain consistent with those observed during the intervention phase. This is important given both the ethical and cost considerations that should lead decision-makers to select interventions that have a lasting impact (Tolan, 2014; Higgins et al., 2013). The exploration of maintenance of intervention effects also addresses a limitation consistently identified in Social Story research that follow-up data is only collected in a minority of studies (McGill et al., 2015).

Both school staff who delivered the intervention and the children who participated rated the Social Story positively. IRP-15 and CIRP responses indicated high intervention acceptability, which is viewed as an indicator of social validity (Horner et al., 2005). Such a finding provides further evidence for the practicality of Social Stories as a school-based intervention. The finding that children also viewed the intervention positively is particularly valuable given the current emphasis in legislation and research on establishing the views of children and young people (Harding & Atkinson, 2009; SEND CoP, 2015).

### Limitations

There are a number of limitations to the design and methodology employed in the present study. There were some weaknesses in the quality of participants’ baseline and intervention phase data, such as instability in baseline phase data, which affected the extent to which the Social Story could be considered effective. One option available to address these problems in single-case research is to extend the baseline period until data have reached a point of stability (Kazdin, 1978). In the present study, this was not an option due to availability of staff delivering the intervention and timetabling demands of the school academic year.

The design of the study involved a focus on individualised target behaviours, meaning that not all the problem behaviours were the same and therefore the intervention was not focused on the same thing in each case. In addition, it could be argued that the level of P2’s problem behaviour, in particular, was not high enough to warrant intervention. However, the purpose of the present study was to explore the effect of Social Stories in a mainstream school environment and the clinical significance of behaviour change following a Social Story intervention is something that has been identified by previous researchers as a valuable factor to take into account (Ali & Frederickson, 2006). Given that the majority of target behaviours were related to off-task instances, it would have been useful to explore Social Story effectiveness for a wider range of externalising behaviours to identify whether there were particular kinds of behaviour for which they are more effective.

The study’s single-case design also limits the extent to which generalised conclusions can be drawn given the small sample size. The structure of the single-case design into baseline and intervention phases was intended to provide a form of within-participant control. However, there was no inclusion of a control group and this also limits the extent to which conclusions can be drawn and generalised from findings. Finally, the fact that the researcher was also the primary observer and the school LSA was the secondary observer may have presented a threat in terms of bias. Attempts were made to control for this through use of standard forms and providing training to the LSA. The observation sessions could have been filmed and coded for occurrence of target behaviour by an external observer, which would have enabled more extensive verification of data. Due to resource constraints, it was not possible to establish an additional observer for the present study.

###

### Implications of the present study

#### Contributions to the evidence base

The current research contributes to an evidence base for interventions to support children with pragmatic language difficulties which is in its infancy but growing (Law et al., 2012; Bishop et al., 2017; Ketelaars & Embrechts, 2017). Interventions delivered in school settings have thus far focused on clinical levels of need and required considerable specialist input in terms of training and delivery (Adams et al., 2012a; Adams et al., 2012b). The present study offers evidence of a potential avenue for targeted intervention for children with an elevated level of language difficulties. This fits with the recommendations from the Better Communication Research Programme (Lindsay, Dockrell, Law & Roulstone, 2012) for a level of targeted provision for children requiring additional support within mainstream settings.

While the magnitude of behaviour change following a Social Story intervention may be relatively small statistically, their simplicity and low resource implications mean that they continue to be a useful intervention for schools to consider. Linked to this, the current research also provides evidence in support of the efficacy of school-delivered interventions and is an example of the effective deployment of classroom assistants (Sharples, Webster & Blatchford, 2015).

#### Considerations for future research

Typologies of evidence such as that designed by Gray (1996) indicate possible next steps in exploring the effectiveness of Social Stories for children with pragmatic language and behaviour difficulties. A randomised controlled trial of Social Story implementation would allow for exploration of the intervention with a larger sample size and enable comparison with an alternative treatment control group. Future research could also explore the specific components of the intervention which contribute to its effectiveness. Drawing on the ideas of McGill et al. (2015), more research is needed to examine the efficacy of Social Stories as part of a comprehensive treatment package for communication difficulties, working alongside other language interventions.

## References

Adams, C., and D. V. Bishop. 1989. “Conversational Characteristics of Children with Semantic-Pragmatic Disorder. I: Exchange Structure, Turntaking, Repairs and Cohesion.” *British Journal of Disorders of Communication* 24(3): 211-239.

Adams, C., E. Lockton, J. Freed, J. Gaile, G. Earl, K. McBean, M. Nash, J. Green, A. Vail,

and J. Law. 2012a. “The Social Communication Intervention Project: A Randomized Controlled Trial of the Effectiveness of Speech and Language Therapy for School‐Age Children who have Pragmatic and Social Communication Problems with or without Autism Spectrum Disorder.” *International Journal of Language & Communication Disorders* 47(3): 233-244.

Adams, C., E. Lockton, J. Gaile, G. Earl, and J. Freed. 2012b. “Implementation of a Manualized Communication Intervention for School‐Aged Children with Pragmatic and Social Communication Needs in a Randomized Controlled Trial: The Social Communication Intervention Project.” *International Journal of Language & Communication Disorders* 47(3): 245-256.

Ali, S., and N. Frederickson. 2006. “Investigating the Evidence Base of Social Stories.” *Educational Psychology in Practice* 22(4): 355-377.

American Psychiatric Association. 2013. *Diagnostic and Statistical Manual of Mental Disorders: DSM-5.* Washington, D.C: American Psychiatric Association.

Baker, S. 2013. “Effects of Social Stories on Non-Compliant Behaviour in Preschool General Education Setting.” Unpublished Masters dissertation, State University of New York, New York.

Barlow, D. H., M. Nock, and M. Hersen. 2009. *Single Case Experimental Designs:*

*Strategies for Studying Behaviour Change.* Boston: Pearson.

Baron-Cohen, S., and M. K. Belmonte. 2005. “Autism: A Window onto the Development of the Social and the Analytic Brain.” *Annual Review of Neuroscience* 28: 109-126.

Benish, T. M., and R. K. Bramlett. 2011. “Using Social Stories to Decrease Aggression and Increase Positive Peer Interactions in Normally Developing Pre‐School Children.” *Educational Psychology in Practice*: 27(1): 1-17.

Bijou, S. W., R. F. Peterson, and M. H. Ault. 1968. “A Method to Integrate Descriptive and Experimental Field Studies at the Level of Data and Empirical Concepts.” *Journal of Applied Behaviour Analysis* 1(2): 175-191.

Bishop, D. V. 1998. “Development of the Children's Communication Checklist (CCC): A Method for Assessing Qualitative Aspects of Communicative Impairment in Children.” *Journal of Child Psychology and Psychiatry* 39(06): 879-891.

Bishop, D. V. M. 2003. *The Children’s Communication Checklist—2.* London:

Psychological Corporation.

Bishop, D. V., M. J. Snowling, P. A. Thompson, and T. Greenhalgh. 2017. “Phase 2

of CATALISE: A Multinational and Multidisciplinary Delphi Consensus Study of Problems with Language Development: Terminology.” *Journal of Child Psychology and Psychiatry*.

British Psychological Society. 2009. *Code of Ethics and Conduct*. Leicester: BPS.

Bryan, K., J. Freer, and C. Furlong. 2007. “Language and Communication Difficulties

in Juvenile Offenders.” *International Journal of Language & Communication Disorders* 42(5): 505-520.

Christ, T. J. 2007. “Experimental Control and Threats to Internal Validity of Concurrent and Nonconcurrent Multiple Baseline Designs.” *Psychology in the Schools* 44(5): 451-459.

Clegg, J., J. Stackhouse, K. Finch, C. Murphy, and S. Nicholls. 2009. “Language

Abilities of Secondary Age Pupils at Risk of School Exclusion: A Preliminary Report.” *Child Language Teaching and Therapy* 25(1): 123-139.

Department for Education (DfE). 2015. *Special Educational Needs and Disability (SEND) Code of Practice: for 0 to 25 years*. London: DfE.

Department for Education (DfE). 2017. “SFR 37/2017 – Special Educational Needs in England: January 2017.” Accessed September 2017. <https://www.gov.uk/government/statistics/special-educational-needs-in-england-january-2017>

Department for Education and Skills (DfES). 2001. “Skills for Life – the National Strategy for Improving Adult Literacy and Numeracy Skills.” London: DfES.

Dockrell, J. E., and G. Lindsay. 2001. “Children with Specific Speech and Language

Difficulties - The Teachers' Perspective.” *Oxford Review of Education* 27(3): 369-394.

Dunn, L. M., L. M. Dunn, C. Whetton, and J. Burley. 1997. *The British Picture Vocabulary Scale.* 2nd ed. Windsor: NFER-Nelson.

Ferron, J., and P. K. Jones. 2006. “Tests for the Visual Analysis of Response-Guided

Multiple-Baseline Data.” *The Journal of Experimental Education* 75(1): 66-81.

Frederickson, N., and T. Cline. 2009. *Special Educational Needs, Inclusion and Diversity*. Berkshire: Open University Press.

Gibson, J., C. Adams, E. Lockton, and J. Green. 2013. “Social Communication Disorder Outside Autism? A Diagnostic Classification Approach to Delineating Pragmatic Language Impairment, High Functioning Autism and Specific Language Impairment.” *Journal of Child Psychology and Psychiatry* 54(11): 1186-1197.

Goodman, R. 1997. “The Strengths and Difficulties Questionnaire: A Research Note.”

*Journal of Child Psychology and Psychiatry* 38(5): 581-586.

Gray, C. A., and J. D. Garand. 1993. “Social Stories: Improving Responses of Students with Autism with Accurate Social Information.” *Focus on Autistic Behaviour* 8(1): 1-10.

Gray, C. 2000*. Writing Social Stories with Carol Gray*. Arlington, TX: Future Horizons.

Gray, C. 2010. *The New Social Story Book*. Arlington, TX: Future Horizons.

Gray, J. A. M. 1996. *Evidence-Based Healthcare*. London: Churchill Livingstone, 1996.

Gregory, J., and K. Bryan. 2011. “Speech and Language Therapy Intervention with a

Group of Persistent and Prolific Young Offenders in a Non‐Custodial Setting with Previously Undiagnosed Speech, Language and Communication Difficulties.” *International Journal of Language & Communication Disorders* 46(2): 202-215.

Gresham, F., and S. N. Elliott. 2008. *Social Skills Improvement System (SSIS) Rating Scales*. Bloomington, MN: Pearson Assessments.

Grover, S. 2004. “Why won’t they listen to us? On giving power and voice to children participating in social research.” *Childhood* 11(1): 81-93.

Harding, E., & Atkinson, C. 2009. “How EPs record the voice of the child.” *Educational Psychology in Practice* 25(2): 125-137.

Higgins, S., M. Katsipataki, D. Kokotsaki, R. Coleman, L. E. Major, and R. Coe. 2013. *The Sutton Trust-Education Endowment Foundation Teaching and Learning Toolkit*. London: Education Endowment Foundation.

Horner, R. H., E. G. Carr, J. Halle, G. McGee, S. Odom, and M. Wolery. 2005. “The Use of Single Subject Research to Identify Evidence-Based Practice in Special Education.” *Exceptional Children*, 71: 165-179.

Hyter, Y. D. 2017. “Pragmatic Assessment and Intervention in Children.” In *Research in Clinical Pragmatics*, edited by L. Cummings, 493-526. London: Springer International Publishing.

Jacobson, N. S., and P. Truax. 1991. “Clinical Significance: A Statistical Approach to Defining Meaningful Change in Psychotherapy Research.” *Journal of Consulting and Clinical Psychology* 59(1): 12-19.

Kazdin, A. E. 1978. “Methodological and Interpretive Problems of Single-Case Experimental Designs.” *Journal of Consulting and Clinical Psychology* 46(4): 629-642.

Ketelaars, M. P., and M. T. Embrechts. 2017. “Pragmatic language impairment.” In *Research in Clinical Pragmatics*, edited by L. Cummings, 29-57. London: Springer International Publishing.

Kokina, A., and L. Kern. 2010. “Social Story Interventions for Students with Autism Spectrum Disorders: A Meta-Analysis.” *Journal of Autism and Developmental Disorders* 40(7): 812-826.

Kratochwill, T. R. 2003. “Task Force on Evidence-Based Interventions in School Psychology.” Accessed February 2015. [www.indiana.edu/~ebi/EBI-Manual.pdf](http://www.indiana.edu/~ebi/EBI-Manual.pdf)

Kratochwill, T. R., J. Hitchcock, R. H. Horner, J. R. Levin, S. L. Odom, and D. M.

Rindskopf, et al. 2010. “Single-Case Designs Technical Documentation.” What Works Clearinghouse. Accessed February 2015. <http://ies.ed.gov/ncee/wwc/pdf/wwc_scd.pdf>

Law, J., W. Lee, S. Roulstone, Y. Wren, B. Zeng, and G. Lindsay. 2012. *'What*

*Works': Interventions for Children and Young People with Speech, Language and Communication Needs.* London: DfE.

Law, J., R. Rush, and K. McBean. 2014. “The Relative Roles Played by Structural and

Pragmatic Language Skills in Relation to Behaviour in a Population of Primary School Children from Socially Disadvantaged Backgrounds.” *Emotional and Behavioural Difficulties* 19(1): 28-40.

Lindsay, G., J. E. Dockrell, and S. Strand. 2007. “Longitudinal Patterns of Behaviour

Problems in Children with Specific Speech and Language Difficulties: Child and Contextual Factors.” *British Journal of Educational Psychology* 77(4): 811-828.

Lindsay, G., J. Dockrell, J. Law, and S. Roulstone. 2012. *The Better Communication Research Programme: Improving Provision for Children and Young People with Speech, Language and Communication Needs.* London: DfE.

Mackie, L., and J. Law. 2010. “Pragmatic Language and the Child with

Emotional/Behavioural Difficulties (EBD): A Pilot Study Exploring the Interaction Between Behaviour and Communication Disability.” *International Journal of Language & Communication Disorders* 45(4): 397-410.

Mackie, L., and J. Law. 2014. “The Functional Communication Skills of Boys with

Externalising Behaviour with and without Co-Occurring Language Difficulties.”

*Emotional and Behavioural Difficulties* 19(1): 89-105.

Martens, B. K., J. C. Witt, S. N. Elliott, and D. X. Darveaux. 1985. “Teacher

Judgments Concerning the Acceptability of School-Based Interventions.” *Professional Psychology: Research and Practice* 16(2): 191-198.

McGill, R. J., D. Baker, and R. T. Busse. 2015. “Social Story Interventions for Decreasing Challenging Behaviours: A Single-Case Meta-Analysis 1995–2012.” *Educational Psychology in Practice* 31(1): 21-42.

Miller, L. M., B. A. Dufrene, D. J. Olmi, D. Tingstrom, and H. Filce. 2015. “Self-Monitoring as a Viable Fading Option in Check-In/Check-Out.” *Journal of School Psychology* 53(2): 121-135.

Parker, R. I., and K. Vannest. 2009. “An Improved Effect Size for Single-Case Research: Nonoverlap of All Pairs.” *Behaviour Therapy* 40(4): 357-367.

Parker, R. I., K. J. Vannest, and J. L. Davis. 2011. “Effect Size in Single-Case Research: A Review of Nine Nonoverlap Techniques*.” Behaviour Modification* 35(4): 303-322.

Parker, R. I., K. J. Vannest, J. L. Davis, and S. B. Sauber. 2011. “Combining Nonoverlap and Trend for Single-Case Research: Tau-U.” *Behaviour Therapy* 42(2): 284-299.

Rakap, S. 2015. “Effect Sizes as Result Interpretation Aids in Single‐Subject Experimental Research: Description and Application of Four Nonoverlap Methods.” *British Journal of Special Education* 42(1): 11-33.

Reynhout, G., and M. Carter. 2006. “Social Stories for Children with Disabilities.” *Journal of Autism and Developmental Disorders* 36(4): 445-469.

Sansosti, F. J., K. A. Powell-Smith, and D. Kincaid. 2004. “A Research Synthesis of Social Story Interventions for Children with Autism Spectrum Disorders.” *Focus on Autism and Other Developmental Disabilities* 19(4): 194-204.

Schneider, N., and H. Goldstein. 2009. “Social Stories Improve the On-Task Behaviour of Children with Language Impairment.” *Journal of Early Intervention* 31(3): 250-264.

Sharples, J., R. Webster, and P. Blatchford. 2015. *Making Best Use of Teaching Assistants*. London: Education Endowment Foundation.

Smith, J. D. 2012. “Single-Case Experimental Designs: A Systematic Review of Published Research and Current Standards.” *Psychological Methods* 17(4): 510-550.

Test, D. W., S. Richter, V. Knight, and F. Spooner. 2011. “A Comprehensive Review and Meta-Analysis of the Social Stories Literature.” *Focus on Autism and Other Developmental Disabilities* 26(1): 49-62.

Tolan, P. H. 2014. “More than Afterthoughts and Details: Maintenance and Booster Effects as Critical Elements of Intervention Research.” *Journal of Abnormal Child Psychology* 42(3): 399-402.

Toplis, R., and J. A. Hadwin. 2006. “Using Social Stories to Change Problematic Lunchtime Behaviour in School.” *Educational Psychology in Practice* 22(1): 53-67.

Von Brock, M. B., & Elliott, S. N. 1987. “Influence of treatment effectiveness information on the acceptability of classroom interventions.” *Journal of School Psychology* 25(2): 131-144.

Watson, P. J., and E. A. Workman. 1981. “The Non-Concurrent Multiple Baseline

Across-Individuals Design: An Extension of the Traditional Multiple Baseline Design.” *Journal of Behaviour Therapy and Experimental Psychiatry* 12(3): 257-259.

Whitehead, J. O. 2007. “Telling it Like it is: Developing Social Stories for Children in Mainstream Primary Schools.” *Pastoral Care in Education* 25(4): 35-41.

Witt, J. C., and S. N. Elliott. 1985. “Acceptability of Classroom Intervention Strategies.” In *Advances in School Psychology*, edited by T. R. Kratochwill, Vol. 4, 251–288. Mahwah, NJ: Lawrence Erlbaum.

Zahra, D. 2010. “Reliable Change Index Calculator.” Daniel Zahra: Emotion-Reasoning Research. Accessed February 2015. <http://daniel-zahra.webs.com/publications.htm>

Zahra, D., and C. Hedge. 2010. “The Reliable Change Index: Why Isn't it More Popular in Academic Psychology?” *PsyPAG Quarterly* 76: 14-19.