

# **The effectiveness of social stories on verbal initiation and social communication for children with Autism Spectrum Disorder**

**Allwright, S.**

This evidence-based review has been prepared by masters-entry students as part of Occupational Therapy Field Practice 4 at the University of South Australia. Due to limitations of assignment requirements, reviews are limited in terms of number of evidence sources. Conclusions and implications for clinical practice reported are provisional based on the evidence identified in this review and should be contextualized to local practice, clinical expertise and patient values. For further information on the review process please contact

[Kobie.Boshoff@unisa.edu.au](mailto:Kobie.Boshoff@unisa.edu.au)

## **Abstract**

**Background:** A fundamental characteristic of children with Autism Spectrum Disorder (ASD) is difficulties with social interactions including social communication skills and verbal initiations (Sansosti & Powell-Smith, 2008, & Brock & Arciuli, 2014). Due to the impact this will likely have on a number of occupations for children it is important that therapists can correctly identify intervention strategies which will be most beneficial to improve social engagement for children with ASD. **Review question:** This systematic review aims to identify the effectiveness of social stories on verbal initiation and social communication for children with ASD. **Method:** Three health focused databases, Emcare, Embase and Scopus, were deemed most appropriate and searched for relevant articles. Three research articles were identified as appropriate for this clinical question through the use of Covidence screening and an inclusion and exclusion criteria. All articles were critically appraised using the McMaster Critical Appraisal tool. **Results:** Due to the variances in outcome measures the synthesis of results had to be completed based on overall trends of data. All studies found an overall increase in the targeted behaviours of social communication and verbal initiation, but two studies (Sansosti & Powell, 2008, & Thiemann & Goldstein, 2001) found a more prominent increase. The final study (Hanley-Hochdorfer, et al, 2010) still identified moderate positive improvements in scores but the changes were only minor in comparison. **Conclusion:** Overall, social stories are a relatively harm-free therapeutic intervention which may provide promising results in increasing social communication and verbal initiation skills in children with ASD, however due to limitations of the studies the results must be taken with caution and more research is required to promote confidence and accuracy in the intervention.

## Background

Occupational Therapists working in paediatric settings often work with children with diagnosed Autism Spectrum Disorder (ASD) (Grandisson, et al, 2020). A fundamental characteristic of children with ASD is difficulties with social interactions including social communication skills and verbal initiations (Sansosti & Powell-Smith, 2008, & Brock & Arciuli, 2014). This can impact upon a number of occupations for children, including education, social engagements, and play, therefore it is important that therapists can identify intervention strategies which may be most beneficial to improve on this skill and help them to engage more readily in their occupations (Hanley-Hochdorfer, et al, 2010). Social stories can be defined as ‘individualised short stories written from a child’s perspective that explain challenging social situations through visual supports and text’ (Gray, 1998 & Sansosti & Powell-Smith, 2008).

Social stories are commonly used in Occupational Therapy and are frequently used with children with ASD to work on a variety of targeted behaviours. There has been a substantial amount research conducted on the impact of social stories on social engagement and other areas of occupations but to date there are no systematic reviews highlighting the impact of social stories on social communication and verbal initiation. This systematic review aims to identify the effectiveness of social stories on verbal initiation and social communication for children with ASD (PICO in Table 1).

**Table 1: PICO**

Population	Children (0-18y.o.) with Autism Spectrum Disorder
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Intervention	Social Stories
Comparison	No comparison
Outcome	Verbal initiation as part of social communication

## Method

Three health focused databases, Emcare, Embase and Scopus, were search and deemed most appropriate to locate relevant studies to answer the clinical question. To locate relevant studies the following search terms were used with truncation: (Child\* or adolescen\*) AND (Autism or ASD or Asperger's) AND (Social communicat\* or language) AND Social Stor\* (example search in Appendix A). A list of inclusion and exclusion criteria was also created to ensure only most relevant research was identified (Table 2).

**Table 2: Inclusion and Exclusion criteria**

Inclusion	Exclusion
Autism Spectrum Disorder (ASD) or Asperger's	Children without a diagnosis of ASD or Asperger's
Children or adolescence	Adults
Social Story interventions	Other social skill interventions

Social communication or verbal communication/initiation	Social skills without a focus on communication and inclusion of verbal initiation
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### *Results of search*

Three research articles were identified as appropriate for the review through the use of Covidence screening. All databases were searched and data were imported to Covidence, there were initially 253 studies for screening, 27 duplicates were identified and removed. The 226 remaining studies were screened and then assessed for eligibility using the inclusion and exclusion criteria (PRISMA diagram - Appendix B). From here three full text articles were identified as meeting all elements of the inclusion criteria and were appropriate for inclusion (Table 3). The three studies were the highest evidence available for the research topic but overall were still quite low quality regarding the hierarchy of evidence. The three studies were all case studies with pre- and post-test outcomes, which is a level 4 study on the NHMRC evidence hierarchy (Coleman, et al, 2008).

**Table 3: Selected studies**

<b>Author's and Date of article publication</b>	<b>Article Title</b>
Hanley-Hochdorfer, Bray, Kehle & Elinoff, 2010	Social Stories to increase verbal initiation in children with Autism and Asperger's disorder

Sansosti & Powell-Smith, 2008	Using computer-presented social stories and video models to increase the social communication skills of children with high-functioning Autism Spectrum Disorder
Thiemann & Goldstein, 2001	Social stories, written text cues, and video feedback: Effects on social communication of children with Autism

The McMaster critical review tool for quantitative studies was used to assess the methodological quality. This tool was chosen as it is easily accessible and commonly used for its relation to Occupational Therapy practice and it was appropriate for the research articles. This review tool assists reader to critically analyse the studies in regards to their purpose, background literature, design, sample, outcomes, intervention, results and conclusions.

## **Results of data**

Initially the results for all three identified studies were analysed independently (Table 4) and then all results were synthesised together to provide an overarching view of the research findings. Two studies had similar outcome measures, frequency ratings of target behaviours, whilst one study used percentage of targeted behaviours during a given interval. Due to the variances in outcome measures the synthesis of results had to be completed based on overall trends of data rather than specific data score comparison. All studies found overall increases in the targeted behaviour of social communication and verbal initiation but two studies (Sansosti & Powell, 2008, & Thiemann & Goldstein, 2001) found a more prominent increase, highlighted by the improvements in individual scores and overall study conclusions. The final study (Hanley-Hochdorfer, et al, 2010) still identified moderate positive improvements in scores but the changes were only minor in comparison and the conclusion

highlights this by stating the research provided limited support. Individual numerical results for all participants in each study can be found below in Table 3. Unfortunately, none of the studies provided statistical significance for any of their data so this factor remains unknown.

**Table 4: Description and Results from all three independent studies**

<b>Article title and research design</b>	<b>Study objective</b>	<b>Participants</b>	<b>Intervention procedure</b>	<b>Outcome Measure</b>	<b>Results and findings</b>
‘Social stories, written text cues, and video feedback: Effects on social communication of children with Autism’ (Thiemann & Goldstein, 2001)  Multiple baseline design across participants  OR	“To investigate the effects of written text and pictorial cuing with supplemental video feedback on social communication of 5 students with Autism and social deficits”	5 male children with social impairments (ASD) and 10 of their peers without disabilities.  Focus children age range - 6yrs  6months- 12 years  2 months  For inclusion:	Participants attended two 30-minute treatment sessions per week  Session break down:  10 minutes: Social story read to participants by trained reader  10 minutes: participants engaged in themed social play  10 minutes: self-evaluation using video	Behaviour frequency counting during for target behaviors during observation during (during 10 minute social interaction period)  Target behaviors:  Securing attention  Initiating comments  Initiating requests  Contingent responses	Overall Increases were found in number of targeted social communication skills for all participants  Participant 1:  Pre: 2.3-Post:3  P2:  2.2-4.2  P3:  1.9-3.5  P4:



‘Before-after trial in same subject’ case study		Impaired social communication, emerging or acquired word- identification skills, functional verbal communication			1.4-2.7  P5: 2.1-4/1
‘Using computer- presented social stories and video models to increase the social communication skills of children with high- functioning Autism	“To investigate the effects of computer presented social stories and video models on the social	3 male children with ‘high- functioning autism/ Asperger’s syndrome’  Age range – 6 year 6 month – 10	Computer-presented social stories and video models were implemented  Each participant received their own personalized social story aimed to address an identified behaviour  Each participant watched	The effect of each video- modelled social story was assessed by measuring the percentage of intervals of social communication during observation periods (15-20 minutes twice/week during recess)	Overall increases were identified in percentage of intervals of target behaviours, but reinforcements were needed in two cases  P1: 2.75%-30% (51.75% with prompts given)  P2:

<p>Spectrum Disorder’</p> <p>(Sansosti &amp; Powell-Smith, 2008)</p> <p>Multiple baseline design across participants</p> <p>OR</p> <p>‘Before-after trial in same subject’ case study</p>	<p>communication skills of 3 children with high-functioning Autism”</p>	<p>year 6 month</p> <p>Inclusion criteria:</p> <p>Current diagnosis of ASD/ Asperger’s;</p> <p>current levels of cognitive function – below average- above average;</p> <p>Ability to communicate functionally;</p> <p>Included in general education</p>	<p>their digital social story once per day, five days per week, immediately before recess</p>	<p>Target behaviors:</p> <p>Initiating communication/</p> <p>Joining in</p> <p>Maintain conversation</p>	<p>4.85%-21% (83.17% with prompts given)</p> <p>P3:</p> <p>7.18%-55.56% (no prompts given)</p>
<p>‘Social Stories to increase verbal</p>	<p>“To investigate the</p>	<p>4 children (1 with ASD and 3 with</p>	<p>Participants were separately read a personalized social</p>	<p>Frequency count of target behaviors during observation</p>	<p>The present study lends limited support for the use of social stories to increase social</p>

<p>initiation in children with Autism and Asperger's disorder' (Hanley-Hochdorfer, Bray, Kehle &amp; Elinoff, 2010)</p> <p>Multiple baseline design across participants</p> <p>OR</p> <p>'Before-after trial in same subject' case study</p>	<p>use of social stories to increase the prosocial behaviors of verbal initiations and contingent responses in students with either Autism Spectrum Disorder or Asperger's"</p>	<p>Asperger's) – 3 males, 1 female</p> <p>Age range – 6 years – 12 years</p>	<p>story highlighting targeted behaviors four times per week in either a quiet corner or hallway by a trained 'reader'</p> <p>Readers implemented the social story no more than 15 minute before lunch</p>	<p>periods - observations were conducted approximately three times per week in lunch</p> <p>Target behaviors:</p> <p>Verbal initiation</p> <p>Contingent responses</p>	<p>and communication behaviors with individuals with ASD and increases in frequency of targeted behaviours were minimal</p> <p>P1: Data not reported due to being uninterpretable because of a mean and SD of 0 for baseline data</p> <p>P2: 0.92-1.27</p> <p>P3: 3.22-5.15</p> <p>P4: 6.73-6.78</p>
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## **Discussion**

This systematic review aimed to determine the effectiveness of social stories on social communication and verbal initiation for children with ASD. Three studies were used within this review all of which highlighted a positive correlation between the use of social stories and improved social communication and verbal initiation.

Children with ASD often face difficulties with social interactions which can be brought about by a broad range of different subskills. Subskills including not knowing how to initiate or maintain communication, difficulties with understanding and using non-verbal forms of communication, such as eye contact, facial expressions and body language, and struggling with interpreting others thoughts and feelings (Golzari, et al, 2015). Research has highlighted that impaired social skills and socialisation can impact upon a broad range of areas and occupations in a child's life including, cognitive development, social engagements, academic engagement and success, and play (Delano & Snell, 2006). It is due to the impacts upon important childhood occupations that Occupational Therapist must consider the use of complimentary therapies to improve skills in social communication and verbal initiation in order to develop overall social skills. Previous research has begun to highlight the potential reasons why social stories may be so beneficial for children with ASD (Delano & Snell, 2006). Primary reasons identified include that they help children to 'understand social situations by providing detailed information about social events that children with ASD are unaware' and they 'help children with ASD to manage their behaviours by providing exact descriptions of what is going on in a story, and of when, how, and why the events described occurred' (Delano & Snell, 2006).

All three studies had merits which support the validity of the positive findings. All studies observed, assessed and provided data for each participant individually, this would benefit the overall findings as it ensures no key information was likely to be missed. The three studies also all followed the same guidelines in creating their social stories which was set by Gray and Garand (1993), this promotes validity and reliability of the results as social stories remained constant over the studies. All of the studies provided information regarding follow up data and provided indepth explanation of the participants including information about their perceived and reported social deficits.

Although all three studies demonstrated merits they also lacked strongly in some areas and the overall limitations of the studies reduced the validity, reliability and generalisability of the results. The small sample size of all three of the studies made an impact upon generalisability. Combined there were only 12 participants in total which is not enough to be able to generalise the results to the wider population. In addition, out of the 12 participants there was only one female which impacts upon generalisability as we cannot be sure of whether the same positive effect would occur for females with ASD. Another limitation is the variability in intervention style, even though all three studies followed correct guidelines for creating their social stories the way they implemented them, as well as other factors of the intervention, varied. One study (Sansosti & Powell-Smith, 2008) implemented the social story through a computer and also had video modelling and occasional prompting if needed, another study (Thiemann & Goldstein, 2001) also included a semi-structured social play time into the intervention where the participants were paired with 2 other children without ASD. For these reasons it can not be said with certainty that the benefits that occurred were due solely to the impact of the social story. The frequency of the interventions also differed amongst the studies, one study (Thiemann & Goldstein, 2001) had the social story run twice per week, one study (Hanley-Hochdorfer, et al, 2010) ran four times per week and the final

study (Sansosti & Powell-Smith, 2008) ran five times per week, due to this the frequency of intervention needed for the best results remains unclear and impacts upon the overall reliability of the results. Finally, none of the studies provided the statistical significance of their results making it hard for the reader to decipher whether the intervention made a valuable difference and none of the studies had control groups, therefore it is not entirely evident whether changes would have occurred naturally over the course of the semester.

As well as limitations of the individual studies there are also limitations of the overall review which hinder upon the confidence in the accuracy of results. The primary limitation of this review is the small number of studies appropriate for inclusion, there were only three studies identified to meet all inclusion criteria, and this impacts upon the reliability of the results. Alongside this, all three studies were of low methodological quality, only level four studies. Another limitation is that this review did not discuss all themes which were included in the studies, only specific relevant themes were chosen and reported. Finally, there was only one reviewer for this review which could cause bias of the results and the information presented.

Social stories is a therapeutic intervention which can be easily incorporated into practice with children with ASD. Social stories are often non-confrontational for children with ASD and can be adapted to suit the child's needs, skill level and interests (Golzari, Alamdarloo & Moradi, 2015 & Delano & Snell, 2006). Social stories are often quick to administer (approximately 5 minutes) and provide opportunity for participants to practice repeating social phrases and verbalising initiations for social engagement (e.g., "Will you play with me?" or "Hi, my name is, can I sit with you?").

Overall social stories are a relatively harm-free therapeutic intervention which may provide promising results in increasing social communication and verbal initiation skills in

children with ASD however due to vast limitations of the studies the results must be taken with caution and more research is required to promote confidence and accuracy in the intervention.

### **Clinical bottom line**

Social stories are a complimentary therapy used for children with ASD which is becoming increasingly popular as more research becomes available. There is limited amount of moderate quality level IV evidence for the use of social stories to increase social communication and verbal initiation for children with ASD. The results from all studies demonstrated positive improvements, however these results should be taken with caution due to the limited amount of evidence, limited methodological quality, small sample sizes and variability in how the interventions were delivered.

## References

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Appendix A.

Example of Emcare database search

▼ Search History (5)

View Saved

<input type="checkbox"/>	# ▲	Searches	Results	Type	Actions	Annotations
<input type="checkbox"/>	2	(Child* or adolescen*).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword heading word]	947863	Advanced	<a href="#">Display Results</a> <a href="#">More ▼</a>	 <div>Expand</div>
<input type="checkbox"/>	3	(Autism or ASD or Aspergers).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword heading word]	35039	Advanced	<a href="#">Display Results</a> <a href="#">More ▼</a>	
<input type="checkbox"/>	4	(Social communicat* or language).mp. [mp=title, abstract, heading word, drug trade name, original title, device manufacturer, drug manufacturer, device trade name, keyword heading word]	117575	Advanced	<a href="#">Display Results</a> <a href="#">More ▼</a>	
<input type="checkbox"/>	5	1 and 2 and 3 and 4	18	Advanced	<a href="#">Display Results</a> <a href="#">More ▼</a>	

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## Appendix B.

### PRISMA flow chart extracted from Covidence

