



# A Scoping Review of Musically Augmented Social Stories as A Strategy for Work with People with Autism



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## Abstract

**Background:** Social stories have been used as an intervention strategy in work with people with autism since the early 1990's. Social stories have been used as a standalone intervention, and as an element incorporated in psychotherapy, by specialist child and adolescent mental health and disability nurses. The evidence base for the efficacy of social stories has progressively grown and can be stated as supporting ongoing use. While the use of music to increase the level of fun of, and recruit participants into being active agents in, the intervention makes sense no reviews were identified to inform judgment of the state of evidence related to the use of musically augmented social stories.

**Aim:** To conduct a scoping review of musically augmented social to determine the state of evidence to support the intervention.

**Method:** A scoping review was conducted of peer reviewed papers published between 2000 and 2019.

**Conclusion:** The evidence base, while very small, is promising, supports the need for further research and is encouraging for this combination of art and therapy in musically augmenting social stories.

**Keyword:** Social stories; Musically augmented social stories; Autism; Autism Spectrum Disorder; Singing

## Introduction

Carol Gray introduced social stories as an intervention to work with people with autism in the early 1990's [1-3]. Social stories are short visually augmented stories designed to provide a complete chunk of social information that includes a clear description of context, perspective statements of those involved that describe the typically attributed qualities of motivation and changes of feeling related to action, description of possible actions and ways to navigate the situation, cooperation sentences that identify the help that can/will be provided by others and control statements that relate how the story can be recalled and pulled into action [4]. Gray provided a description of not only the types of sentences to be included, but also the suggested ratio of no more than one directive sentence to every two of the other sentence types, to prevent the story becoming merely a to-do list [4].

Social stories have been readily adopted as they fit with the underlying thinking and information processing style characteristic of people with autism [5] and the ease of implementation and the unobtrusiveness of the intervention [6]. While the behavioural symptoms of Autism Spectrum Disorder (ASD) are impaired social communication and restricted and repetitive interests, activities and behaviors [7] in terms of psychotherapy the more informative difference between an autistic style of thinking and the neurotypical thinking is the underlying cognitive processing triad of impairment/difference [8]. The potent combination of impaired/reduced theory of mind, impaired linguistic processing with a relative strength in visual processing and impaired abstraction underpins the behavioural traits of ASD. Social stories provide a complete chunk of visually augmented information

that can be cued, complete with a concrete discussion of the perspective of others and so theoretically provide an ideal scaffold to assist with negotiation of tricky social situations for people with ASD. Social stories have been used in isolation and as part of treatment packages [9]. Social stories have been incorporated into modified psychotherapeutic approaches for working with people with autism [10]. While originally conceptualized as an individual story [4,11] social stories have also been used in group settings with a shared story [2].

Several reviews and meta-analyses of the efficacy of social stories have been conducted. The bulk of the research has been conducted with children and adolescents [3].

Two reviews were conducted in 2010 [2,6]. A meta-analysis of single-subject research included 18 studies that were conducted from 2002-2009 that involved a total of 47 subjects, all of whom were children, with an age range of three to 15 years [10]. Overall effectiveness was described as low to questionable and it was noted that efficacy was greater in targeting the reduction of problem behaviors than in teaching skills. Efficacy was also greater if the participant with ASD was recruited into being an active agent in his or her own intervention. It was noted that the efficacy of social stories to support people with autism in novel situations, or transitions, had not been studied despite being suggested as potential targets of intervention originally by Gray. It was identified that efficacy was lower in studies that did not include checks of comprehension. The second review in 2010 was a systematic review of controlled studies that involved six studies conducted between 2002-2006, all in the United States of America [2]. In total 135 participants were included in the combined studies with an age range of four to 14 years. It was found that while the quality of the studies was relatively poor, with identified limitations such as lack of blinding, that in five of the six studies social stories were attributed as resulting in statistically improved outcomes. In all of the studies the story was used for a group and not individualized.

Another review and meta-analysis of single-subject studies was published in 2014 [1]. The descriptive review included 32 identified studies, and this was combined in the same paper with the meta-analysis that included data from 22 studies. In total there were 70 participants in the combined studies, with no studies of adults identified. Of the studies 78% were conducted in a school, health center or other institution. While the descriptive review concluded that social stories were effective, the conclusion from the meta-analysis was that effectiveness was questionable. Combining these conclusions, the authors described social stories as, "a promising practice that warrants future research" [1].

A further two reviews were published in 2018 [9,12] conducted a systematic review that included 22 single-case research design studies. The total numbers of the participants in the study were 57 with a range of one to six participants per study. The age range of participants was three to 15 years. The reported settings of the studies were 78% school setting, 18% clinical settings and

4% in the home setting. Through the calculation of non-overlap indices, it was concluded that 32% of the studies showed strong or moderate evidence of efficacy and that, "overall social stories interventions are deemed effective for individuals with ASD" [12]. It was noted that considerable variations existed among the identified studies. The second review published in 2018, by Karal and Wolfe was a literature review that included identified studies published between 1993 and 2015 in peer reviewed journals searched at title and abstract level, where study participants were 'students with ASD'. Twelve studies deemed to be relevant were identified and reviewed. In total there were 31 participants in the identified studies with an age range of three to 13 years. The settings where the studies were conducted were 83% school and 17% medical or research clinic. There was reported wide variation in the type of stories and the number of times the stories were provided to participants in the studies. It was concluded that, "social story interventions can have a positive impact on the social interaction of students with ASD" [9].

Overtime the confidence in the efficacy of social stories as an evidence-based intervention has increased. The target of the intervention to decrease problematic behaviour has greater support than when used as a mechanism to teach skills. It is clear that further research is required to consolidate the evidence base. In autism research in general, there is a marked deficit in research with adults [13]. This is the case with social stories. The research related to social stories is also skewed to intervention conducted in the school or clinic setting, with a clear need for more home-based intervention studies. Despite the wide use of social stories and growing body of evidence, no reviews were identified that explored the use of music to augment the social story.

Music therapy is commonly used in work with people with ASD and has been identified to be efficacious [14]. Kokina and Kern [6] reported an increased efficacy of social stories where the participant was recruited as an active agent in his or her own intervention. This is plausibly aligned to the notion of becoming a co-conspirator that is often evoked in Narrative Therapy [15]. Narrative Therapy is underpinned by the proposition that just because problems are serious it doesn't mean that you can't have fun working on them [16]. For people who like music it plausibly follows that combining music with the social story, through development of the story into a song and musically accompanying it, would be a potential means of recruitment into active involvement in the intervention and building increased engagement through the element of fun. This augmentation would be consistent with the aim of integration of social stories into therapy [5]. In the absence of any other identified published reviews a review was conducted with the aim to explore the available evidence to determine what is known of the efficacy of musically augmented social stories.

### Method

A scoping literature review was completed [17] to identify peer reviewed publications related to the use of music to augment

social stories. Searches with the key term's social stories and song and autism; social stories and music and autism; social stories and music and ASD; and social stories and music and aut\* were used without limits on the search field. The databases CINAHL, Medline, AMED and PsycInfo were searched from January 2000 until May 2019. The limit of English language was applied (see Table 1 for return results). Abstracts were viewed and studies that did not explicitly address the search criteria of peer reviewed studies or discussion papers related to the use of music to augment social stories were excluded and duplicates removed (Figure 1). A pearl growing strategy was utilized where reference lists of the

identified published papers were examined to identify other papers within the search parameters not previously identified [18]. Four papers were charted and included in the review.

Table 1: Search Results.

Search Terms	Search Returns
social stories and song and autism	4
social stories and music and autism	15
social stories and music and ASD	0
social stories and music and aut*	17

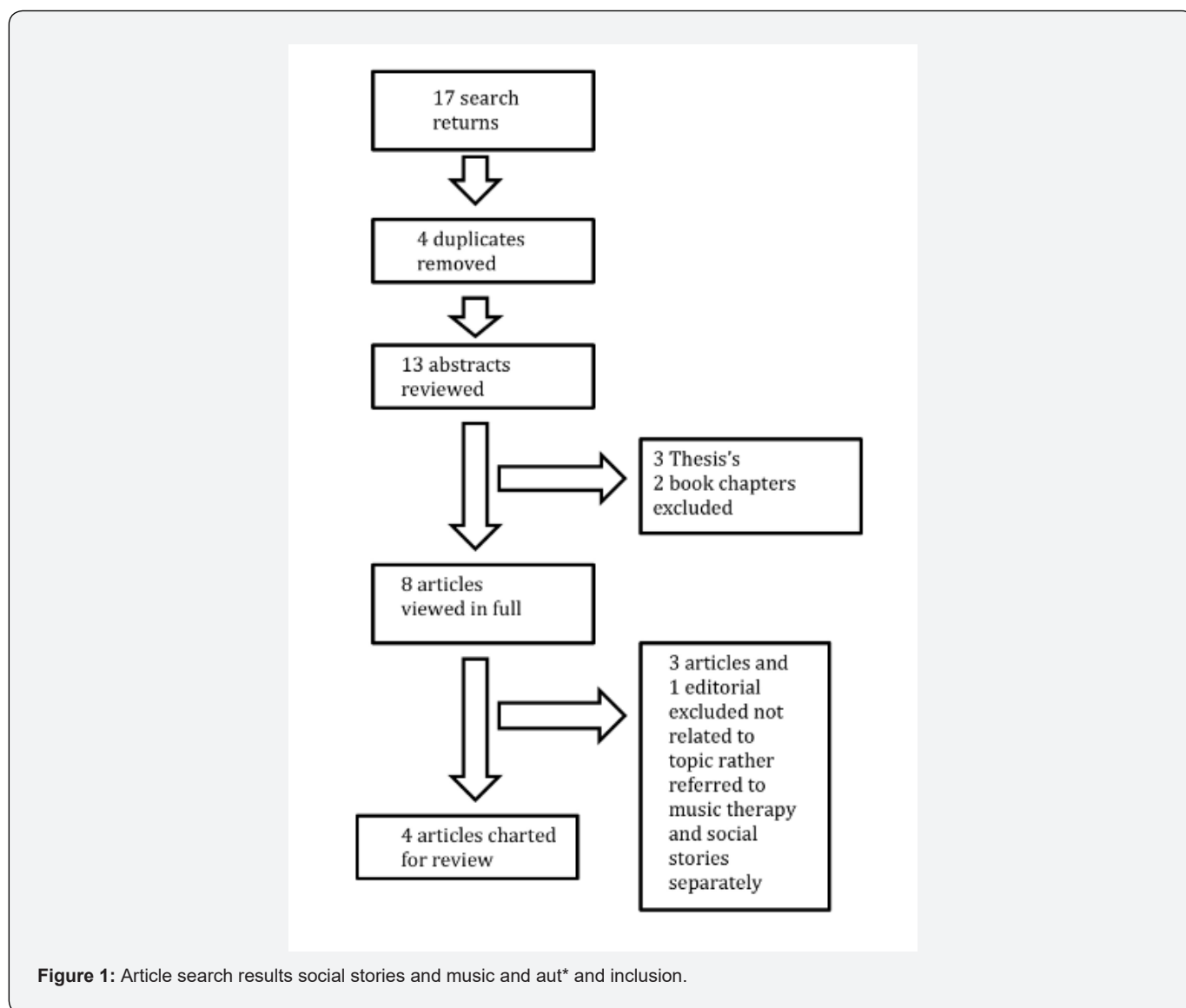


Figure 1: Article search results social stories and music and aut\* and inclusion.

Findings

The search social stories and music and aut\* included the returns from each of the other searches combined and two additional returns were added. These extra returns were one

further book chapter in which music therapy and social stories were discussed separately and a paper on creation of digital stories to enable story telling in participants with dementia. In total four papers were identified that focused on using music and singing to augment social story use with people with autism. A

review of the reference lists of these papers did not identify any further publications. All the included studies focused on children or young people. Three of the four studies aimed to determine efficacy as the primary focus, either in comparison to read social stories or no intervention [19-21]. These three studies included 37 participants in total with an age range of six to 21 years. Of these participants 35 were male and two were female. The fourth study included three female early childhood teacher participants and was aimed at the exploration of the teacher's perception of whether a group social story song was effective and the experience of being trained in the use of the song by a music therapist [22]. Two of the studies created individualized stories for the participants [19,20]. Two of the studies used a group-

based approach with a non-individualized story. One of these studies created a story to target each of the three subcategories of the outcome measure focused on a domain of social skill [21]. The second of these studies created a single story to be used with all the students based on a participant teacher's identification of a general need [22]. The context of the intervention was school for two studies [19,22] the participant's home one study [20] and summer camp for one study [21]. To augment the social story and create the song in two of the studies original music was used [19,21]. In the other two 'piggybacking' was used where the music used was from another popular song [20,22]. All of the studies were conducted in the United States of America (USA). These papers were charted (Table 2).

Table 2: Charted studies.

Article/ Location	Method	Participants	Findings	Limitations
Brownell D [19] USA (University of Kansas)	Single case experimental multiple baseline design with counterbalanced treatment order ABAC/ACAB A= baseline, B reading the social story, C singing the social story. Five days of data collection collected for each phase in the school setting. Individual social stories designed for target behaviors selected with teaching staff. Original music. Student taken from class and story read or sung once per day. Singing was accompanied by guitar playing. Teachers collected data.	Four males, six to nine years old. Each spent a portion of the school day in a special class for children with autism. Each had demonstrated a previous positive response to music and had music therapy in the past.	Baseline to a treatment condition (both first and second baseline) was significant on all occasions across the four participants. In only one participant was there a significant difference between reading and singing, with less occurrence of the target behavior following the singing phase.	It is of note from the visual representation of occurrence of the target behavior that it appeared generally lowest in the fourth treatment for all participants irrespective of whether this was singing or reading the story. In the participant in whom the significant difference was identified in which singing produced a greater reduction in the target behavior singing was the final treatment. The author did not acknowledge this. The author did acknowledge the limitation of five days only for each phase and a perception that this led to some erratic data. The claim was made that there was no order effect as consistently occurrence were lowest in the singing phase. This may be skewed using mean data only to interpret this, based on the observation of the visual data presented? The descriptive data is not presented.
Pasiali V [20]. USA (university of Kansas)	Single case experimental design ABAB. A=baseline and B singing the social story. In home setting. A parent collected the data. Seven days of data collection occurred for each phase. The researcher identified and defined the target behavior. The social story was used as lyrics in a song piggybacked on familiar music. The song was accompanied by guitar playing and participants were encouraged to participate with a shaker egg or maracas.	Two males and one female, seven to nine years old. Described as having 'high functioning' or 'mild impairment'. Positive response to music, but no music therapy experience.	In two of the three participants there was a statistically significant reduction between the first baseline and treatment. One participant experienced a statistically significant reduction between both baselines and both treatment phases. One participant experienced no statistically significant change from baseline to any treatment phase. All participants experienced a reduction in occurrence of the targeted behaviour from baseline one to follow up at three weeks on parental report	The author acknowledged the "volatility of family life schedules" and unforeseen events disrupted the experimental phases and created many confounding variables. The limitation of parent report (separate to data) to support the claim of a reduction at three weeks post experiment was not acknowledged, however general potential parent bias related to investment in the therapy in data collection was.

<p>Schwartzberg E and Siverman M [21]. USA</p>	<p>Randomized between the intervention of a music-based social story and a control of a read social story across three subgroups in each of the intervention and control based on the three subcategories of the Bellini and Hopf's 2007 Autism Social Skills profile, which was used as the main outcome measure. A secondary measure of comprehension was used. Conducted in a group setting with six groups in total at each of the camps. Intervention was for three days in total. The social stories were written to target each of the three subcategories of social reciprocity, social participation, and detrimental social behaviors. In the music group the story was used as lyrics and paired with original music. Pre and post test scores for each participant were compared.</p>	<p>30 participants with 'autism' aged nine to 21, of which 29 were male and one female. Attendees of three one weeklong summer camps.</p>	<p>Statistically significant difference was found between subcategories, but no significant difference was identified between reading and singing the story. Comprehension improved over time with a higher post test score reported. It was not presented as an inferential analysis, so it is not known whether this increase in comprehension was statistically significant.</p>	<p>Large drop out acknowledged with only 30 complete sets of data out of 87 subjects who began study. This had a corresponding effect on the power of the study. The brevity of the intervention was also acknowledged as a limitation.</p>
<p>Fees B, Holmberg T, Teagarden J and Delreal, D [22]. USA (University of Kansas).</p>	<p>Focus groups pre and post the intervention designed to train early childhood teachers to use social story songs. One social story song was used focused on waiting. The lyrics were set to the music of a popular song (piggybacked). The story was read and sung at least once a week in a group session and then use promoted as indicated by the teachers. The intervention spanned 18 continuous days. There was pre intervention formal training provided.</p>	<p>Three early childhood teachers in a school on a military base who conducted part day classes inclusive of children with "autism".</p>	<p>Teachers were reported to discuss the intervention as being "effective" in prompting appropriate individual and collective class behavior; however there were inconsistencies in how the intervention was applied between the teachers.</p>	<p>The limited number of participants was acknowledged as a limitation. A further confounding variable noted was the high student turnover related to being on a military base and the potential interaction of this with a brief intervention.</p>

**Effectiveness**

All of charted studies identified a perception that musically augmented social stories were effective and that many of the participants readily engaged with the intervention, based on the experience of the researcher, or in the case of Fees et al. [22] (2014) the teacher participants. Two of the studies compared an intervention to a baseline of no intervention. Bronwnell [19] established that a social story resulted in a statistically significant reduction in target behaviours. No difference was established between reading the story or musically augmenting the story through singing and guitar accompaniment. In the study by Pasiali [20] two of the three participants experienced a statistically

significant improvement from baseline to the treatment phase of the guitar accompanied sung social story in at least one phase of the study. One of the participants did not experience a statistically significant improvement from baseline to treatment in any phase of the study. With the acknowledged limitation in each study of a small sample size, from the limited studies conducted it can be stated that musically augmented social stories appear more efficacious than no intervention. It is of note that the two studies identified both had a positive response to music as an inclusion criterion [19,20]. This inclusion criteria of liking music conditions the statement of efficacy at this time to efficacy with people who like music.

No difference was established in the two studies that compared the use of reading and musically augmenting the story [19,21]. In the largest of the studies an added limitation of a very short intervention of three sessions was also acknowledged as potentially diminishing the scope of the study to detect differences between groups as the treatment effect was potentially reduced overall [21].

## Discussion

This review has identified that musically augmented social stories, for those with ASD who like music are more efficacious than no intervention and are not less efficacious than a traditionally read social story. Of the studies identified in the scoping review, only the study by Brownell [19] was included in the reviews of studies referred to in the introduction. Brownell [19] was included in two of the reviews [1,6]. Bozkurt and Vuran [1] viewed the combination of music with the story as a potentially confounding variable in their determination of efficacy of social stories. Kokina and Kern [6] described Brownell's intervention as, 'an unusual musical format of social story delivery'.

The findings of this review have identified that this approach of musically augmenting social stories, while to some may appear unusual, has merit for people with ASD who like music. Plausibly the merit may come from the recruitment of the person with ASD to become an active agent in their own intervention, a position that when achieved appears to increase efficacy [6].

All of the studies identified were conducted with children and young people and were skewed to contexts other than the home. Future research is indicated with adults and in the home environment. All of the identified studies were conducted in the USA. Three of the studies were affiliated with the same university.

The body of evidence related to the efficacy of the use of social stories with people with ASD has grown and at this point support ongoing use of the intervention. There is great coherence between the thinking and information processing style of people with ASD and the intervention design [5,10]. This scoping review has identified the musically augmenting social stories does not detract from the efficacy of the social story and future use of this approach is encouraged.

## Conclusion

While the evidence at this point in time is limited, it can be stated from what studies have been completed, that the use of musically augmented social stories with people with ASD are more effective than no intervention and no less effective than traditionally read social stories. Further research is needed to expand the base of evidence. At this point there have been no studies with an adult population. Further research, while needed in all contexts, is particularly needed for intervention based in the home. The volume of studies is too small at this time to determine whether there is a difference between use of original

music to augment the singing of the social story or 'piggybacking' and whether one approach is more effective or whether they are equally effective.

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