

Using a Social Story to teach an eight-year-old girl with Autism a socially appropriate way of eating: A case study

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Abstract

Few research studies have been conducted to investigate the use of a Social Story as the sole intervention in changing inappropriate behaviours in children with autism. Most of the studies that used Social Stories as an intervention showed limitations like improper story construction (Appendix G), unsatisfactory design (AB design), and most lacked generalisation and maintenance as described in the literature review.

This study assessed the utility of a properly constructed Social Story (Appendix G) as the sole intervention to change a dangerous and socially unacceptable way of eating in an eight-year-old girl with autism. Because of her unusual and sometimes aversive way of eating, often typical of children with ASD, morning tea and lunch times at the mainstream school she attended posed safety as well as social issues. The decision was made to use a changing conditions design (ABC).

Data was collected in two ways: through frequency counts during observations done at morning tea and lunch times and data collected at unstructured and informal interviews with seven peers. The results indicated that the Social Story as the sole intervention was powerful and significant changes were seen as the participant started to eat in a safer and socially more acceptable way. However; this change did not result in making her eating safe at *all* times and it became necessary to introduce the Phase C of the design. During the C phase the participant mastered the desired eating behaviour. The participant also managed to generalise this desired behaviour when another teacher aide was introduced. After six weeks the desired way of eating was maintained. The Social Story as intervention used with a changing conditions design was in this case successful to change, generalised and maintained the desired way of eating.

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Introduction

Over the past 20 years increasing numbers of professionals have started to refer to autism as a spectrum disorder. This is directly linked to the growing understanding that autism is not a single condition but it is rather an umbrella term used for a range of disabling behaviours, including autism, Asperger syndrome, Rett syndrome, atypical autism, pervasive developmental disorder, and childhood disintegrative disorder. Autism Spectrum Disorder (ASD) differs both in intensity and frequency, and can change and vary with development (Schopler, Yirmiya, Shulman & Marcus, 2001).

Recent studies reported epidemiological increases in the prevalence of ASD (Iovannone, Dunlap, Huber & Kincaid, 2003). Greater awareness of the disability, changes in the diagnostic criteria, and a real increase in the incidence of ASD are all given possibilities for the increase in diagnosis (Ali & Frederickson, 2006). The reality is that ASD has shifted from a low-incidence disability to a significant challenge, especially in the education sector where interventions for these children have to be put in place. As the number of children identified with ASD is continuing to grow, researchers and educators have to investigate possible interventions that teachers and other professionals can use successfully in the classroom and other inclusive settings. These investigations have, over the past two decades, resulted in an explosion of literature: a mix of scientific social research, anecdotal evidence, and unproven theories (Griffin, Griffin, Fitch, Albera, & Gingras, 2006).

In their investigations to establish a research basis for autism intervention, Schopler et al. (2001) came up with three research and intervention categories: the medical research category that seeks cause and cure, the habilitation category that seeks to apply optimum adaptation and the cultural

category that makes special contributions by changing the environment. The habilitation category is the most relevant category for families and educational professionals who have accepted autism as a chronic developmental disorder and that, with appropriate education and community acceptance, people with ASD can lead a satisfying life.

Sitting well imbedded in this third category is the use of Social Stories to help students with ASD to lead satisfying lives in an inclusive society. The concept of Social Stories as intervention was developed by Carol Gray in 1993 to facilitate interpretation of social situations for individuals with autism. (Iovannone, et. al., 2004). Gray (2000) states that the goal of a Social Story never should be to try and change the individual's behaviour. A positive behaviour change takes place because of the individual's improved social understanding of events and expectations (Ali & Frederickson, 2006).

As more students with ASD are educated in inclusive settings, well-researched intervention strategies to teach social skills to children with ASD need to be put into place. More research into the use of Social Stories will refine this strategy to maximise its potential (Crozier & Sileo, 2005); therefore the purpose of this study is to expand the scope of research on the use of a Social Story to teach socially appropriate eating habits in a child with ASD.

This is especially relevant in the New Zealand context where the ecological model is foundational to inclusion into mainstream education (Ministry of Education, 2000). The three important points in this ecological model, based on the work of Bronfenbrenner (1979), are that the child is at the centre, the family setting has the greatest influence on the child's development although other community settings also play an important role. It acknowledges that a child affects, as well is affected by, the settings in which they spend time in (Ministry of Education, 2000).

As a special needs coordinator I have the overall responsibility for the well-being of a girl with ASD who attends the school where I am working. Because of her unusual and sometimes aversive way of eating, often typical of children with ASD (Ledford & Gast, 2006), morning tea and lunch times have become problematic with an escalation in tantrums, caused by mainly two issues.

Firstly, her way of eating is socially unacceptable to her peers and therefore they avoid her during morning tea and lunchtime, which, in turn, socially isolates her. Her peers not only avoid her when she is eating, but sometimes also stare and laugh at her. When she makes vomiting noises, gags, vomits or an adult needs to hook food from her mouth for safety reasons, the peers openly show their aversion.

Secondly, for her own safety she has to eat under adult supervision. This has an impact on her independence and emphasises the fact that she is so different that she needs an adult to supervise her.

Research Questions

Being responsible for Jan's (pseudonym) safety and social interaction at school, it became a priority for me to teach Jan appropriate eating skills and this was written as a goal in her individual educational plan. The hypothesis was developed that a Social Story could change her socially inappropriate eating and the following questions were formulated:

Would a Social Story as the sole intervention be effective to teach this eight-year-old girl with ASD a more socially acceptable way of eating? If the desired behaviour is taught through the Social Story as the sole intervention, would the desired behaviour be maintained over time and would any generalisation to another person and environment take place?

If a Social Story as the sole intervention is not successful to bring about the desired eating behaviour, what other intervention could be put in place to achieve the desired eating behaviour? What could be added to the Social Story to make the intervention successful? One option would be to add a verbal prompt in which case the methodology should include a changing condition design.

Other relevant questions to consider were whether more socially appropriate eating habits would enhance Jan's social interactions with her peers and lead to greater independence.

Key Concepts

To investigate these hypotheses and research questions, it is important to clarify the following key concepts as applied in this study:

Autism Spectrum Disorder

In 1943 Dr. Leo Kanner introduced the label *early infantile autism*. At the same time an Austrian scientist, Dr. Hans Asperger, described a milder form of autism that became known as Asperger syndrome (Bernad-Ripoll, 2007; Ledford & Gast, 2006). Despite the efforts of numerous researchers autism remains a unique and perplexing disability.

The Diagnostic and Statistical Manual of Mental Disorders – Fourth Edition (Text Review) (DSM-IV TR) (APA 2000), defines autism as a pervasive developmental disorder marked by social and communication impairments along with a restricted repertoire of activities and interests.

In line with this definition, researchers have agreed that autism is characterised by severe social interaction deficits (Adams, Gouvousis, VanLue & Waldron, 2004; Crozier & Sileo, 2005; Greenway, 2000; Scattone, 2007). This includes impaired social interactions, restricted interests and activities and perseveration, both verbally and non-verbally, which is caused by a lack of social understanding (Griffin et al., 2006). In children with autism, these impairments commonly result in problem behaviours that can negatively affect the child's ability to participate in family and community life and to access educational opportunities (Crozier & Tincani, 2005). The challenging behaviours may serve as a form of communication to compensate for the lack of language and social skills these children experience (Delano & Snell, 2006).

Autism, however, is not a single condition; rather, it is a spectrum disorder that results in individuals presenting with a wide range of abilities and disabilities. Furthermore, ASD is a lifelong disorder, usually diagnosed before 3 years of age and persisting through adulthood, with no identified etiology or cure. The deficits displayed by individuals having ASD affect the most vital aspects of quality of life, including interacting with other people, communicating ideas and feelings, and understanding what others feel or think (Iovannone et al., 2003).

Relevant to this study is the importance of impairments of social interaction which Lorna Wing (1980) divides into the following four categories: The *aloof group* exhibits the most common type of social impairment and they may behave as if other people do not exist. They make little or no eye contact and often do not respond when they are spoken to. This group has a lack of facial expression except when they experience extreme joy, anger or distress and do not respond to cuddling. They often communicate through gestures and they will pull their carers' hands towards a wanted object. They seem to be in a world of their own. The *passive group* is the least common group and individuals may accept social approaches, e.g. they may meet the gaze of others and they may become involved as a passive part in social activities. The *active but odd group* forms the third category. Individuals in this group make active approaches to others but make that contact in strange and odd ways, e.g. their eye contact may be poor although they sometimes may stare at people and they may hug or shake hands too hard. The fourth group is the *over-formal, stilted group*. Their characteristic behaviour patterns are usually seen later in life and are common for most people at the higher functioning end of the spectrum.

Theory of Mind

Simon Baron-Cohen, Alan M. Leslie and Uta Frith (1985) suggested that children with autism do not employ a Theory of Mind (ToM). According to this hypothesis, children with autism lack the ability to construct a social world that is guided by thoughts, intentions, desires and beliefs (Carlisle, 2007). They lack an understanding that others have their own ideas, experience things differently, and have different plans and points of views. This results in difficulty to understand the expectations of others and an inability to predict how others will operate in social situations. This is also sometimes referred to as *mind-blindness* (Ali & Frederickson, 2006; Wallin, 2004; Kuoeh & Mirenda, 2003). Social Stories attempt to address the ToM impairment by giving individuals with ASD some insight into the thoughts, emotions, and behaviours of others (Wallin, 2004).

Social Stories

A Social Story is a brief, individualised, short story that describes a social situation and provides specific behavioural response cues through visual aids (drawn or photographed sequences of events) and text that the child with autism is likely to encounter in a given setting. The story tells which behaviour is expected, how to attain the behaviour and what the reward is for that behaviour in a particular circumstance (Welton, Vakil & Carasea, 2004).

As mentioned before, Social Stories also attempt to address the ToM impairment by providing instruction regarding the *who*, *what*, *when*, *where* and *why* of a social situation. It therefore helps to ensure a child's accurate understanding of social information in a given setting and provides instruction for the child to initiate, respond to, and maintain appropriate

social interactions (Sansosti et al. 2006) Better social understanding may lead children with ASD towards better social interaction that could result in more appropriate social behaviours and acceptance (Kuo & Mirenda, 2003; Ali & Frederickson, 2006; Wallin 2004).

Better social understanding and interaction are foundational to Gray's principle (2000) that a Social Story should never be used to change behaviour, but instead to guide towards better social understanding and socially appropriate behaviours.

In describing a Social Story, Gray (2004) states that:

A Social Story is a *process* that results in a *product* for a person with ASD.

First, as process, a Social Story requires consideration of and respect for the person with ASD. As a product, a Social Story is a short story, defined by specific characteristics that describe a situation, concept, or social skill using a format that is meaningful for people with ASD. The result is often renewed sensitivity of others to the experience of the person with ASD, and an improvement in the response of the person with ASD.

In its original form, three types of sentences, *descriptive*, *directive* and *perspective* were used. Descriptive sentences describe the social situation in terms of relevant social cues; directive sentences specify an appropriate behavioural response; and perspective sentences describe the feelings and responses of the student or others in the targeted situation. Perspective sentences should only be rarely used to describe the internal states of persons with autism.

Over time the suggested format for a Social Stories has become more sophisticated. Gray (2004) now describes a fourth basic sentence type: *affirmative*. Two other types of sentences can also be included: *control* and

cooperative (Reynhout et al., 2006). Gray also defined the relationship between different types of sentences (Appendix G), suggesting that a Social Story should have a ratio of two to five descriptive, perspective and / or affirmative sentences for every zero to one directive sentence (Delano and Snell, 2006).

The use of illustrations was not initially recommended; however, it has now been shown as beneficial to social understanding (Rust & Smith, 2006), and is consistent with research that indicates that people with autism perform significantly better on picture priming tasks than on word priming tasks. (Smith & Gillon, 2005).

Literature Review

The following electronic databases were accessed during the literacy search: Education Research Complete, EBSCOhost, ERIC (Online: EBSCO), MasterFILE Premier, and PsychINFO, using the descriptor 'Social Stories' and 'Autism', resulting in 22 articles. Websites for Social Stories, and psychological and educational theories were also searched. Access to the IHC library in Wellington resulted in five more articles as well as two of the most recent books published on Social Stories. Ten books were borrowed from the University of Canterbury Library.

The place of Social Stories in Social Constructivist and Social Learning Theories

Social Stories as an intervention and ToM as the necessity for an intervention both sit well embedded in Vygotsky's social constructivist theory where emphasis is placed upon interaction between the learner and others. Dialogue, that becomes the vehicle that share ideas, is often between the learner and a more knowledgeable other; usually the teacher. Vygotsky called the process when a teacher takes on this role in a planned way, *scaffolding*. It involves giving support to learners at the appropriate time and level to meet the needs of the individual. Vygotsky used the term *zone of proximal development (ZPD)* to indicate the difference between what a learner can do without help and what the learner can do with help (Pritchard, 2005).

Bandura (1977) also operated from within this paradigm as he developed his Social Learning Theory. This theory explains human behaviour in terms of continuous reciprocal interaction between cognitive, behavioural, and

environmental influences. Bandura stated: “Learning would be exceedingly laborious, not to mention hazardous, if people had to rely solely on the effects of their own actions to inform them what to do. Fortunately most human behaviour is learned observationally through modelling...” (p. 22). Processes underlying observational learning are: attention, retention, motor reproduction and motivation. Because of the inclusion of all of these aspects, social learning theory spans both cognitive and behavioural frameworks and is related to the theory of Vygotsky which also emphasized and centralised the role of social learning ([http: tip.psychology.org](http://tip.psychology.org), *n.d.*).

The use of a Social Story as an intervention seems to fit very well inside the paradigm created by the ToM, Vygotsky’s theory of social constructivism, and Bandura’s theory on social learning.

Social Stories combined with other interventions

Despite the rich anecdotal evidence that supports the effectiveness of Social Stories interventions with individuals with ASD, only a few studies have looked into the effectiveness of Social Stories to change inappropriate social behaviours. In general, most offer promising findings.

The investigated research into Social Stories shows a great deal of variability in the methods and procedures used. Most of the research studies used Social Stories in combination with other interventions or reinforcers, making it impossible to determine the efficacy of the Social Story as intervention.

Swaggart and Gagnon (1995) conducted the first research on the effectiveness of Social Stories as an intervention to teach children with ASD

to greet people appropriately and to share toys. They used a case study with an AB design. As is pointed out later in this study, an AB design presents with specific limitations. Their data gathering was informal and their intervention combined a Social Story with a behavioural social skills training programme to successfully decrease inappropriate behaviours. Although the participants' behaviour improved, it is impossible to determine which intervention produced the desired behaviour (Crozier & Tincani, 2005).

Two other pioneer studies in this field was conducted by Kuttler, Myles, and Carlson (1998) to reduce tantrum behaviours, and Norris and Dattilo (1999) to improve positive social interactions during lunch. Kuttler et al. used an ABAB design and thereby avoided some of the methodological difficulties of an AB design. Although their study concluded that a Social Story as intervention showed potential benefits, it is important to note that they did not use a Social Story as the sole intervention, but combined the Social Story with a verbal prompt (1998).

Other studies where verbal prompting was coupled with Social Stories were conducted by Scattone, Wilczynski, Edwards & Rabian (2002) to decrease disrupted classroom behaviours, and Kuoch & Mirenda (2003). Kuoch and Mirenda's study were conducted with three young boys who displayed the following socially inappropriate behaviours: aggression when they had to share toys, eating problems at school, and inappropriate behaviours when playing board games with their peers. All of these behaviours became socially more acceptable, but it is impossible to determine the role that the Social Story played to reduce the socially inappropriate behaviours.

Norris and Datillo used a single-subject case study and an experimental AB design to examine the efficacy of a Social Story. The results were highly variable and inconclusive (Norris & Datillo, 1999) and a point of critique against this study is once again the use of an AB design (Reynhout & Carter, 2006).

Rogers and Myles (2001) used a comic strip in addition to a Social Story. In their report they described positive behavioural changes, but the lack of baseline data and methodological information question the validity of this study (Crozier & Tincani, 2005).

Eight other studies used a variety of interventions in conjunction with Social Stories. Hagiwara & Myles (1999) used multi-media stories in a computer-based format with three boys with autism in a single case multiple baseline design, while Bledsoe, Smith-Myles and Simpson (2003) paired Social Stories with photos of peers. Video modelling was used in combination with Social Stories in studies conducted by Scattone (2007) and Bernad-Ripoll (2007). Other interventions included response-cost systems (Swaggart, Gagnon, Bock, Earles, Quinn, Myles & Simpson, 1995), token economy systems (Kuttler et al., 1998), reinforcement systems, and prompts (Scattone et al., 2002). One of the most rigorous research studies was conducted by Thiemann & Goldstein (2001), using a multi-component intervention – written text, pictorial cueing accompanied by video feedback – with five boys with autism that were paired with children without disabilities. (Ali & Frederickson, 2006; Sansosti, 2006; Thiemann & Goldstein, 2001). Although the inappropriate behaviour improved in all but one of these above-mentioned studies, the sole role Social Stories played in achieving the success could not be determined.

Another variable in the intervention of Social Stories is the use of adapted or modified Social Stories. According to Crozier and Tincani (2005) a modified Social Story deviates from the guidelines Gray has determined in 2000. Although these guidelines are clear and specific, they still need to be verified systematically, and Gray suggested that deviations from the guidelines might be appropriate in some instances. Gray and Garand (1993) describe how Social Stories can be modified to suit a wider variety of purposes, e.g. checklist Social Stories can be taught to follow specific routines and curriculum Social Stories could be created by inserting pages

involving academic activities and generic Social Stories could be used to describe social situations (Gray & Garand, 1993).

A modified format was used by Myles and Simpson (1995). Adams, Gouvousis, VanLue and Waldron (2004) deviated from prescribed Social Story methods by targeting four behaviours simultaneously. Crozier and Tincani (2005) examined the effects of a modified social story, with and without verbal prompts. In all of these studies the goal of decreasing inappropriate behaviours was achieved, but the exact role of the Social Story as intervention is unclear.

Social Stories as the sole intervention

During the literature search the following eight studies, using Social Stories as the sole intervention, were investigated: Norris and Dattilo (1999), Romano (2002), Scattone et al., (2002), Bledsoe, Myles and Simpson (2003), Chalk (2003), Kuoch and Mirenda (2003), Adams et al. (2004). In the study conducted by Smith & Gillon (2005) a Social Story as the sole intervention proved to be successful with one of the two preschool boys. The results in all eight these studies concluded that Social Stories as the sole intervention proved to be successful, and a range of socially inappropriate behaviours improved, including inappropriate social interactions (Norris & Dattilo, 1999); disruptive behaviour at school (Scattone et al., 2002); hitting, pinching, kicking and yelling (participant 1), making sounds and throwing up (participant 2), making negative comments to peers (participant 3) (Kuoch & Mirenda, 2003); and crying, falling, hitting and screaming as a response to doing homework (Adams et al., 2004). Smith and Gillon found Social Stories as the sole intervention effective in increasing the spontaneous requests of two pre-school boys with autism (2005).

Two of these eight studies investigated the efficacy of Social Stories to improve socially inappropriate eating behaviours, and are therefore relevant to my current study. Norris and Dattilo (1999) investigated socially inappropriate behaviours during lunchtimes but not the way of eating. Of specific relevance to my study is the research conducted by Bledsoe, Myles, & Simpson (2003) on eating-related problems that included spilling food and drink, and failure of the participant to wipe food from his face. An ABAB design was used to determine the relation between the Social Story as the sole intervention and a socially more appropriate way of eating.

Despite various limitations in the areas of design, generalisation and maintenance (further described in the Method section) in these studies, almost all point towards the positive potential of Social Stories (Ali & Frederickson, 2006).

Although the research on the effectiveness of and the empirical support for Social Story interventions is limited, the available literature proves this strategy as a popular one that educators often prefer to use (Crozier & Sileo, 2005; Sansosti & Powell-Smith, 2006). According to Smith (2001) this preference developed over the last fifteen years because Social Stories focus on social understanding, they provide in the individual needs of the child, they are visual, and the naturalness of the intervention is reassuring.

The purpose of my present study was to evaluate the effects of a Social Story to teach an eight-year-old girl with ASD a socially appropriate way of eating that would also prevent her from choking.

Method

Case Study

A case study is one of several methodologies that can be used when conducting social science research. It focuses on providing rich description of the case it investigates. In case study research the researcher examines many features of one or a few cases over a period of time. A case can be an individual, groups, organisations, movements, events, or geographic units. Data is usually more detailed, varied and extensive. Case study research uses the logic of *analytic* instead of *enumerative* induction. As a result the researcher may gain a sharpened understanding of why the instance happened as it did and what can be done about it; therefore case studies lend themselves to both generating and testing hypotheses (Mutch, 2005; Neuman, 2006).

Yin mentions two situations where a case study would be the preferred method of research. Firstly when the research addresses either a descriptive or an explanatory question and secondly when the research wants to illuminate a particular situation to gain an in-depth and first-hand understanding through the use of observations and collecting data in natural settings (Yin, 2003).

For the purpose of this study, where the goal was to gain an in-depth and first-hand understanding of the role that a Social Story can play in influencing a habit in a child with autism, a case study posed to be the best methodology to use. Because this methodology was chosen, the methods that were used to collect the necessary data were observations, informal interviews and oral history. The teacher aide, who accompanied Jan from the previous school and knew her for three years, was able to provide me with a wealth of oral history.

Participant

Jan is an eight-year-old girl diagnosed with autism. Jan attends a mainstream private school. She started to attend the school at the beginning of term two of this year, transferring from a state school. At the state school Jan was supported by the teacher aide who transferred with Jan to the new school where she is mainly working with Jan. Jan is constantly supervised by either one of the two teacher aides working with her. Jan has limited verbal expression. She is able to use thirty words, but, because she struggles to pronounce the end sound of her words, her speech is unclear. Besides her verbal language Jan is also learning to communicate through the Picture Exchange Communication System (PECS) and Makaton sign language. She spontaneously uses informal gestures. In her attempt to communicate Jan also vocalises other non-word sounds. When Jan is tired or frustrated, she uses no language but only screams and makes loud whining noises when she cries.

During informal observations at morning tea and lunch, Jan exhibited some aversive, syndrome related characteristics, (Ledford & Gast, 2006), including food refusal and sensory-based eating problems. However, the main issue was that Jan stuffed her mouth with food when she was not watched and prompted to take small mouthfuls. Jan would put another piece of food in her mouth when her mouth was still filled with food. When her mouth was filled with too much food, Jan could not chew and gagged as a result. It also sometimes happened that she choked when her mouth was too full. Safety measures were put into place at Jan's previous school to ensure her safety when she was eating. Jan always had an adult next to her to control the amount of food she was putting into her mouth by either blocking the food on the plate with her hand or remove it so that it was impossible for Jan to grab another piece from the plate. The adult was also responsible to intervene when Jan gagged or choked by putting her finger

into Jan's mouth to hook out the food that caused the problem. The teacher aide reported that this often happened in the past before measures of constant adult supervision were put in place, and that she had to perform the Heimlich manoeuvre when choking was quite severe.

Overfilling her mouth was not only unsafe, but for Jan it also resulted in three major social issues. Firstly she was not allowed to eat without adult supervision. This limited her independence and was quite intrusive. Secondly, she communicated the question to her teacher aide and indicated that she did not like it when the teacher aide was assisting her to eat, while her peers could eat without help. This was reinforced during observations when she indicated that she didn't want an adult with her because her peers didn't have an adult with them. Thirdly, the gagging and choking were unpleasant for her peers to experience when they were also eating, and they would isolate Jan by avoiding sitting close by whenever she was eating. It was clear that this way of eating socially isolated Jan and that a change in her eating habits was essential if she was to be socially included.

Setting

The setting for the intervention was the eating space the children used at the private school Jan attends. During observations Jan was watched through the window of an adjoined classroom within two metres from where she was having her morning tea and lunch.

Design

There are considerable differences in single-subject designs used in the reviewed literature. The AB design where A is the baseline and B the

intervention was used by Norris & Dattilo (1999), Sansosti & Powell-Smith (2006), Scattone (2008), Scattonne, Wilczynski, Edwards & Rabian (2002), and Swaggart et al. (1995). A limitation to the AB design is that it lacks evidence of maintenance and generalisation. Another limitation is that the AB design "...is usually much weaker because the control exerted by the intervention is not as firmly evident as when changes come and go as intervention and return to baseline alternate" (Kazdin, 2001, p. 132).

The reversal design, ABAB (where A is the baseline, B the intervention, A a return to prior baseline conditions and B a repeat of the intervention) is the most straightforward and powerful single-subject design for demonstrating a functional relation between an intervention and behaviour (Cooper, Heron & Heward, 2007). However, it has been criticised as being unethical due to the withdrawal during the second A phase.

For the purpose of this study an ABAB design presents ethical questions whereas the AB design is not rigorous enough to determine the success of a Social Story as sole intervention. Therefore the decision was made to use a changing conditions design (ABC).

"A changing conditions design is used to investigate the effect of two or more treatments (independent variables) on the behaviour of the student (dependent variable). Unlike the alternating treatments design, the treatments in a changing conditions design are introduced consecutively." (Alberto & Troutman, 1999, p. 204) Should a Social Story as the sole intervention not be successful to change the inappropriate eating behaviour, another intervention should have been thought of to use as an alternative because of ethical considerations. In this study it would be verbal prompting.

During the proposal stage of this study it was planned to use a verbal prompt during C. However, during the Social Story intervention, Jan started

to indicate the 'one' of 'one bite' with her right index finger whenever she saw me at school. It therefore seemed more appropriate to use the gesture that Jan herself had introduced: indicating the number *one* with the index finger.

Because of the lack of generalisation and maintenance in most of the literature, it was decided to build generalisation into this study to extend the research on Social Stories. Generalisation was planned in two areas. Firstly, generalisation took place by introducing another teacher aide to take over the reading of the Social Story after Jan reached five consecutive days on zero. Secondly it is desirable that the Social Story is generalised to the home situation. The Social Story was therefore sent home, and the mother was asked to read it every time before Jan was going to eat.

Initially it was planned to determine maintenance of the intervention by doing a recording for four days a month after the intervention has ended. When conducting the study, generalisation was reached just before the December / January school holidays. This six week break offered the ideal opportunity to test maintenance by determining whether Jan would still follow the learnt steps when eating after the holidays.

Target Behaviour

The targeted behaviour was set after consultation with the parents, the teacher aide and the study supervisor, and was chosen for both safety and social reasons as described above. The research questions and hypotheses guided the process to determine the target behaviour. The desired behaviour was that Jan would finish one mouthful before reaching out for another. The hypothesis was that this target behaviour would result in a safe and socially acceptable way of eating.

Recording and Response Definitions

Frequency recording (Appendix E) was used to collect data and each session's data was calculated as a percentage and plotted on a scatter plot graph. Frequency recording is a process for documenting the number of times a behaviour occurs. An observer using frequency recording makes a tally mark each time a student engages in a target behaviour (Kazdin, 2001). The eating behaviour that was recorded for this study was to determine how many times Jan reached for another piece of food before finishing her mouthful.

Overfilling or stuffing was defined as filling her mouth with more than one piece of food at a time.

Because Jan did not always eat the same amount of bites per session, each session's data was converted into a percentage. Percentages were used to create the graph during all phases of the study.

Material

A Social Story (Appendix C) was developed according to the guidelines determined by Carol Gray (1998) (Appendix D).

The Social Story consisted of three pages. The first page was a title page with a photo of Jan, showing the number 'one' with her index finger to indicate that she is learning to take one bite at a time. The story included the safety aspect (*I am taking one bite at a time so I eat safely*), as well as a social aspect (*My friends like it when I take small bites*).

Photos of Jan were taken and added to the script. This personalised the

Social Story. To protect Jan and her peers' anonymity, their faces were blanked out in the attached Social Story (Appendix C). The photos added a visual dimension to the Social Story. Visual prompts and schedules are recommended to overcome a number of deficits among students with ASD, such as auditory processing, language use and understanding, organisation, understanding sequencing and memory while it relies on strengths typical of children with ASD, such as visual processing and understanding. Visual clues also present the material in a concrete and logical way (Ganz, 2007).

The written script consisted of five sentences. The sentences and the relation in which they were used followed Gray's guidelines (Appendix D). The Social Story had an introduction which stated the topic: 'Why is it good for me to take one bite at a time?' It contained a directive sentence: 'I am learning to take one bite at a time'; a perspective sentence: 'My friends like it when I take small bites'; an affirmative sentence: 'It is good to chew one small bite at a time' and a cooperative sentence: 'When I eat I will try to take small bites and swallow so my mouth is empty before I take the next bite'.

Procedure Reliability

The guidelines Gray has determined when writing and implementing a Social Story was followed to ensure content validity (Gray, 2000; Smith, 2004; Wallin, 2004). After the Social Story was written according to these guidelines, it was compared with the *Social Story Checklist*, (Appendix G). The study supervisor checked the format of the Social Story and it was approved.

The teacher aide knew exactly what procedures had to be followed during the intervention phase. She knew that she had to read the Social Story just

before morning tea and again just before lunch. She was aware that the intervention did not change any of the safety measures that were in place. During the changing condition the second teacher aide involved was introduced to exactly follow the same procedure.

Inter-observer Agreement

Initially it was thought that no inter-observer agreement was necessary as I was going to be the only person to do the observations. However; I needed to involve a colleague as co-observer as I had to work in another city for a couple of days. I discussed the target behaviour and the frequency recoding procedure thoroughly with my colleague. I made sure she understood exactly what was expected before we observed the participant and the teacher aide over a period of three days, reaching a 98% agreement.

Ethical Considerations

As Jan was not able to give informed consent, her parents gave their written consent for their daughter to be involved in this study.

The purpose of the study, Jan's role, and their voluntary participation were explained to the parents, both verbally and in writing (Appendix A). The parents signed the letter of consent (Appendix B) and they were made aware that they could withdraw Jan from the study at any time. Anonymity and confidentiality were guaranteed. The parents saw the Social Story that was used and approved of it.

The project was submitted in writing (Appendix C) to the school's Board of trustees and permission was asked for the project to be considered. They gave their consent (Appendix D) and permission to access the site. The

Board agreed that photos were taken and used if the identity of the school or the student was not revealed.

Jan's safety was of paramount importance. As her eating habits were sometimes dangerous, the safety measures that have been put in place in the past remained in place. The teacher aide blocked Jan's access to the food if she wanted to overfill her mouth. This prevented Jan from the chance to overfill her mouth. However, as an extra security measure, the teacher aide knew exactly what to do should Jan gagged, vomited or choked.

Baseline and Intervention Procedures

To determine the baseline data, Jan was observed for four days during morning tea and lunchtime to record how many times she reached for another piece of food before finishing her mouthful and how many times Jan finished her mouthful before reaching for another piece of food.

On day four of the baseline data collection the photos for the Social Story were taken, the Social Story was written, and put up on the wall above Jan's desk. Her class peers seemed to be very interested in the Social Story and the teacher aide observed that they were talking a lot about the Social Story between themselves and to Jan. A reason might have been the fact that some of them appeared with Jan on one of the photos used in the story. The teacher aide was also trained on day four on how to use the Social Story.

Four days after baseline data collection started, the intervention was put in place. The teacher aide read the Social Story to Jan every day before morning tea and lunchtime started. The intervention took place over a period of fourteen days.

Although her eating behaviour was steadily improving during the intervention, Jan still didn't reach zero for five consecutive days. As we were starting to run out of time as the December / January holidays were closing in. I made the decision without contacting the study supervisor, to introduce a changing condition because the result that was needed had to be that she *never* reached out for another piece of food while still busy with a mouthful.

After fourteen days of intervention the changing condition design was put in place. Jan managed to eat safely without overfilling her mouth for five consecutive days. With this desired behaviour established, another teacher aide read the Social Story to Jan to determine whether the desired behaviour would generalise. To determine whether generalisation would take place in a different environment, in this case the home, a copy of the Social Story was send home for the parents to read to Jan before mealtimes.

The December school holidays started after the four days of generalisation. This provided the ideal opportunity for maintenance. Six weeks later Jan was observed for five days to determine whether the behaviour has been maintained.

Although the study supervisor suggested to interview Jan's peers, I did not initially plan these interviews and they were not included in the proposal. However, during the observations, a remarkable positive change in peer behaviours was seen between baseline and the intervention phases. To investigate these social changes, unstructured interviews (Appendix G) were conducted with seven of the peers two weeks after the intervention was put in place. These seven were chosen because they were sitting in a group with her on two or more eating sessions. None of these students were observed to sit with her during the time when the baseline data was collected.

The students were interviewed individually with an open-ended question (Mutch, 2005): “Last term it seemed that Jan was sitting alone when she was eating. Why are more students sitting with her this term when she is eating?”

Data Collection

Data was collected in three different ways: unstructured and informal interviews, oral history from the teacher aide who knew Jan well, and observations at school during morning tea times and lunch.

Results and Discussion

Observations

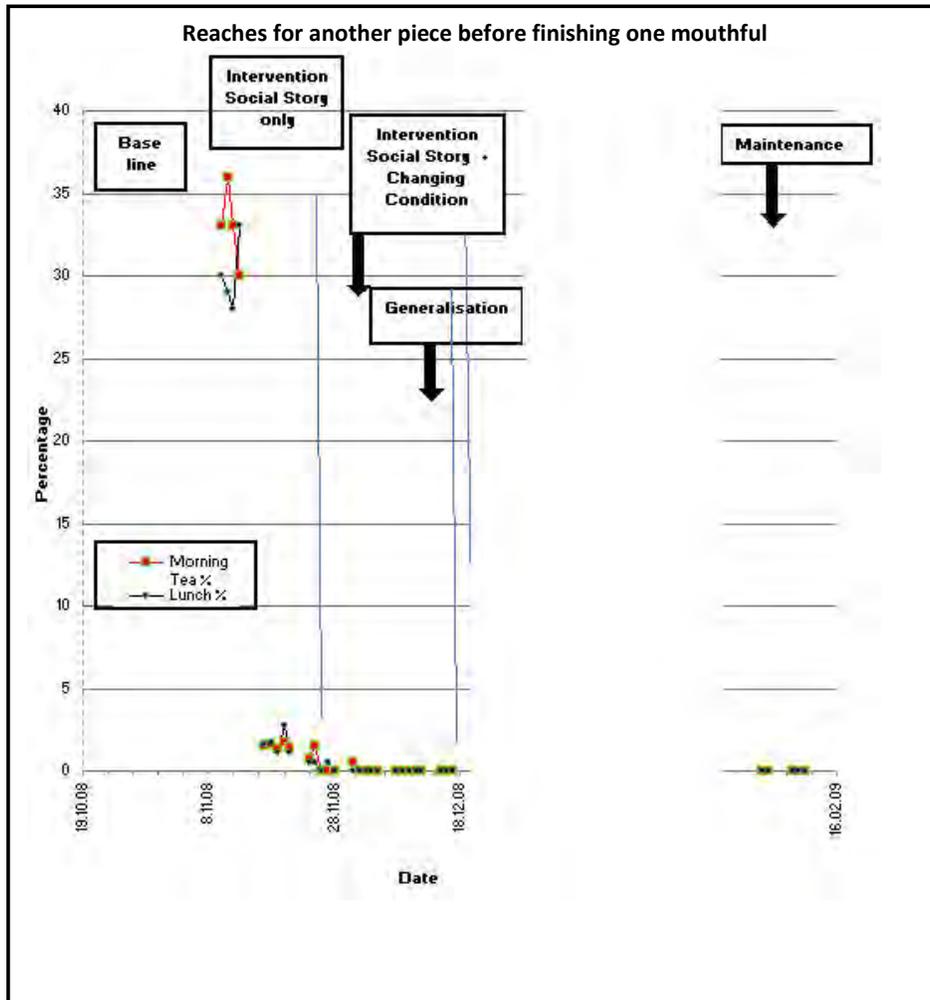


Figure 1. Reaches for another piece before finishing one mouthful

Figure 1 shows that baseline data was collected over four days. During these four days Jan reached for another piece of food before she finished one mouthful between twenty seven to thirty six percent of the time.

After four days the data was stable enough to put the intervention in place. During the intervention phase the teacher aide read the Social Story to Jan

immediately before she went out for morning tea and lunch. The results during the intervention phase were surprising. Although it was supposed that her eating behaviour would improve gradually over time, the rapid and sudden change from the first day of the intervention was unexpected. The times when Jan reached out for another piece of food before finishing one mouthful decreased to between one and three percent.

The study conducted by Bledsoe, et.al. (2003), investigating the use of a Social Story as the sole intervention to improve the mealtime skills of an adolescent with Asperger syndrome, also showed significant changes within the first week after the intervention was put in place. Bledsoe, et.al. referred to the observations of Gray and Garand in 1993 and stated "...when Social Story interventions are effective the results are typically apparent within the first week" (p.293).

The rapid change in Jan's behaviour needed further investigation. There were a number of possible reasons: The teacher aide suggested that the influence of her peers played an important role to bring about this change. When the photos for the Social Story were taken on day four of the baseline, the peers asked questions and were told that the photos were taken to develop a story for Jan to help her with her eating. They were alerted that some intervention was going to be put in place.

Another possible reason for the sudden change may be that when the Social Story was put up on the wall above Jan's desk, the peers showed a great interest in it and the teacher aide observed that they talked a lot about it; both to Jan and among themselves. These conversations were quite positive and they committed themselves to assure that the intervention was going "to work". The teacher aide expressed the view that the expectations that the peers had, that Jan's way of eating was going to become more acceptable, played a very important role. It seems that this positive peer pressure to

expect Jan to eat in a socially acceptable way was an additional motivation for Jan to comply.

A third possible reason for this sudden change was clearly the powerful message that the first photo in the Social Story carried: 'One bite at a time'. Whenever Jan saw me at school, she indicated 'one bite at a time' by showing 'one' with the index finger of her right hand. As the intervention developed, it seemed as if this simple gesture summarised the whole message to eat safely. After the maintenance phase, this is still the gesture that she makes when going out for morning tea or lunch, or when she sees me at school.

The intervention lasted for fourteen days and then the changing condition was introduced. Although the Social Story as the sole intervention seemed to be successful as Jan had a zero score for three consecutive days, I decided to put the changing condition into place. The reason for this was that the school year was fast running out. Should Jan not reached a score of zero for five consecutive days there would not be enough time to introduce the changing conditions design.

After introducing the changing condition, the results stayed down and showed a zero for five consecutive days, indicating that the target behaviour was reached. With only five days of the school year left, the next step was to determine whether the new eating habit would generalise and transfer when another teacher aide was introduced.

The second teacher aide, with whom Jan has worked before in class, was introduced during morning tea and lunch times for the last four days of the school year. She read the Social Story to Jan just before morning tea and lunch. Being with the second teacher aide did not alter Jan's eating behaviour and she continued for the following four days to eat at a level of zero.

It was difficult to determine whether the new behaviour was generalised and would maintain over the holidays. I was not able to observe Jan over the holidays at her home. I asked Jan’s mother about her eating over the holidays and from what the mother said it seemed as if Jan maintained her behaviour over the holidays.

After the holidays, Jan was observed for the first five days of the new school year. She maintained her socially acceptable and safe way of eating over the holiday period and did not reach out for another piece of food before swallowing.

Unstructured Interviews

	Eating cleaner (not spilling food over self/others; less mess)	Doesn't make me feel sick anymore	Doesn't vomit or make funny noises	Adults don't watch over us all the time
Student 1	✓			
Student 2	✓		✓	
Student 3		✓		
Student 4	✓	✓		
Student 5			✓	
Student 6		✓	✓	
Student 7				✓

Figure 2. Peer responses

As seen in figure 2, all seven students interviewed indicated that Jan’s way of eating was socially more acceptable after the intervention phase. They were all asked the following question: “Last term it seemed that Jan was

sitting alone when she was eating. Why are more students sitting with her this term when she is eating? The following answers were given: She is now eating cleaner; she is not spilling food over herself or others; she makes less of a mess; she doesn't make me feel sick anymore; she doesn't vomit or make funny noises anymore; adults don't watch over us all the time.

Conclusion

In this present study an ABC single subject design was used to teach an eight-year-old ASD a socially appropriate way of eating. Data showed that the Social Story was successful in changing the eating behaviour.

The main limitation of this study was the introduction of a changing condition. The possibility remains that the Social Story as the sole intervention could have been successful in changing the way of eating. The reason given for not persevering with the Social Story to reach five consecutive days of zero with the Social Story as the sole intervention, running out of time, is indicative of the fact that the study was performed by an inexperienced student.

A strength of the study was the inclusion of generalisation (across persons as well as the attempt to generalise over environments) and maintenance.

Further research on the efficacy of a Social Story as the sole intervention would widen the research base in this field.

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Appendix A

**Using a Social Story to teach an eight-year-old girl with
Autism a socially appropriate way of eating: A case study**

Information for Parents

Dear Parents

My name is Carina Voges. I am a student at the University Of Canterbury College of Education where I am studying towards a MTchLn.

As part of my study I am required to do a research project. Due to my interest in autism I have decided to investigate using a social story to teach a socially more appropriate eating behaviour. I would like to ask you to consider your daughter XXX to take part in this research project as the purpose of this project would be to teach her a safer way of eating, which may lead to reduced adult supervision during morning tea and lunch times. The implementation will be done by her teacher aide and will not compromise any of the safety measures currently in place. A proposal of this study was approved by both the academic and ethical research committees of the University Of Canterbury College Of Education.

Your child's anonymity is protected by using a pseudonym and all identifiable details from her school will be disguised. Participation in the study is voluntary and you have the right to withdraw her at any stage without any consequences. Collected data will be confidential and stored in the locked filing cabinet in my office and only I will have access to this data. The data will be destroyed after five years. The results of this study may be submitted for publication in an academic journal or be used in a conference but the anonymity of your daughter and her school is still guaranteed.

To start the project, baseline data will be collected. This means that your daughter will be observed for 3 days during morning tea time and lunchtime to record how many times she reaches for another piece of food before finishing her mouthful and how many times she finishes her mouthful before reaching for another piece of food. After I have collected this information, I will move to the next phase where the teacher aide will read the Social Story to your daughter immediately prior to morning tea time and lunch. It will also be displayed on the wall above her desk. This phase of the project will take around ten days. If the Social Story works well to teach her to take one mouthful at a time and finish it before she takes the next, we have achieved in what we set out to teach your daughter. If the Social Story alone does not lead to achieve our goal, verbal prompting would be introduced to use with the Social Story.

After achieving our goal for ten days we will start fading the Social Story. The Social Story will then be read once a day for five days. Should she after five days still eat without over filling her mouth, the Social Story will be read every second day for another five days after which it will not be read to her anymore. The story will still be displayed on the wall above her desk.

If you agree for your child to take part in the research, please sign the consent form (Appendix B). If you have any questions about this project you can talk to me or contact my supervisor, Dianne Walker at the University Of Canterbury College of Education. If you have any complaints you may also contact the Chair of the University of Canterbury Ethics Committee; see contact details below.

Thank you for considering taking part in my research project.

Signed: _____

Date: _____

Carina Voges
17 Kinver Place
Spreydon
Christchurch
Phone: 331 6391

Appendix B

Research Project to teach XXXX a socially appropriate way of eating

Parent Consent Form

Declaration of Consent

I give permission for my daughter _____ to participate in the research project, *Using a Social Story to teach an eight-year-old Girl with Autism Socially Appropriate Eating Behaviour*.

I have read and understood the information provided to me concerning the research project and what will be required of my daughter. I understand the procedures that will take place.

I am satisfied with what has been explained to my daughter regarding her involvement in the project.

I understand that the data collected through the observations will be treated as confidential and that no findings that could identify either my daughter or her school will be published. I am satisfied that the collected data will be confidential and stored in the locked filing cabinet in the student-researcher's office and that only the student researcher will have access to this data. I am aware that the data will be destroyed after five years.

I give permission that the results of this study may be submitted for publication in an academic journal or be used in a conference only if the anonymity of my daughter and her school is still guaranteed.

I understand that participation in the project is voluntary and that I may choose to withdraw my daughter from the project at any time without any consequences.

Parents:

Signature: _____

Date: _____

Researcher:

Name: Carina Voges

Signature: _____

Date: _____

Tel. 331 6391

Appendix C

Using a Social Story to teach an eight-year-old girl with Autism a socially appropriate way of eating: A case study

Information for Board of Trustees

Dear Trustees

You are aware of the fact that I am enrolled as a student at the University Of Canterbury College of Education where I am studying towards a MTchLn.

As part of my study I am required to do a research project. Due to my interest in autism I have decided to investigate using a social story to teach a socially more appropriate eating behaviour. I would like to ask you to consider your student XXX to take part in this research project as the purpose of this project would be to teach her a safer way of eating, which may lead to reduced adult supervision during morning tea and lunch times. The intervention will be undertaken by her current teacher aide and would not compromise any of the safety measures currently in place. A proposal of this study was approved by both the academic and ethical research committees of the University of Canterbury College of Education.

XXXX and the school's anonymity is protected by using a pseudonym and all identifiable details from her school will be disguised. Collected data will be confidential and stored in the locked filing cabinet in my office and only I will have access to this data. The data will be destroyed after five years. The results of this study may be submitted for publication in an academic journal or be used in a conference but the anonymity of the student and the school is still guaranteed.

To start the project, baseline data will be collected. This means that XXX will be observed for 3 days during morning tea time and lunchtime to record how many times she reaches for another piece of food before finishing her mouthful and how many times she finishes her mouthful before reaching for another piece of food. After I have collected this information, I will move to the next phase where the teacher aide will read the Social Story to XXX immediately prior to morning tea time and lunch. It will also be displayed on the wall above her desk. This phase of the project will take around ten days. If the Social Story works well to make well to teach her to take one mouthful at a time and finish it before she takes the next, we have achieved in what we set out to teach your daughter. If the Social Story alone does not lead to achieve our goal, verbal prompting would be introduced to use with the Social Story.

Fading the Social Story will be introduced after a successful intervention phase of ten days where the Social Story will be read once a day for five days. Should the behaviour still be appropriate,

the Social Story will be read every second day for another five days after which it will not be read to XXX anymore. The story will still be displayed on the wall above her desk.

If you agree for me to let this research study take part at your school, please sign the consent form (Appendix F). If you have any questions about this project you can talk to me or contact my supervisor, Dianne Walker at the University Of Canterbury College of Education. If you have any complaints you may also contact the Chair of the University of Canterbury Ethics Committee; see contact details below.

Thank you for considering my request.

Signed: _____

Date: _____

Carina Voges
17 Kinver Place
Spreydon
Christchurch
Phone: 331 6391

Appendix D

**Research Project to teach XXXX a socially appropriate way
of eating**

Board of Trustees Consent Form

Declaration of Consent

We give permission for _____ (name of student) to participate in the research project, *Using a Social Story to teach an eight-year-old Girl with Autism Socially Appropriate Eating Behaviour*.

We have read and understood the information provided to us concerning the research project and what will be required of XXX. We understand the procedures that will take place.

We understand that the data collected through the observations will be treated as confidential and that no findings that could identify either XXX or her school will be published. We are satisfied that the collected data will be confidential and stored in the locked filing cabinet in the student-researcher's office and that only the student researcher and her supervisor will have access to this data. We are aware that the data will be destroyed after five years. We give permission that the results of this study may be submitted for publication in an academic journal or be used in a conference only if the anonymity of the student and her school is still guaranteed.

CEO: Board of Trustees

Name:

Signature: _____

Date: _____

Researcher:

Name: Carina Voges

Signature: _____

Date: _____

Tel. 331 6391

Appendix E

Frequency Recording Form

Date	Morning Tea		Lunch		Total
	Reaches for another piece <i>before</i> finishing mouthful	Reaches for another Piece <i>after</i> finishing mouthful	Reaches for another piece <i>before</i> finishing mouthful	Reaches for another piece <i>after</i> finishing mouthful	
Monday, _____					
Tuesday, _____					
Wednesday, _____					
Thursday, _____					
Friday, _____					

For the project

Using a Social Story to teach an eight-year-old girl with Autism a socially appropriate way of eating: A case study

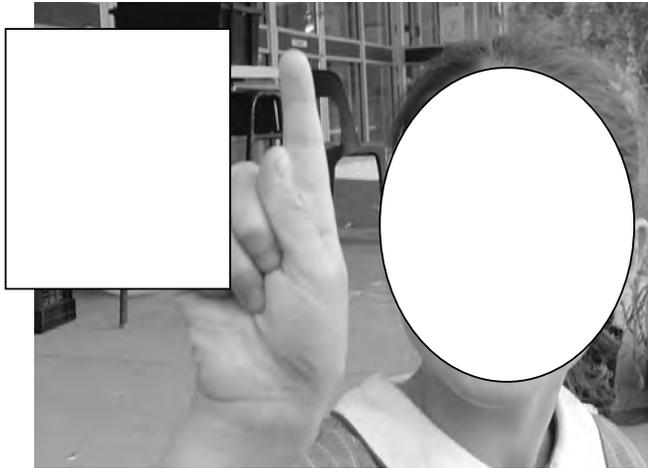
Behaviour Definition:

The eating behaviours that will be targeted for the Social Story intervention is to record how many times Jan reaches for another piece of food before finishing her mouthful and how many times Jan finishes her mouthful before reaching for another piece of food.

Appendix F: Social Story

Why is it good for me
to take one bite?

I am learning to take one
bite at a time.



I am taking one bite at a time so I eat safely.



My friends like it when I take small bites.



It is good to chew one
small bite at a time.



When I eat I will try to
take small bites and
swallow so my mouth is
empty before I take the
next bite.



Appendix G**Social Story Checklist**

1. The story meaningfully shares social information with an overall patient and reassuring quality. (If this is a story teaching a new concept or skill, another is developed to praise a child's positive qualities, behaviours, or achievements.)
2. The story has an introduction that clearly identifies the topic, a body that adds detail, and a conclusion that reinforces and summarises the information.
3. The story provides answers to "wh" questions, describing the setting or context (where), time-related information (when), relevant people (who), important cues (what), basic activities, behaviours, or statements (how), and the reasons or rationale behind them (why).
4. The story is written from a first person perspective, as though the child is describing the event.
5. The story uses positive language, omitting descriptions or references to challenging behaviours in favour of identifying positive responses.
6. The story is comprised of descriptive sentences (objective, often observable, statements of fact), with an option of anyone or more of the following sentence types:
 Perspective sentences (that describe the thoughts, feelings, and/or beliefs of other people); cooperative sentences (to explain what others will do in support of the child); directive sentences (that identify suggested responses or choices of responses to a given situation); affirmative sentences (that enhance the meaning of surrounding statements); and/or control sentences (developed by the child to help him/her recall and apply information in the story).
7. The story follows the Social Story Formula:

$$\frac{\text{DESCRIBE (descriptive+perspective+cooperative+affirmative)}}{\text{*DIRECT (directive+control)}} \geq 2$$

*If there are no directive and/or control sentences, use 1 instead of 0 as the denominator.
8. The story matches the ability and interests of the audience and is literally accurate.

9. If appropriate, the story uses carefully selected illustrations that are meaningful for the child and enhance the meaning of the text.
10. The title of the story meets all applicable Social Story criteria.

Appendix H

Unstructured Interview

Last term it seems that Jan was sitting alone when she was eating. Why are more students sitting with her this term when she is eating?