The Effect of Static versus Animated Story Stimuli on Children's Ability to tell Stories

Sarah Anderson, Michaela DeBeyer, Alissa Marcinkow,

Sarah Scheffers, Tamaira Servant, Kristin Willerton

Supervisor: Phyllis Schneider Reader: Denyse Hayward

Static versus Animated Story Stimuli

ABSTRACT

Storytelling tasks are commonly used to assess language in a functional context. However, the quality of children's stories can vary depending on how stories are elicited. Research (Pearce, 2003; Schneider & Dubé, 2005) has shown differences in children's narratives when retelling stories from oral and picture stimuli. We examined an additional type of story elicitation method: animated stimuli.

The purpose of our study was to determine whether 4- and 5-year-old children provide more story grammar information with an animated version of the story than with a static version. Each child told a story from animated and static stimuli. The stories were then scored for amount of story grammar information and scores were compared from the two conditions.

The results from the study demonstrated that the number of story grammar units included in children's narratives when presented with an animated stimulus did not differ from the number of SG units included when presented with a static stimulus. Therefore, when choosing presentation formats of narratives for teaching, assessment, and treatment purposes for this age group, a static presentation of a narrative appears to be just as effective as an animated presentation.

INTRODUCTION

The capacity to tell stories effectively is an important part of daily life. We tell stories throughout the day in many different contexts, such as work, school and interaction with family, friends, and peers (Schneider, Hayward, & Dubé, 2006). Storytelling is a useful clinical tool that speech-language pathologists (SLPs) can use to assess developing language skills in children, since it requires a number of tasks including formulation of words into sentences and the joining of these sentences together into a coherent whole (Schneider, Hayward, & Dubé, 2006). The use of storytelling as a form of assessment has been recommended in the literature. Storytelling is arguably a better test of a child's actual language abilities than other tests, such as single-word production or imitation, since it is more spontaneous and similar to language that would be used to communicate with others (Schneider, 1996). Children's skills in storytelling can also be used to accurately determine their language abilities as well as whether or not they have a language disability (Schneider & Dubé, 2005).

Children's ability to tell and understand stories also seems to be predictive of other skills, such as reading comprehension (Goldstein, Harris, & Klein, 1993). As well, stories have often been found to be more similar to written language than are conversations, in terms of elements such as mean length of utterance as well as the complexity of the syntax, among others (Schneider, Hayward, & Dubé, 2006). A child's ability to tell stories can therefore be a predictor of later literacy skills. Because storytelling is such a useful clinical tool, determining which types of stimuli are most easily understood by children and how this affects the stories they tell is then an important goal.

Several types of stimuli have been used in studies of children's narrative production including retelling of oral stories (Merritt & Liles, 1987; Schneider, Williams, & Hickmann, 1997), static pictures (Girolametto, Wiigs, Smyth, Weitzman, & Pearce, 2001), combined oral stories and pictures (Paul, Hernandez, Taylor, & Johnson, 1996; Schneider, Hayward, & Dubé, 2006; Schneider & Dubé, 2005), video (Dollaghan, Campbell, & Tomlin, 1990; Rice & Roudebush, 1989), and favourite stories from memory (Morris-Friehe & Sanger, 1992). The results of these studies have varied depending on the story presentation formats. For example, in certain studies wherein different formats of story presentation were compared, specifically those done by Schneider (1996) as well as Schneider and Dubé (2005), the authors found that children told more complete stories when the story was presented to them orally, or orally with pictures, and they told less complete stories when the story was presented in the form of pictures only.

Although widely used, static picture stories may be more difficult for children to understand than other types of stimuli. In a study by Schneider (1996), children aged 5;7 to 9;9 with language impairments, telling stories based on static stimuli alone tended to leave out basic, central story information. It is possible that this is not because they have less developed story skills, but instead that they are not able to interpret static pictures as well as older children could. Rice and Roudebush's (1989) research showed that video presentations elicited more language and a greater variety of specific language structures from 5-year-old children than did a series of pictures. However, they did not compare amount of story information that children included in the two conditions.

Because an animated story represents action more explicitly, it might be expected that 4- and 5-year-old children's narratives would be of a higher quality than stories based on static

stimuli. There is limited information about the effects of animated versus static picture stimuli on the narrative production of children aged 4 to 5. In our study, we used animated and static picture versions of the same story to determine if 4- and 5-year old children's narratives differ based on the story stimuli presented to them. We selected this age group because they typically do not yet include all Story Grammar (SG) units in their stories, and therefore the amount of SG units that they include might differ depending on the stimuli that they are presented with.

The Story Grammar model, which focuses on the overall content and organization of stories, was used as a framework to evaluate story quality in the present study. Researchers have previously applied this model to compare stories told by children (Merritt & Liles, 1987; Ripich & Griffith, 1988). The SG model describes structural patterns of stories, with a 'complete episode' being the most basic structural pattern that can still be considered acceptable by the model (Schneider, Hayward, & Dubé, 2006). Within these episodes, stories are then coded for the information that they contain using SG units. SG units are basic, central information elements that a story must contain in order to be considered a "good" story (Stein & Policastro, 1984). Three SG units are considered to be core, or essential, units. These units are: Initiating Event, Attempt, and Outcome (see Table 1 below for descriptions). This model also includes at least one central character that sets out to achieve a goal (Schneider, Hayward, & Dubé, 2006). SG scoring is used to determine whether a child is telling a story that contains the elements that must be included in the story for it to be considered adequate and to be understandable to the listener.

Table 1. Story Grammar Units

Setting	Characters in the story Location, activity, and/or habitual state or characteristic ('he was always hungry'; 'she liked to read')
Initiating Event	Event that sets off the story's events and will cause the protagonist to respond in some way or evokes an immediate response
Internal Response	Reaction of protagonist to the initiating event. It can be expressed in dialogue, e.g., “oh no!” expresses an internal response
Internal Plan	Internal plan of protagonist to deal with the Initiating Event
Attempt	Attempt to obtain the goal
Outcome	Consequence of the attempt
Reaction	How the character(s) feel or think about the outcome, or how they react physically (e.g., run away)

Reproduced from Schneider, Hayward, & Dubé, 2006, p. 226.

In our study, we assessed animated versus static story stimuli in children's narratives to see if children provide more information with the animated version of the story. Our research question was: “Will 4-and 5-year old children tell more complete stories (in terms of SG units) when presented with animated picture stimuli versus static picture stimuli?” We predicted that the children in our study would provide more SG units when presented with the animated story stimuli. Since we presented the same story in two different forms, animated and static, we were able to compare the stories told by the children in the two different conditions. Analyzing the stories with SG units provided insight into how children typically structure stories and which SG units they tend to include in their narratives. Specifically, we will determine whether the quality of children's stories (in terms of SG units) is influenced by the nature of stimuli used to elicit the story. By presenting stories to children in different formats and then assessing their

storytelling ability in each situation, we expected to determine which contexts would elicit more SG units from the children and which context would elicit fewer SG elements. The implications of this study are important for clinicians, researchers, and educators who present stories to children in a variety of formats. Narratives are used extensively in assessment, education and therapy; thus it is important to know if, and to what extent, the various presentation formats affect children's comprehension and performance.

METHODS

Participants

Consent forms and information letters were distributed to the parents of eligible children at participating childcare facilities. Testing was attempted with all children whose parents returned the consent forms. Although the parents of 30 children signed parental consent forms, only 21 of these children participated; seven children declined to complete the task. All participants who completed the tasks were native English speakers and between the ages of 4 and 5 years old at the time of testing. The mean age of the children who participated was 57.32 months (SD = 4.54, range 49-66). There were 9 boys and 12 girls. Socioeconomic status of the participants was assessed by the level of maternal education; the mean in years was 16.90 (SD = 3.46, range = 12-24). All data for this study was collected at the child's daycare, preschool, or kindergarten facility, following oral assent from the child.

Materials and Procedure

The picture stimuli material used was taken, with permission, from the Edmonton Narrative Norms Instrument (ENNI) Story A1 (Schneider, Dubé, & Hayward, 2005). The ENNI is

an assessment tool designed to test the expressive language abilities of children aged 4 to 9 through storytelling tasks. It also contains a Story Grammar Scoring Sheet for Story A1, with a maximum score of 13 points. Each child looks at a set of pictures that are designed to tell a story and then they formulate a story and tell it to the examiner. Pictures in the ENNI were drawn by a professional cartoonist. Scoring guidelines from the ENNI were also used.

An animated version of story A1 was made by students in the New Media program at the University of Alberta for course credit. The program was made using Shockwave Flash Player. Pictures for story A1 were scanned and coloured. Animations of key elements of the pictures were made as follows: Picture 1, the ball bounces and goes into the pool; Picture 2, there is a close-up of the elephant looking upset; Picture 3, the giraffe is swimming toward the ball; Picture 4, the giraffe gives the ball to the elephant; Picture 5, water is dripping off the giraffe. The animated version is moved from one picture to another by a button on each page.

To make the two conditions as similar as possible, the static pictures for story A1 were coloured to match the animated version. The pictures for the static story were scanned and displayed on a laptop using Microsoft PowerPoint.

The stories were collected and audio-recorded by a team of six student SLPs, working in pairs; one student acted as the facilitator and the other as a naïve listener. Participants were presented with one of two training stories, followed by a test story (static or animated). Both of the training stories were in static form. Two weeks later, each participant was presented with the other training story and the other test story (static or animated). The order of story administration was counterbalanced; half of the participants were presented with the static picture stimuli first and half were presented with the animated picture stimuli first. This was

done to control for the possibility that performance on the second administration of story stimuli was influenced by the first administration.

Each child was instructed to first look at the pictures; once they had seen all the pictures, the facilitator went back to the beginning of the story and the child told the story to the listener. The facilitator explained that, since the listener was not able to see the pictures, the child needed to "tell the story really well so [the listener] can understand it". The concept of the naïve listener was introduced into the task so that simply pointing to the pictures was not a legitimate option for communication in this context. During the presentation of the training story, the facilitator was allowed to provide a limited number of prescribed guiding prompts and questions to encourage the child to include more details in their story (e.g., "How would you start your story? Once upon a time..."; "You've told me what's in the picture - now can you tell me a story about the picture?"). Upon completion of the training story, the facilitator repeated the instructions and showed the test story picture stimuli. During the presentation of the test story, the facilitator was not allowed to prompt for more information or help in any other way, but general encouragement was allowed.

The audio recordings were transcribed by the examiners who administered the test stories. Six of the 21 recordings were then re-transcribed by a different examiner and compared to the original examiner's transcription to ensure inter-rater reliability. Word-by-word reliability for the transcribed stories was 93.25%. The transcribed stories were then coded and scored for SG units again by the examiners who had administered the test stories, using the ENNI A1 Story Grammar Scoring Sheet. Again, six of the 21 transcripts were coded and scored a second time

by a different examiner, and the SG score sheets were compared to the originals to ensure inter-rater reliability. Point-to-point scoring reliability for the transcripts was 94.17%.

Study Design

Our study used a within-subject design. The dependent variable was the number of SG units produced in each storytelling task. The independent variable was story stimuli: animated or static.

RESULTS

Since the same children were tested in each condition, it was important to rule out the effects of presentation order. Preliminary independent t-tests were conducted to compare the static SG scores of children who received the static story first to those who received it second, as well as to compare the animated SG scores of children who received the animated story first to those who received it second. The mean and standard deviation of SG scores for children who received the static story first were 6.80 and 2.394 respectively. The mean and standard deviation of SG scores for children who received the static story second were 6.91 and 3.807 respectively. There was no significant difference in static SG scores as a result of receiving the static story first, $t(19)=-.078$, $p=.939$. The mean and standard deviation of SG scores for children who received the animated story first were 6.60 and 3.748 respectively. The mean and standard deviation of SG scores for children who received the animated story second were 7.09 and 3.419 respectively. The independent t-test revealed no significant difference in animated SG scores as a result of presentation order, $t(19)=-.314$, $p=.757$.

To answer our research question, a paired samples t-test was used to compare the SG scores achieved in the static condition to the SG scores achieved in the animated condition. The mean and standard deviation of the static SG scores were 6.86 and 3.135 respectively. The mean and standard deviation of the animated SG scores were 6.86 and 3.497 respectively. Results of the paired sample t-test revealed no significant difference in SG scores achieved in the animated condition as compared to the static condition, $t(20)= .000$, $p=1.000$.

There was a positive correlation ($r=.541$, $p=.011$) between SG scores attained in the static condition and SG scores attained in the animated condition. This suggests that a child who scored higher (i.e., closer to the maximum score of 13) on SG when presented the static stimuli also scored higher when presented with the animated stimuli, and conversely, that a child who scored lower (i.e., closer to the minimum score of 0) in one condition also scored lower in the other condition. However, 18 of the 21 children achieved scores that differed from one condition to the other. Nine of these children had scores that only differed by one point. One child's scores differed by as much as eight points, which was the largest difference.

In summary, the number of SG units included in children's narratives when presented with an animated stimulus did not differ from the number of SG units included when presented with a static stimulus. The order in which the story stimuli were presented was not found to affect the children's performance on the task.

DISCUSSION

Our study provided further information on how children's narrative abilities are affected by story presentation (Schneider & Dubé, 2005). Stories can be presented orally, pictorially or,

in the case of this study, in animated form. Schneider and Dubé (2005) found that children provided more story elements when retelling a story presented orally than when presented with static pictures. The researchers suggested continued exploration of the effects of stimuli presentation on storytelling of children, such as animation. Our study followed this suggestion and investigated story retelling abilities of 4- and 5-year-old children when presented with static and animated stimuli. Considering the fundamental characteristics of each type of stimuli, it was anticipated that the children would formulate a story from the animated version with more SG units than the static version. Our hypothesis was based on the premise that the animated story version would highlight features of the story that the static version did not.

In opposition to the proposed hypothesis, our study results indicated that there was no significant difference in the number of SG units produced by 4- and 5-year-old children when presented with the two different story stimuli. This suggests that one presentation condition is not superior to the other for optimizing 4- and 5-year-old children's narrative performance. Taken as a whole, the animated version, with its salient features, did not influence the quality of the children's stories as predicted.

Although the results indicated no difference between the two story stimuli, it is important to consider that there was individual variation within the cohort. Some of the children produced more SG units when presented with the animated version and some with the static version. This might suggest that individual children may have preferences for particular story presentations because they could more easily understand that version and its presentation. However, children did not all prefer the same stimulus type, and thus one type of story stimuli did not elicit superior stories than the other.

Sample size and its effect on the data were considered. The means from the two groups were similar; therefore, our effect size is close to zero. Thus, increasing the sample size and power would not have shown significant results. Also, even though the mean difference was near zero, some children demonstrated large differences between the two conditions such that some children performed better with the animated story and others with the static story. A larger sample size (increase in power) would not have made a difference in the results if this pattern remained the same.

When considering the methodological approaches of our study, the testing situation may have been unnatural for some participants. Many of the participants had not yet been exposed to a school setting, where they are often required to do tasks similar to the ones in our study. This, in turn, may have hindered the participants' optimal performance in story retelling. When making generalizations based on the results, it is important to consider the age of the cohort. Only one age group of children were included in this study, which restricts the possibility of generalizing the results to other age groups. We selected this age group because children at this age are not yet telling complete stories in terms of SG, and thus it seemed likely that the difference in conditions might have an effect on their stories. Further research might repeat the same study with an older or younger population. Additionally asking children within this age range to tell longer, more complex stories may reveal a difference that telling a simple story did not. Salient SG elements, when animated, may provide a memory aide that was not needed when telling a simple short story.

CONCLUSION

Narratives are used in education, therapy and assessment; thus, the implications of this study are important for professionals such as SLPs, teachers or parents. These individuals often play an integral role in presenting stories to children. Our study considered a static and an animated presentation of the same story to 4- and 5-year-old children, and revealed no significant difference in the quality of stories elicited based on type of stimuli used. When choosing presentation formats of narratives for teaching, assessment, and treatment purposes, a static presentation of a narrative is just as effective as an animated presentation, at least when using the ENNI story with children aged 4-5. Presently, more research to further explore animated story stimuli effects on children's stories (quantity and quality) for other age groups and for more complex stories would provide more insight into its usefulness.

REFERENCES

Dollaghan, C.A., Campbell, T.F., and Tomlin, R. (1990). Video narration as a language sampling context. *Journal of Speech and Hearing Disorders*, *55*, 582- 590.

Girolametto, L., Wiigs, M., Smyth, R., Weitzman, E., & Pearce, P.S. (2001). Children with a history of expressive vocabulary delay: Outcomes at 5 years of age. *American Journal of Speech-Language Pathology*, *10*, 358-369.

Goldstein, B.C., Harris, K.C. & Klein, M.D. (1993). Assessment of oral storytelling abilities of Latino Junior High School students with learning handicaps. *Journal of Learning Disabilities*, *26*(2), 138-143.

Merritt, D.D., & Liles, B.Z. (1987). Story grammar ability in children with and without language disorder: Story generation, story retelling, and story comprehension. *Journal of Speech and Hearing Research*, *30*, 539-552.

Morris-Friehe, M. J., & Sanger, D.D. (1992). Language samples using threes story elicitation tasks and maturation effects. *Journal of Communication Disorder*s, 25, 107-124.

Paul, R., Hernandez, R., Taylor, L., & Johnson, K. (1996). Narrative development in late talkers: Early school age. *Journal of Speech and Hearing Research*, *39*, 1295-1303.

Pearce, W.M. (2003). Does the choice of stimulus affect the complexity of children's oral narratives? *Advances in Speech-Language Pathology*, *5*(2), 95-103.

Rice, M.L., & Roudebush, C.R. (1989, November). Language sampling procedures: Sequenced pictures versus video. Paper presented at Annual Convention of the American Speech-Language-Hearing Association, St. Louis, MO.

Ripich, D.N., & Griffith, P.L. (1988). Narrative abilities of children with learning disabilities and nondisabled children: Story structure, cohesion, and propositions. *Journal of Learning Disabilities*, *21*, 165-173.

Schneider, P. (1996). Effects of pictures versus orally presented stories on story retellings by children with language impairment. *American Journal of Speech-Language Pathology*, *5*, 86-96.

Schneider, P. & Dubé, R.V. (2005). Story presentation effects on children's retell content. *American Journal of Speech-Language Pathology, 14*, 52-60.

Schneider, P., Dubé, R.V., & Hayward, D. (2005). The Edmonton Narrative Norms Instrument. Retrieved [September 15, 2011] from University of Alberta Faculty of Rehabilitation Medicine website: http://www.rehabmed.ualberta.ca/spa/enni.

Schneider, P., Hayward, D., & Dubé, R. (2006). Storyretelling from pictures using the Edmonton Narrative Norms Instrument. *Journal of Speech-Pathology and Audiology, 30*(4), 224-238.

Schneider, P., Williams, B., & Hickmann, M. (1997). The awareness of referential cohesion in children with and without language/learning disabilities. *Journal of Speech-Language Pathology and Audiology*, *21*, 8-16.

Stein, N. L., & Policastro, M. (1984). The concept of a story: A comparison between children's and teachers' viewpoints. In H. Mandl, N. L. Stein, & T. Trabasso (Eds.), *Learning and the comprehension of text (pp. 113–155)*. Hillsdale, NJ: Erlbaum.