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# POETRY AS A MNEMONIC PROMPT IN CHILDREN'S STORIES

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*This research investigates the effects of prosody on children's recall for stories using two successive studies. Study 1 is an ethnographic exploration of a group of fifth graders creating summaries of a children's story with overt prosodic elements. Study 2 is a quasi-experiment in which the story summaries created by students who heard one of two versions (more or less prosodic) of the story from Study 1 were compared. Overall, we find that the amount of prosody in a story has a significant effect on children's story recall and the quality of the stories they produce.*

Previous research has focused on the goal structure of stories. Stories written for children typically conform to an episodic story structure that is organized around some problematic event or change in the state of the story world that motivates a reaction on the part of the story characters. This reaction contains both internal responses, such as feelings, intentions, and goals, as well as actions that address the internal responses (Mandler & Johnson, 1977; Rumelhart, 1975; Stein & Glenn, 1979; Trabasso & Van den Broek, 1985). Depending on the outcomes of various actions, new internal responses, especially goals, may be generated. Events and states in stories can be related to one another causally, temporally, or spatially.

In contrast to the extensive work on the goal structure of stories, less attention has been paid to the language used to "tell the story." Yet "stories" for very young children often emphasize the

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lyrical or poetic properties of language (e.g., the works of Dr. Seuss); stories for older children (approximately age 8 and up) tend to be written more discursively.[1] Lyrical, poetic properties of "story" language include rhymes, repeated phrases, rhythmic patterns, and sound patterns such as alliteration or onomatopoeia (La Drière, 1993).[2] Some educators have pointed out the affective effects of poetic elements. For example, master storyteller and language arts specialist Gregory Denman claims that repeated phrases or lines emphasize a feeling or idea that the poet (writer) particularly wants the reader to be aware of. Refrains, a series of repeated lines and phrases, "have a chorusing effect that often draws the listener into the poem" (Denman, 1988, p. 28). In other words, poetic language produces affective involvement in the story world.

The appearance of highly lyrical language in stories for young children recapitulates the use of such language in the earliest oral narratives. For instance, the Homeric epics used very complex forms of rhythmic intonation, lexical repetition, and poetic meter. These devices had two functions from the storyteller's point of view, according to Homeric scholars (e.g., Bakker, 1997; Knox, 1990). They provided mnemonic cues to specific segments of the story and they afforded a certain amount of flexibility in the story construction. That is, Homer and other epic poets had a stock list of poetic refrains that could be used at various points in the narrative to take the story in new directions while still maintaining the poetic flow. The occurrence of these refrains coincides with transitions between episodes. Thus, the lyrical properties of language provided a scaffold for remembering the specific linguistic forms used to tell the story (e.g., words and patterns of phrasing) and for remembering various episodes. The combination would have made it possible for a storyteller to recreate the informational and affective force of the story time and again and to adapt it to the particular context.

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[1]We use the term "discursive" to refer to language that does not include overly lyrical and poetic characteristics.

[2]Not all fiction for very young children conforms to the episodic structure described above. Yet, children judge texts that more closely conform to that structure to be better stories than texts that do not, especially if goals are lacking (Stein & Policastro, 1984). Sometimes stories for young children that emphasize the poetic properties of language do not meet the criteria for an episodic structure, although they may describe a sequence of events and states. Hence, our use of quotes around the word stories.

From a cognitive perspective, how might poetic language function in stories written for children? One possibility is that rhythm heightens attention to the action of a poem or story (Denman, 1988). Another possibility is that it functions as a mnemonic aid, much as it did in Homeric times. Yet a third possibility is that repeated patterns create predictability that helps children understand that stories do, in fact, have structure and identify critical defining elements of that structure. The earliest structures in stories that children learn may be sound structures conveyed through repeated lyrical patterns, not unlike sound sequences observed in learning a first language. Research on language acquisition indicates that the babbling of infants reveals patterned repetition of speech sounds (Fernald et al., 1989). Furthermore, Schwanenflugel, Hamilton, Kuhn, Wisenbaker, and Stahl (2004) find a link between decoding skills and prosody. That is, as children develop their decoding skills in reading they also become better able to read prosodically. Other language development research suggests that prosodic features of language, such as stress and pause patterns, play an important role in comprehension (Kuhn & Stahl, 2003; Kintsch, 1998). For example, Shady and Gerken (1999) found that 2-year-olds used pause location to help them identify object nouns in simple sentences. Chen (1998) found that stress patterns in sentences cued younger children (5- and 7-year-olds) to the identification of given versus new information. Chen also found that when stress patterns and grammatical structure converged on the same information as given versus new, children's performance was better than when only one cue was present. By analogy to the role of prosodic lyrical properties in early language developments, lyrical features of stories may constitute a cueing system for identifying the episodic goal structure.

Indeed, there is evidence that the lyrical properties of language play a role in interpretation of meaning (Gee, 1986, 1991; Labov, 1966). Labov (1966) showed how rhythmic patterns of certain ethnic dialects had a critical impact on the interpretation of sentences. Gee (1986, 1991) elaborated and expanded Labov's observations about rhythmic patterns in language. He developed a system for hierarchically analyzing the rhythmic patterns in children's oral narratives. These "units" based on the lyrical qualities corresponded quite well to units defined by syntax and semantics

(e.g., clauses, sentences, paragraphs). Gee's work suggests the plausibility of considering lyrical properties of stories as potential cues to story interpretation.

A focus on the lyrical properties of the language of the story places renewed emphasis on the surface structure of the story and the processes by which comprehenders construct a representation of the episodic goal structure of the story. Zwaan and colleagues suggest that these processes include monitoring the story for information on five dimensions of events; the actor(s) or protagonist(s), intentions or goal structure, time, space, and cause (Zwaan, Langston, & Graesser, 1995; Zwaan, Magliano, & Graesser, 1995; Zwaan & Radvansky, 1998). Changes in any of these dimensions are cues to potential shifts in the episodic goal structure of the story and are important because of their representational consequences (cf. Gernsbacher, 1997). Changes in multiple dimensions at the same point in the story more strongly indicate a shift in the episodic goal structure.

Zwaan and Radvansky (1998) and Goldman and Rakestraw (2000) note that the surface structure of stories often contains linguistic cues that act as signals to changes in these five dimensions. For example, the phrase "The next day" is a linguistic signal in the story to a change in time. Adult comprehenders use these linguistic cues in monitoring changes in the dimensions of events (cf. Zwaan & Radvansky, 1998). Poetic and lyrical properties of the surface structure of the story also may play a role in cueing information on the various dimensions of events, especially for children.

In the work reported in this article, we examine the role that lyrical properties of the story play in cueing dimensions of events. Specifically, we look at the role that lyrical aspects of the story play in children's selection of story information included in reconstructions that they will later read to younger children. We asked 5th grade children to create for younger children (4- and 5-year-olds) a version of an episodically structured story. The language of the story featured many poetic elements. We placed a serious constraint on the length of the story so that the children were forced to shorten the original story that they heard. The issues of interest were (a) what dimensions of events children included in their reconstructed stories, and (b) the language they used to express the information. We examined these issues in two studies. Study 1

was an exploratory and largely qualitative analysis of these issues. Study 2 was a more formal, quasi-experiment. Both studies used the same story, an analysis of which we provide prior to describing each study.

### *Analysis of the Glowbird Story*

The story used in the present studies, "The Little Planet and The Glowbird" (Little Planet Literature Series, 1995), is a multi-media story designed to be used in primary grade classrooms. It is part of the Little Planet Literacy series, a video- and computer-based curriculum supplement designed to foster reading, writing, and the development of early scientific reasoning (Williams et al., 1998). The story used in the present studies was presented in its video version. The video version is narrated, has music, and is 15 minutes in length. The narration contains 3050 words. Students were not given the print version of the story. Figure 1 depicts the structure of the nine-episode story.

The story takes place on an imaginary planet inhabited by "animal" characters that are combinations of real animals that exist on earth (e.g., Glowbird is half bird, half butterfly; Owlybear is half owl, half bear). In brief, the story revolves around Glowbird's search for a new home after the other animals on her little planet inadvertently destroy hers. Over the course of a series of episodes she travels to a variety of habitats on her world (e.g., desert, mountain, etc.) looking for a place to live. Simultaneously, the animals who are responsible for the destruction of her home realize what they have done and decide to rebuild Glowbird's native habitat in an effort to get her to come back home. In her quest, Glowbird circumnavigates her planet and arrives back at her starting point, finds her home rebuilt, moves back in, and she and the animals live "happily ever after." Thus, all of the animals' learn the importance of ecological conservation of habitats. Science content is embedded in this story because it is designed to be the anchor of an instructional environment in which young children do research on habitats and ecology. (See Appendix A for a more detailed, episode-by-episode, synopsis of the story.)

The actual surface structure of the story is a combination of poetry and prose. The poetic structure includes a refrain that is repeated in seven of the nine episodes, a variety of repeated phrases

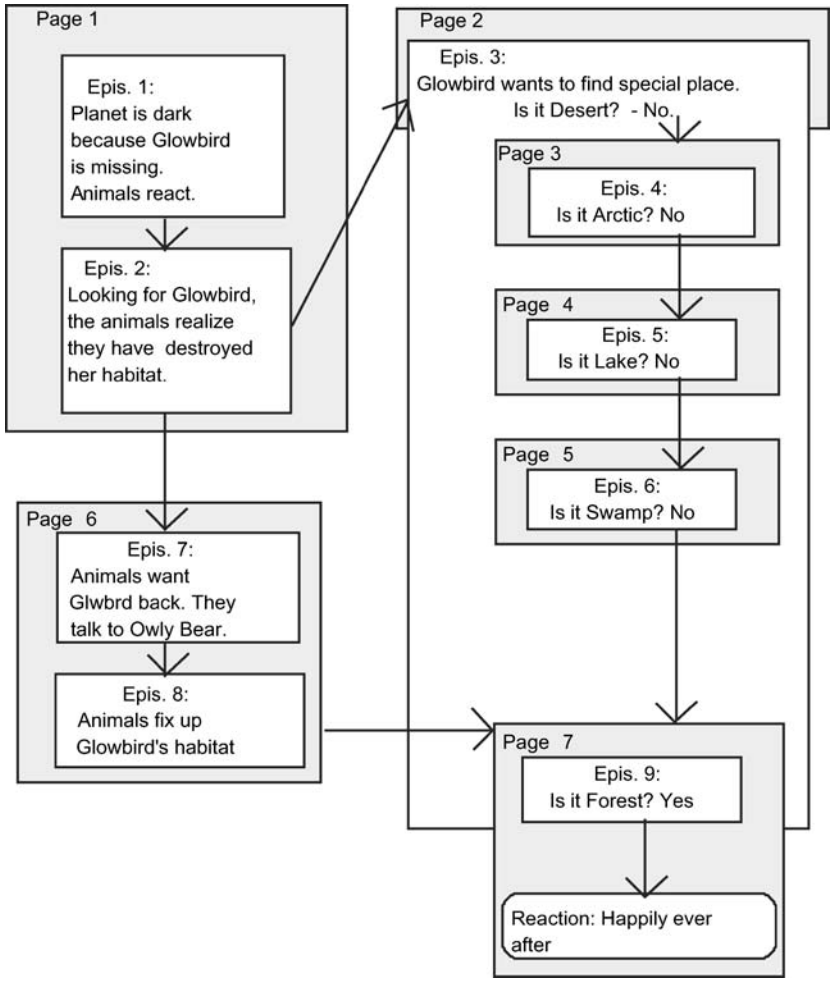


**FIGURE 1** Causal goal structure of "The Little Planet and the Glowbird." Page numbers correspond to the pictures/segments into which the story was divided for story reconstruction. Each picture covered the episodes enclosed in the page boxes.

that frequently rhyme, several repeated grammatical structures, and rhyme schemes within sentences as well as across pairs of sentences. The oral narration highlights the lyrical properties of the poetic structure through intonation, stress, breath patterns, and pitch. For example, each time Glowbird arrives at a new location,

there is a poetic refrain in which she repeats the chain of events that destroyed her habitat in the old forest:

They cut down my tree
and they took all my berries
and stopped my stream,
and said I was too small to play.
I had to leave.
I couldn't stay.
It wasn't a very good day.
Now I'm looking for a special place to call my own
and when I find that special place
I'll know inside it is my home.

In this refrain, the lyrical properties of the story are associated with several dimensions of events. For example, Glowbird's intention is encoded linguistically and is part of the rhyme scheme of the refrain (e.g., Now I'm looking for a special place to call my own). Likewise, the local causal relations leading to the destruction of Glowbird's habitat are present in this refrain. Other examples of poetic elements in the story include the repeated use of the phrase "flew and flew" each time Glowbird went from one location to the next, within-sentence rhyme schemes (e.g., "light the night"), and alliteration (e.g., "slip and slide" and "Glowbird's glow").

## Study 1

Study 1 was an exploratory examination of the role that lyrical aspects of language might play in children's reconstruction of a shorter form of the story. The study was conducted over several sessions of an after-school program run by the authors. The goal of the after-school program was to encourage children to engage in literacy practices that involved multiple texts and multiple forms of literacy. Work with the Glowbird story was designed to foster connections between video- and print-based literacy and a sense of audience. Students were asked to create a seven-page picture book version of the Glowbird video version of the story. With just seven pages, students could not directly transcribe all of the oral narration they had heard on the video. They had to relate the story they were creating to the original narration and make decisions

about what elements of the story to include. Students were told that the purpose of these books was to read them to younger 4- and 5-year-olds. Students worked on the books in dyads to encourage greater reflectivity and conversations about the story.

## Method

### *Participants*

Twelve 5th-grade students (10 and 11 years old) who were in an after-school club participated in this study. These students were selected from one 5th-grade classroom on the basis of observations we conducted of their achievement, interest in school work, and willingness to cooperate with one another. The selection for participation in the club was done prior to, and independently of, plans for the present study. The classroom is located in a lower SES, ethnically diverse middle school. The 12 students in the after-school club reflected the population of the school: there were four African Americans, one Pakistani, and seven European American participants. Four participants were female and 8 were male. Participants averaged 54th percentile nationally in terms of their reading achievement (range = 25th percentile to 94th percentile) as measured by the reading comprehension subtest of the Comprehensive Test of Basic Skills (McGraw-Hill), the standardized test administered in the state. Dyads were formed on the basis of the authors' judgments of how well students would work together. There were five heterogeneous dyads, created either by pairing a boy and a girl, students of different ethnicities, or both. The remaining dyad consisted of two European-American males.

### *Procedure*

Overview: To create their books, the dyads worked in four 90-minute after school sessions. In the first session, the students were introduced to the task, watched the Glowbird video, and familiarized themselves with the publishing software that was used for creating the books. In the remaining three sessions, the dyads sequenced the seven video clips into which the software divides the story and then generated text to accompany each picture. Instructions for doing this included the fact that the pre-K students would

not be seeing the video and would have to rely solely on what the dyads told them in order to make sense of the story.

The instructions for the overall project stated,

> We've been asked to create some books for some young children downstairs (i.e., the pre-K students). We are all going to watch a story on video and then use the computers to make book versions of this story for these younger kids. The computers will give us pictures for the books, but it will not give us the text. That is our job. Today, we watch the video, then work on the computers in pairs to put the pictures the computer gives us in the right order so we can start putting in our text. Here are some things to keep in mind. Every good story needs to tell the reader who the characters are and needs to tell them the plot. Your book may need to be revised before it's ready to be read to the little kids.

Following the general instructions, students watched the Glowbird video as a group. Each dyad was then assigned to a computer and spent the remainder of the first session and three additional sessions creating their stories using the Little Planet Literacy Series bookmaking software (Williams et al., 1998). The software segmented the story into seven segments, each represented by the video still picture that began the segment. The first segment was the longest (about 4 minutes and 886 words) and the others much shorter, about 2 minutes each (and a mean number of 351 words). The pictures were presented in a random order and the first bookmaking activity was to put them in the appropriate sequence. The software supported sequencing by allowing students to replay each segment by clicking on the video still. Only when the pictures were in the correct order would the software allow a book to be made. A screen shot of the sequencing software is provided in Figure 2.

Once the book was made, each picture appeared on a separate page in the electronic book with space to write narration for that segment of the story. Students could type in text, add music, or audio record sounds to go with the picture. In the present case dyads were told to first type in their text. As it turned out, none of them had time to use the music or audio recording features of the software. There was also a replay button so students could replay the segment of the story represented by the picture on each specific page.

The screen shot indicated a limited space for the narration. This space did not expand by scrolling. The amount of space was

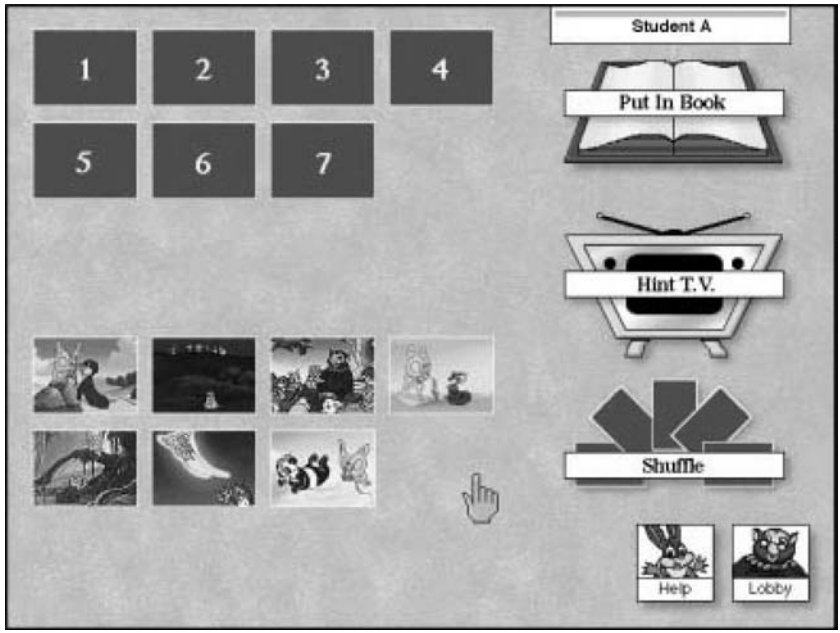


**FIGURE 2** Screen shot of Little Planet sequencing software prior to students placing pictures in the correct sequence. Each picture corresponds to a page in Figure 1.

insufficient to reproduce verbatim all of the oral narration from the video segments. Thus, children had to condense the information somehow (e.g., select and delete, construct summarizing sentences, etc.). For example, the picture depicting Beavercat and Glowbird's other animal friends covers a segment with 886 words. The fixed font of the software allows a maximum of 360 characters per page. At an average of 4 or 5 characters per word, a maximum of 72 words can fit on a page in the book. Figure 3 shows the first page of a sample book, including the space allocated for text.

While the dyads were working on their stories, each researcher was assigned to take field notes on the interactions of the dyads. In addition, we videotaped two of the dyads. The students frequently asked research staff questions about the task and stories. Staff responded with information to guide the process but did not direct the inclusion of any particular information. For example, if students asked what they should put in the stories, the research staff responded with comments such as: What do you think should


**FIGURE 3** Screen shot, in bookmaking mode, of the first page of a study 1 dyad's book.

go in? How can you figure it out? In summarizing the segments, dyads replayed the segment as frequently as they wanted to, and most dyads played each segment a minimum of six times. Due to the pragmatics of the situation, research staff were not able to precisely record the number of times each segment was replayed. The dyads did not all take the same amount of time to complete the story writing task although all took sessions 2 and 3 and part of session 4. In session 4, when they had finished creating their story, they were asked to read it over again and were encouraged to edit or revise it. If they determined that their book was finished, students were given free reading time.

The completed books were printed out by the research staff. Two weeks after completing the books, the students got together with the preschool students and read them their books. One week after that, each student in the after-school club was interviewed. They were asked to retell the story, to talk about how they figured out what to put on each page, and if they would do anything differently if they did this activity again.

## *Scoring and Coding of the Books*

We analyzed the narration in the dyads' books for length and in terms of seven content features potentially available for inclusion in the stories. Earlier, we noted that all of the oral narration in its verbatim form could not fit in the space allotted. The scoring plan was designed to index how much was written, which features of the presented story were included, and to what degree. Five of these features were the dimensions of situation models of narratives as described by Zwaan and Radvansky (1998): intentionality or goal structure, causality, time, space , and protagonists. In addition, we looked at the inclusion of scientific content and poetic elements.

Finally, we wanted an overall assessment of story quality. We obtained ratings of the quality of the stories from three independent judges who were familiar with the story.

### DIMENSIONS OF SITUATION MODELS

We coded for the presence of content that signalled each of the five dimensions of situation models. We followed the definitions provided by Zwaan and Radvansky (1998) and Zwaan, Langston, and Graesser, 1995). Intentionality refers to the goal structure of the story. To score the intentional structure we looked at inclusion of goals and of outcomes because intention can be inferred from outcomes under certain circumstances (Goldman, 1985; Goldman & Varnhagen, 1986). We scored for the presence of seven goals, reflecting three goals for the animals (finding out what happened to Glowbird, wanting Glowbird to come back, and wanting to fix up the habitat), and four for Glowbird (corresponding to the four locations she visited in an attempt to satisfy her goal of finding a suitable home). We also scored for outcomes related to the goals. There were ten of these. Each of the dyad's stories was given 1 point for each goal or outcome that was explicitly mentioned in the story narration, making the maximum intentionality score 17. Causality refers to local, causal connections between states and events. Stories received one point for each use of an explicit causal connective (e.g., because, if-then, therefore, and so). Likewise, the temporal dimension was coded based on the use of an explicit temporal reference marker (e.g., until, meanwhile, while, and then). One point was given for each use. The spatial dimension was

indexed by the use of specific references to locations (e.g., desert, forest, mountain, sky) or to relative distance and physical position of the protagonist or objects in the story world (e.g., far away, here, there). There were no maximum scores for the causal, temporal, or spatial dimensions. The extent to which the dyads kept track of the protagonists was coded by allocating one point for mentioning the two or three specific protagonists involved in the various episodes. There were a total of 15 possible points for the protagonist dimension: 2 for each of the episodes in which Glowbird visited a different habitat and met a different animal character, 2 for the first two episodes; 3 for the episode with OwlyBear; and 2 for the final episode.

Two raters independently scored each of the dyad's stories on each of these five dimensions. They agreed a minimum of 90% of the time. Disagreements were resolved in discussion.

In addition to these five dimensions of situation models, we examined three additional properties of the stories: poetic elements, science content, and story quality. Occurrences of poetic elements (e.g., rhyme, lyrical repetition, alliteration) in the dyads' stories were compared to a template of the poetic elements of the original story and one point was given for each poetic element included. Maximum score for this property was 48. Agreement by two independent raters on the rating of the poetic qualities of the stories was 91%.

The scientific content of the original story was compared against information included in the dyads' stories. A story could receive a point for each explicit reference to animals' basic needs, habitat features, interdependence of elements in a habitat, or the notion that the animals could restore Glowbird's habitat. The maximum score for scientific content was 19. Agreement by two independent raters on the rating of scientific content of the stories was 91%.

We also obtained story quality ratings from three of our colleagues who had helped develop the Glowbird story and were very familiar with it. Each "Glowbird" expert read all six of the dyads' stories. They were asked to "sort them into groups according to the quality of the story the students produced. Once you have sorted the stories, please order the groups from highest to lowest quality." We did not constrain the number of groups, but each rater generated three (high, medium, low). The ratings of the experts

were then combined to produce one overall rating for each story's quality. Agreement among the three independent raters was 75%.

## Results and Discussion

We first present the findings based on the analyses of the features of the stories produced by the dyads and their relationships to quality ratings. We then discuss findings regarding strategies for doing the task based on an analysis of the surface text of the dyads' books. These strategies receive support from the interviews with each of the students.

### *Characteristics of the Stories*

Table 1 presents the results of the analyses of the dyads' books.

#### LENGTH

There was a fairly substantial range in the length of the reconstructed stories. The shortest contained 230 words and the longest 466, as shown in the first row of Table 1.

#### QUALITY

There were also differences in the quality ratings (shown in the second row of Table 1) but these do not simply reflect differences in length. In fact, the story that received the lowest quality rating was the longest. Rather, the quality ratings appear

**TABLE 1** Characteristics of Stories Produced by the Dyads in Study 1

| Elements (totals per story) | Dyad DL | Dyad WS | Dyad DG | Dyad LT | Dyad AT | Dyad RZ |
|---|---|---|---|---|---|---|
| Avg. words/story | 466 | 230 | 326 | 352 | 322 | 345 |
| Quality | Low | Low | Medium | Medium | Medium | High |
| (Avg. of 3 raters) | 1 | 1.3 | 2 | 2 | 2.3 | 3 |
| Protagonist | 13 | 13 | 13 | 13 | 13 | 14 |
| Temporal | 3 | 5 | 4 | 6 | 2 | 5 |
| Spatial | 11 | 8 | 8 | 10 | 15 | 11 |
| Causal | 2 | 6 | 2 | 0 | 1 | 7 |
| Intentional (goal-outcome) | 7 | 8 | 7 | 7 | 9 | 12 |
| Poetic/lyrical | 19 | 6 | 10 | 4 | 7 | 5 |
| Scientific content | 3 | 3 | 1 | 6 | 1 | 3 |

to be related to differences in the completeness of the intentional structure of the stories, with differences in other dimensions of situation models minimal.

### DIMENSIONS OF SITUATIONS

Looking first at the dimensions on which the dyads were similar, all the dyads' stories showed high frequencies of naming the specific protagonists in the story. This may be due to the fact that the protagonists of each episode were featured in the video still for the page, which the students had in front of them as they created the text for the page. There were modest variations in the inclusion of temporal and spatial information. Spatial information was more salient in the stories than temporal, perhaps because in this story changes in location imply changes in time. In addition, Glowbird's goal is to find a location that suits her, so the salience of different locations is higher than location information might be in other stories.

For the most part the stories did not include explicit causal connectors between events. There were two exceptions to this, RZ and WS, both of whom provided explicit "because" statements about why Glowbird ran away and explicit "so" statements to explain the animal characters' motivation for cleaning up the environment. The remaining local causal connections in these stories were idiosyncratic, as were the few that occurred in the other dyads' stories.

With respect to the intentional structure, all of the dyads communicated the global structure of the story at least to some degree. Each provided some form of story-initiating circumstances and story conclusion wherein Glowbird returned to a restored environment, but the specificity and details varied. Where the stories were most different was in the rendition of the four episodes in which Glowbird visited different habitats. The data in Table 1 show that scores for the intentional dimension ranged from a high of 12 (70% of possible goals and outcomes included) to a low of 7 (41%). The story with the highest score (RZ) included three pieces of information for each of the four episodes: Glowbird's goal, something about the habitat she was visiting, and why it failed to meet her goal. The other five dyads were less systematic and complete. They included some of this information for some of the four episodes. The quality ratings correspond to these differences

in completeness of the intentional structure, and dyads with less complete structures received lower ratings on story quality.

### SCIENCE CONTENT

The analysis of the science content indicated that with the exception of one dyad, LT, dyads did not include very much of the science content information. For the others, neither properties of the habitats, such as the desert being sandy, or the relationship between the properties of the habitat and Glowbird's needs were consistently included. Typically if science content was included it was one specific property that made the habitat unsuitable for Glowbird (e.g., too cold for her).

### POETIC/LYRICAL LANGUAGE

The final feature we analyzed was the inclusion of the poetic language from the original story. As the data in Table 1 indicate, the story with the highest frequency of poetic elements was DL's. The DL story included almost all of Glowbird's refrain verbatim on each of the four pages in which she visited different animals in their habitats, as shown in the first column of Table 2. However, including the refrain in this way left little room for information as to why the habitat did not suit Glowbird nor for the outcome of the visit to that habitat. The result was that DL had a weak intentional structure and received the lowest quality rating. In contrast, RZ's story had only a few of the poetic elements from the original story and obtained the highest quality rating. Although RZ did not include many of the poetic elements from the original story, an analysis of the surface text indicated that they constructed some phrases that attempted to preserve the spirit of the poetic language. At the same time, these phrases left enough room to include complete goal-related information. RZ's story is provided in the second panel of Table 2.

RZ used rephrasing and summarizing so they could fit the "complete" goal and outcome into the space provided. For example, in the first encounter with Snouse (p. 2), RZ included the sequence of events that destroyed Glowbird's habitat and introduced it with the summary statement: She told him what happened to her. In the next three encounters (pp. 3, 4, 5) RZ deleted the actual sequence of events and only included the summarizing statement. Thus, they constructed and then repeated a phrase that allowed

**TABLE 2** DL and RZs stories

| The Little Planet and The Glowbird by D & L | The Little Planet and The Glowbird by R & Z |
|---|---|
| **Pg. 1**: Once upon a time, there was a place called little planet. There lived an animal named Glowbird. She ran away because she felt like she was left out. She ran away because they cut down her tree. They took all her berries. They built a dam where she drank her water. They even said she was too small to play with them. | **Pg. 1**: Once upon a time, there was a bird whose name was glowbird. She lived on a planet with no name or moonlight. The animals had the light of glowbird. But one night everyone was sad because the glowbird did not glow. That was because she ran away. |
| **Pg. 2**: Far on the other part of the earth. Glowbird was flying through the wind she flew and flew until she came to a desert. A snouse was playing in the sand. A snouse is something like a snake with the face of a mouse. The snouse said hi. Glowbird said hi. You know what happened to me. They cut down my tree. They stopped my stream. They ate my berries. They even said I was too small to play. | **Pg. 2**: Meanwhile Glowbird flew to another part of the planet. She saw a smouse playing in the sand. She told him what happened to her. They cut down her trees, took all her berries, stopped her stream, they even said,"Your to small to play". She was looking for a special place to live. That wasn't her type. |
| **Pg. 3**: Glowbird flew to an icy mountain with a goattanda. Something like a goat with the markings of a panda. You know what happened to me. They cut down my tree. Took all my berries and stopped my stream. And they even said I was to small to play. I had to leave it wasn't a very good day. I am looking for a special place that I can call my own. | **Pg. 3**: So she flew to another part of the planet where a Goatanda was playing in the snow. It was freezing. She told him what happened to her. Then, she asked him what he does there. "I play in the snow," he anwered. The snow was cold so she said that it was not her type. She flew to another place. |
| **Pg. 4**: Glowbird flew and flew until she came to a lake. She saw a sealotter playing in the water. She said, "You know what happenned to me, they cut down my tree. Took all my berries, and stopped my stream. I had to leave, it wasn't a very good day. I'm looking for a special place to call my own. And when I find that special place I'll know in my heart it is my home." | **Pg. 4**: She came to a stop at a lake, where she met a sealotter."Hi," "Hi," they greeted. She told him what happened to her. The sealotter told her that all he does there is swim and play. She wasn't very good at swimming so she went along with her mission. |

*(Continued on next page)*

**TABLE 2** DL and RZs stories *(Continued)*

| The Little Planet and The Glowbird by D & L | The Little Planet and The Glowbird by R & Z |
|---|---|
| **Pg. 5**: Glowbird flew and flew, until she came to a swamp. She met a happypotamus and said, "You know what happen to me, they cut down my tree, took all my berries, they stopped my stream. Now I'm looking for a special place I can call my own. I can't stay here it is too muddy. Bye bye! | **Pg. 5**: She flew and flew until she ran into a swamp. There was a happypottomas playing in the mud. Glowbird told him what happened to her. He told her that all he does is wollow in the mud. She liked to keep clean so she wasn't too happy and flew away. |
| **Pg. 6**: At the forest all the animals were telling Alli bear about Glowbirds disappearence. Alli bear said, "Books can help." The animals said, "Books, how can they help?" Alli bear gave them a book. She said, "read the title." One was on trees, environment, and berries. They did everything in the books. They thanked Alli bear. | **Pg. 6**: At the forest everyone was shouting all at once, about glowbird flying away. Each creature was blaming itself about one of the causes. Owleybear had a idea for everyone to help fix the forest, so glowbird might come back. The ainmals got to working. |
| **Pg. 7**: On the other part of the planet. Glowbird flew into a hard wind. And she was very tired from flying. And she saw a forest in a far far distance. When she got closer she thought she saw this place before. She remembered this is the one place she used to call home. She had gone all the way around the planet and came back to the place where she began. | **Pg. 7**: By the time the animals got done fixing the forest, they saw something glowing. It was glowbird! She traveled around the planet and came back to the her special place. The animals and glowbird lived happily ever after.<br>THE END . . . . . |

them to communicate the intentional structure of the story but in limited space.

The remaining dyads made efforts to retain the lyrical qualities of the language of the original story. Some started each page similarly. For example, LT began the habitat episodes with the roughly parallel constructions shown in the first column of Table 3.

Interestingly, this information does not also convey goal structure information. However, another dyad, DG, did convey part of the goal structure in the lyrical language of the original story by conveying the outcomes of the four habitat episodes in language highly similar to that used in the original story (i.e., "definitely

**TABLE 3** Excerpts from LT and DG Stories

| LT's story | DG's story |
|---|---|
| Page 2<br>On another part of the planet, Glowbird met a Snouse.<br>A snouse is a snake and a mouse.<br>Hello she said.<br>Do you like it here? | Page 2<br>Glowbird said, "I don't know how to slither."<br>"Just do like meeee," said the SNOUSE as he slithered.<br>Little Glowbird said, "This isn't the home for me." |
| Page 3<br>Meanwhile Glowbird met a Goatanda<br>A Goatanda is goat and a panda.<br>Hello, do you like it here? | Page 3<br>"I don't know how," said Glowvird.<br>Whwhaaaa! Like that" said the Goatanda<br>"Well deffantly isn't the home for me.<br>Besides it's too and I mean too cold." BYE," said the Goatanda. |
| Page 4<br>While Glowbird was flying around until she reached a lake.<br>A sealotter was sitting on a rock.<br>Hello, said Glowbird. | Page 4<br>"I don't know how," said Glowbird in a sad voice.<br>"SPLASH! Like that" said the Sealotter.<br>"I should be leaving."<br>BYE," said the Sealotter |
| Page 5<br>Then Glowbird flew to a swamp and saw a Happypotomus.<br>I'll tell you what a Happypotamus looks like a hippo with a head of a cat.<br>Hello said Glowbird. | Page 5<br>"It's too dirty," said Glowbird.<br>"That's the point."<br>"This is definitely not my new home. Besides it's too dirty. BYE!" |

isn't the home for me"). Segments from DG's story are provided in the second column of Table 3. Thus, the reconstructed stories reflected several interesting strategies for capturing the spirit of the lyrical language without completely sacrificing the intentional structure. However, adults' quality ratings appeared to emphasize the completeness of the intentional structure.

### *Student Perspectives*

The interviews we conducted with the students after they completed their books provide some insights into why different dyads emphasized some elements over others when reconstructing the

original story. When students were asked how they figured out what to put on each page of their book, most students indicated that they tried to include "the important things." Interestingly, when asked if they would do anything differently if they could re-write their story, both members of the RZ dyad indicated that they would try to make their story more interesting to young children by emphasizing the poetic language more. One said "I'd put more wording and stuff to make it more interesting. Like putting "they took all my berries." In fact, when this dyad first started to write their books, they tried to include more exact wording. When they got to the bottom of the first page and had not said "all the important things" they went back and deleted original wording, summarizing important events.

Other dyads were very conscious of what they perceived to be the needs of their audience and that motivated attention to certain dimensions. For example, one member of the LT dyad said, "I described 'meanwhile.' I didn't want them to think that it was right after when she came to that (next) place." Another student, a member of the high prosody dyad DL, said he left out certain things because he didn't think the young children would understand them. He added "The big goal I was working towards was to make a good book for children to read and enjoy, to laugh when they read it, to see the pictures and say, 'that's pretty neat."'

It is clear from the students' comments that they were making conscious choices about what to include. In part, this was possible because they had unlimited access to the original story with the redundant cue structure. In creating the stories for the younger students they were faced with constraints imposed not so much by memory but by "production" space. In making choices about what to include some focused on the lyrical and poetic elements at the expense of elements critical to completeness of the goal structure. Others emphasized the complete goal structure and chose not to include as much of the lyrical language. These differences and the relationship to quality ratings by adults suggested that perhaps children in the different dyads would recall the story differently. However, analysis of the story recall task administered at the time of the interview indicated that there were few differences among the students in what they recalled. All of them emphasized the goals and episodes in the story. None of them recalled the stories using the poetic and lyrical language of the story. Note that

the instructions did not emphasize using the exact wording where they could remember it. The lack of differences in memory is not surprising given the amount of time and number of exposures students had to the story.

Thus, under conditions where students had unlimited access to a story in which poetic elements were present, differences in the created stories appeared to be due to responses to the production (length) constraints and judgments about what was important in a story for young children. Students recognized that young children would find the poetic language enjoyable but only one dyad made this the dominant goal. At the other extreme, one dyad made the intentional structure their dominant goal. The other dyads, to varying degrees, included fragments of the goal structure and fragments of the poetic language from the original story. We thus saw children cope with the summary/reduction task using different strategies for meeting the joint constraints set by length and audience.

This initial exploratory study did not permit us to evaluate the mnemonic value of the poetic elements because students had unlimited access to the story during story reconstruction. The recall data indicated no differences in gist recall, with all students remembering a relatively complete episodic structure. To pursue the question of the role of poetic elements as mnemonic aids we conducted a second study in which we (a) restricted access to the story during the reconstruction task, and (b) created a reduced poetic version of the story. We compared stories reconstructed by students who heard the "less poetic" as compared to the poetic version of the story. We kept the task the same (i.e., create a story for young children) to preserve the authenticity and meaningfulness of the task.

## Study 2

In Study 2 we experimentally manipulated the degree of poetic language in the original story. Changes made to create the "less poetic" version of the story reduced the repeated use of similar sentence structures and rhyming patterns but retained the specific goal statements and science content. The changes most dramatically affected information about Glowbird's goal in the four habitat episodes and the specific words with which science content

was presented. Accordingly, if the poetic language helps students represent the story information, the students listening to the poetic version should be able to reconstruct more of the intentional structure of the story. In order to equate for other properties of the two versions, we re-recorded the original version using the same reader as for the less poetic version.

## Method

### *Materials*

We constructed a second version of the Glowbird story that substituted nonpoetic elements for many of the poetic elements in the original but preserved the meaning of the original, including the frequency with which information about Glowbird's goal and motivation was repeated. To accomplish this we altered the specific wording of various phrases by using non-rhyming words, nonalliterative phrases, and rewording other phrases that appeared repeatedly throughout the story. The changes had the effect of disrupting some, but not all, of the meter of the original wording and introduced a broader array of sentence structures and word orders than had been in the original.

Table 4 presents one of the Glowbird habitat episodes to illustrate the effect of the changes.

Notice that many of the changes were quite subtle. There was a minor effect of the changes on total words in the story. The less poetic version was 2760 words compared to the 3050 in the original version. We had the same male reader record the less poetic version and re-record the original to equate for all other auditory characteristics of the audio track. The original in this study was thus not identical to the story heard by the students in Study 1. In this second study, we will refer to the original story as the more poetic version to make this distinction clear.

### *Participants*

Twenty-two 5th grade students from the same school as the students in study 1 participated in Study 2. The range of reading scores was the same as that for study 1. Racial (2 Hispanic, 3 Asian American, 6 European American, and 11 African American) and gender (12

**TABLE 4** Comparison of Poetic and Less Poetic Story Versions for one habitat episode (Episode 3 in Figure 1)

| Poetic Version | Less Poetic Version |
|---|---|
| Glowbird was flying against the wind. She **flew and flew** until she came to the desert. A snouse was playing in the sand. | **Glowbird was flying** against the wind. She flew until she came to the desert. She saw a Snouse playing in the sand. |
| **Do you know what you'd see if you saw a snouse?** | **Do you know what a snouse is?** |
| **Something like a snake with the face of a mouse.** | **It's got a mouse's face and a snake's body.** |
| "Hello," said Glowbird. "Yesterday, they cut down my tree and took all my berries and stopped my stream and said I was too small to play. **I had to leave. I couldn't stay. It wasn't a very good day.** | "Hello," said the Glowbird. "yesterday they cut down my tree and took all my berries and stopped my stream and said i was too small to play. **I had to leave. I couldn't stay there.**" |
| **Now I'm looking for a special place.**<br>**A special place to call my own**<br>**And when I find that special place**<br>**I'll know inside it is my home."** | **Then Glowbird said, "It made me feel sad." She went on to say, "Now i'm looking for a special place to live. A place I can call my new home."** |
| "**This is a special place.** Here you can slither in the sand." | In reply the Snouse said, "**This place is great.** Here you can slither and slide." |
| "I'm not too good at slithering," said Glowbird. | "I'm not too good at slithering," said Glowbird. |
| "Have you **ever tried**?" | "Have you **ever done it**?" |
| "Well, no." | "Well, no." |
| "It's easy. Just slip and slide. It feels so good," said Snouse. | "It's easy. Just slip and slide. It feels so good," said Snouse |
| "No, thank you," said Glowbird. "Do you have a stream and a cave and **pretty purple berries** and trees? I come from a **land with lots of trees.**" | "No, thank you," said Glowbird. "Do you have a stream and a cave and **nice purple berries** and trees? I come from a **place with lots of these things.** |
| "No. Not here. But we have lots of sand. **Who needs a stream and a cave and berries and trees from another land when you have lots and lots of sand?"** | "No. Not here. But we have lots of sand. **Who needs that stuff you were talking about when you have all this sand?"** |
| "I'm sure this is a very pleasant place to be," said Glowbird. "I wish I could be like you and be happy here, but it's not for me. I think I'll go on looking for my special place. | "I'm sure this is a pleasant place," said Glowbird. "I wish i could be like you and be happy here, but it's not for me, I think I'll go on looking for my special place. |
| **"Good-bye."** | **"Good-bye it was nice to meet you."** |
| **"Good-bye."** | **"Good-bye.** |

male, 10 female) composition was similar to the diversity in the Study 1 dyads. Students were divided into two groups based on a matched-pairs procedure. The data used for matching were scores on a written summarization task these students had completed a month earlier as part of a class assignment on ancient cultures. The scores were generated using Latent Semantic Analysis (Landauer & Dumais, 1997) and reflect the similarity of the summary to the text that students read. There were 11 students assigned to each group but one from the More Poetic version (an African American male) failed to complete both sessions. These data were not included in the analyses.

### *Procedure*

The two groups of students were taken to separate rooms and listened to the More Poetic or the Less Poetic version of the Glowbird story. They were given instructions similar to those used in Study 1: "We've been asked to create some books for some young children downstairs (i.e., the pre-K students). We are all going to watch a story on video and then make book versions of this story for the younger kids." The story was played as a seven-page "book" using hypercard for the presentation. On each page, there was a single picture that was the first frame of the seven segments used in the sequencer (see Figure 2).

After the second presentation of the story, individual students were given a seven-page paper packet. On the top half of each page was the black-and-white picture from each of the seven segments of the story. These were presented in the appropriate order. The bottom half of the page was lined writing space. Students worked individually on their books and could not access the recorded version of the story. They thus reconstructed their stories based on what they could remember and given the presence of the pictures for each segment. Students all completed their books in two one-hour sessions on two successive days. They could not rehear the story on day 2.

### *Scoring and Coding*

We coded the stories for the five situation model dimensions plus science content, number of words, and poetic elements. For all but

poetic elements, the scoring procedures were the same. However, we kept goals, attempts, and outcomes separate for purposes of analysis because of the differences in the poetic language changes that were made. In coding poetic element use, we included any distinct rhythmic or repetitive pattern to leave open the possibility that students would invent poetic elements, especially for the group who heard the less poetic version of the story.

Quality ratings were done based on criteria derived from Study 1. Emphasis was placed on the intentional structure of the story and the degree of completeness or elaboration of the episodes. We did not use poetic language in the quality ratings. We classified each story reconstruction as high (3), medium (2), or low (1). The raters agreed on 81% of the cases (17 of 21 stories). Disagreements were resolved in discussion.

## Results and Discussion

Table 5 provides the means for each group on the dependent measures. The scores for the story characteristics were submitted to multivariate analysis of variance in which group (more versus less poetic) was a between subjects variable and the dependent measures were seven situation model dimensions, total words, quality ratings, poetic language use, and science content.

**TABLE 5** Characteristics of Stories Produced by Students Who Heard Poetic Compared to Less Poetic Versions in Study 2

| Elements (mean for group) | More Poetic | Less Poetic |
|---|---|---|
| Avg words/story | 339.00 | 305.55 |
| Quality | 2.00 | 1.45 |
| Protagonist | 11.90 | 12.91 |
| Intentional/goal* | 3.70 | 1.73 |
| Causal | 4.50 | 3.73 |
| Temporal | 5.90 | 6.91 |
| Spatial | 7.90 | 6.91 |
| Scientific Content* | 3.20 | 1.73 |
| Poetic/lyrical* | 5.2 | .45 |

*Note.* Maximum scores: goals = 7; poetic = 48; science = 19.

The exact $F$ statistic = 3.53 was significant at the $p = .06$ level ($S = 1$, $M = 4$, $N = 3.5$). Univariate analyses were then done to determine the locus of the overall effect.

The univariate analyses were significant ($F$s $(1, 19) > 4.71$, $p < .05$) for three of the dependent measures, goals, science content and poetic elements. Students who heard the more poetic version of the story included more goals (50% as compared to 25%), more science content (17% as compared to 9%), and more poetic elements (11% as compared to less than 1%) than those who heard the less poetic version. There was also a trend for quality, although the significance level was higher than the conventional level, $F(1, 19) = 3.39$, $p = .081$. The mean quality rating of stories produced by students who heard the more poetic version ($M = 2.0$) was higher than the mean for the stories produced after hearing the less poetic version ($M = 1.45$). The frequency distribution of individual quality ratings is also informative and is provided in Table 6.

Of the students who heard the more poetic version, 80% attained quality ratings of medium or high. Of those who heard the less poetic, only 36% received medium or high ratings, $\chi^2(1, N = 21) = 4.073$, $p < .05$.

Interestingly, groups did not differ on the length of the stories they produced nor in the inclusion of causal, temporal, spatial, or protagonist dimensions. Lack of differences in the last three may be related to the presence of the pictures for each page. The differences in scenes may have cued students to mention different spatial locations and to include a temporal transition from place to place. Thus, the impact of changing the wording was ameliorated by the pictorial cues to space and time changes. The same is true for the protagonist dimension.

**TABLE 6** Frequency Distributions for Quality Ratings in the More Poetic and Less Poetic Groups

| | Quality rating | | |
|---|---|---|---|
| | 1 | 2 | 3 |
| More poetic | 2 | 6 | 2 |
| Less poetic | 7 | 3 | 1 |

A correlational analysis of the dependent measures was conducted to examine covariation of the various story features that we coded. The analysis revealed significant correlations ($p < .01$, $df = 19$, unless otherwise noted) in the sample as a whole for several of the features. First, the quality ratings were significantly correlated with number of words ($r = .73$), attempts ($r = .59$), and outcomes ($r = .59$). However, attempts (to reach a goal) and outcomes (of the attempt) were not significantly correlated. The quality correlations reflect the elaboration criteria used in the quality ratings. Quality was also significantly correlated with science content ($r = .68$). This correlation is an artifact of the overlap of science content and outcomes, which were also significantly correlated ($r = .58$). Outcomes were also significantly correlated with causal connectors ($r = .58$), reflecting the tendency of children to conclude episodes with the words "So ⟨outcome⟩." Poetic language use was correlated with goal inclusion ($r = .51$, $p \leq .02$) and with spatial terms ($r = .52$, $p \leq .02$). Thus, those students who tended to include more goals were also the ones who included more of the poetic, lyrical language.

The following excerpts from two students' versions of the episode 2 (involving Glowbird's encounter with the Snouse) exemplifies some of these co-occurrence tendencies:

The first is from a story the judges ranked as high in quality:[3]

> Glowbird flew far, far away.
> Then she saw a snous.
> Snous liked to slither in sand a be in hot weather.
> Glowbird did not like sand nore hot weather.
> So Glowbird flew on in search of a new home.

The second is from a story the judges ranked as low in quality:

> She came to a desert and met a snous.
> She is trying to find a new home.
> Snous likes where it lives.*

The results of Study 2 provide evidence that the use of poetic language in children's stories served a mnemonic function for certain kinds of information. Children who heard the more poetic version included more of the goals and science content

[3]We have left the spelling and grammar of the students' books intact.

elements particularly affected by our manipulation of the language in which the story was told. This raises the question of whether poetic language could be systematically employed to scaffold children's attention to the goal structure of stories and to content information.

## General Discussion

Following Gee (1986) we have formulated a number of tentative hypotheses regarding the functions of lyrical language in stories. First, it appears that the lyrical aspects of children's stories may serve as (a) memory cues that aid children in their story comprehension, (b) help children encode information about stories in meaningful ways for storage in LTM, and (c) act as cues to facilitate the retrieval/recall of that information about the story from LTM to be used in working memory. Ultimately, we see overt lyrical and poetic language as a possible tool for parents, teachers, and children's authors to use in scaffolding young children in the development of the skills they need for discourse comprehension and production.

There may be implications for older students as well. As Study 1 demonstrated, poetic language can sometimes aid comprehension, but it can also sometimes be a hindrance to encoding a story's goal structure. This is demonstrated in the cases of Study 1 dyads DL and RZ. The story of RZ suggests that they did not need the poetic structure to facilitate their comprehension (although they thought it would aid younger readers). The story DL that produced suggests that the poetic language of the original story caused them to over attend to the poetic surface structure of the story and thus under represent the goal structure of the story they created for younger children.

This has a number of potential implications for educators and parents who are trying to scaffold older children in the process of learning to read. For one, in terms of learning to decode, poetic language may be a helpful tool if it focuses children's attention on to the distinct sound patterns of a language. Furthermore, as is demonstrated in Study 2, it can under certain circumstances aid in story comprehension.

It may be problematic, however, if it leads the person learning to read into focusing attention on phonetic aspects of a language

at the expense of the semantic aspects. From this perspective one may argue that prosody may be useful for elementary or middle school age children who are still learning basic decoding skills and forming text-base understandings of the individual propositions in a story, but it may be counterproductive in helping them learn to form situation models of the overall meaning of a story. That is, comprehension in terms of understanding the overall meaning of a narrative may be lost or seriously diminished if one over attends to the prosodic elements of the story.

Moreover, authors of children's literature for students in the elementary school years seem to reflect this inconsistency in the usefulness of prosody for older children. Some authors of literature targeted at elementary school students still rely fairly heavily on prosodic devices such as alliteration or rhyme (e.g., the works of Roald Dahl) while other elementary level works do not (e.g., the works of Laura Ingalls Wilder).

Perhaps authors of children's literature targeted at any age group should take into account the purpose of their writing and seriously consider the effects of both under using or over using prosody as should parents and teachers.

This leads to a word of caution on the inherent limitations of both of the studies we have thus far undertaken. First, our samples were small and located in only one geographic region of the United States. This makes any generalizations tentative at best. Second, our methodology is itself evolving. Thus, in these studies we focused on the role of prosody in picture books for children. It may well be that prosody in books without pictures affects memory for the stories in very different ways than it does in picture books. Thus, it would certainly be interesting to conduct an experiment in the future on the effects of prosodic language in texts that contain no pictures.

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## Appendix A

The first two episodes establish the goal for the animals on the Little Planet: The old forest where they live is dark because Glowbird has left. The Little Planet animals are very sad and they look all over for Glowbird. They do not find her but they do realize that they have destroyed her home. They find out that Beavercat cut down Glowbird's favorite tree so he could make a new dam. The dam set off a chain of events that destroyed her food and made it easier for her predator, the squirt fish, to attack her.

Meanwhile, Glowbird left the old forest to find a new home in a habitat that meets her needs since the old forest no longer did (Episodes 3, 4, 5, 6, and 9). She flies to four different habitats. In Episode 3 Glowbird flies to the desert where she meets Snouse. She tells him that she is looking for a new home because her old home was destroyed. He describes the desert and what a great place it is to live. But Glowbird says it doesn't meet her needs because it is too warm and sandy.

The same sequence of exchanges goes on at three more locations: arctic, lake, and swamp. At each place Glowbird meets an

animal that is well adapted to that habitat but the habitat does not meet her needs.

Meanwhile, in the old forest, the Little Planet animals talk with Owly Bear, a mentor figure (Episodes 7, 8). They tell Owly Bear how they have destroyed Glowbird's habitat and she is gone. They decide that they are all responsible and, at Owly Bear's suggestion, they do research and fix up the habitat. Finally, in the last episode, Glowbird arrives back at the old forest and discovers that the animals have restored her habitat and have really missed her. Glowbird decides to stay in the old forest and they live happily ever after.