Video storybooks as a bridge to literacy

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Summary

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Shared book reading functions as a leg up to successful participation in our educational system; it enables command of academic language and academic reasoning. The language in children's books is sophisticated with many unfamiliar words and complex sentences and may thus be out of reach for young children who are rarely exposed to storybooks. From extensive book reading research so far appeared that children who are read to on a daily basis, have a huge educational advantage compared to children who are not. Contemporary versions of print picture storybooks on screen not only include static pictures next to the spoken text but also video, music and sound that portray the story's events. One of the reasons for the present research was the hypothesis that such multimedia additions to picture storybooks may support preliterate L2 children's understanding of a story as events are visualized to a greater extent than static pictures. Video storybooks more clearly show how story events evolve and may thus provide a strong support for children's emerging comprehension of story content and story language.

To test whether video additions support L2 children's story understanding and language acquisition we contrasted in a first experiment the outcomes of exposure to two different versions of the same digital storybook. Both story formats were presented on a computer screen; both included the same oral text spoken in the same voice but the video version included a video-like presentation created with animation and cinematic techniques such as zooms, pans, cuts, music, and sound effects. Despite the mesmerizing video additions, children did not ignore the story language as some scholars expect. On the contrary, video, music and sound effects combined with the spoken text led to an increased understanding of the story and the story's vocabulary and syntax compared to children who heard the same story text with static pictures added.

Although children have to process oral and visual information presented at a set rate and visual information unlike in the static version cannot be re-inspected, synchronized visual and oral information like in the video storybook seems to stimulate

learning. It is a remarkable finding that video additions were especially effective for gaining knowledge of implied elements of stories that refer to goals or motives of main characters, and of vocabulary and syntax. The effect on the story's vocabulary and syntax was strengthened over sessions. This first small-scale study thus supported the hypothesis that multimedia storybooks provide a framework for understanding stories. This study was one of the first that highlights advantages of video on young children's learning.

The second experiment replicated the advantages of video storybooks. Another aim was to test the hypothesis that the video format of storybooks supports learning because of children's willingness to continue their attempts to negotiate meaning from a story text when children are repeatedly exposed to a story. The amount of mental effort that children invest in independent encounters with stories will hardly reduce with repetition when children's appraisals of coping potential remain at a high level. When appraisals of coping are low the amount of invested effort may decrease with every repetition. Previous research has demonstrated that frequent breakdowns in understanding as may be expected when children are less proficient in understanding text, result in less overall expenditure of effort and lower achievement.

As an indicator of mental effort, skin conductance was monitored during book exposure. The results support the hypothesis that mental effort as demonstrated by the number of skin conductance responses remains at a higher level when a video storybook is repeated. The number of skin conductance responses remained stable over sessions when children "read" the video storybook, contrary to the children who heard the story with static pictures. In the latter group, the rate of skin conductance responses significantly declined over sessions, suggesting that low appraisals of coping potential resulted in selective disengagement from the task. It may indicate that children in the video condition continued to invest mental effort in processing the story text because they perceived the task as a challenge that was within their reach and this in turn promoted learning of new words and phrases. The finding that video storybooks are sufficiently engaging for young L2 children at-risk to keep them attentive even when the scores on retellings show that they fail to understand parts of the text supports the usefulness of computer technology in early school education.

In a third experiment we tested effects of storybook reading on the depth of vocabulary knowledge that preliterate L2 children acquire from exposure to storybooks. Based on the dual coding theory (Paivio, 2007), we hypothesized that having an image to a word enhances learning of the word. The close temporal proximity of words and images in

video storybooks makes it more likely that the “reader” is able to build mental connections between verbal and visual representations and thus develop memory traces that connect details of pictures with phrases in the narratives. The associations might be precise enough to store word knowledge that is needed for expressive vocabulary tests, i.e., producing the correct word for an image. When children encounter an unfamiliar word in the story text while looking at a static illustration with its many visual details they may not always succeed in targeting the correct visual referent for the word in time to establish an association between the spoken word and its depiction. As static illustrations represent the complete event, it may be relatively hard for children to know which part of the illustration to focus on in order to form strong associations between words and visual details in pictures. Children may remember something about the visual context in which they heard a word, leading to improvements in receptive vocabulary, i.e., the ability to identify semantic content.

Even though the percentage of unknown words (about 4%) amply exceeded the permitted maximum quantity of 2% unknown words, the L2 pupils learned words from the target text receptively and expressively, however, seldom the same words both ways. Further analyses indicated that receptive vocabulary knowledge seems to be formed as a first step and appears to be more easily gained as was shown by the fact that no differences between video and static format were found. Looking at a scene depicted in a static illustration provides enough information for a preliminary understanding of a word. However, readings with the addition of video were found to improve the depth of vocabulary knowledge. A major finding of this study was that the for literacy acquisition so important expressive vocabulary was especially promoted through reading a digital storybook with video additions.

In the fourth experiment we tested whether animation of storybooks is a worthwhile investment for all young L2 learners. Though video storybooks are likely to be motivating for most children due to the attractive multimedia features, these additions may only effect children’s cognitive skills in the very beginning stages of learning a second language. Not all L2 learners may need the step by step depictions of the different stages in an action as video presents to create a mental representation of story actions. For pupils more proficient in language the oral narration combined with static pictures may suffice. On the other hand, gaining insight into causal relations within the story may cause problems even for kindergarten children who are more proficient in language. Without guidance in selecting relevant visual information as is provided by the video storybooks

more complex story information, like the state of minds of characters as reasons for actions may be well out of kindergartners' reach. In the same line, most children's vocabulary might benefit from video. Being able to connect a concrete image to a novel word due to the close temporal proximity of word and image in a video storybook might promote learning expressive knowledge of story vocabulary more than static pictures.

To test the effect of L2 proficiency on story comprehension and language learning we contrasted children with low and high L2 proficiency based on their scores on a standardized language test. All children had repeated encounters with the story with either static pictures or video. The results demonstrate that children use the additional information to their advantage but only when the information is out of their reach. Children more proficient in language did not need the video additions to understand story actions, but for less advanced L2 children actually showing the story actions in great detail makes a huge difference. On the other hand, story information that is not easily understood benefits from video for all L2 children. Seeing actions and their consequences vividly portrayed brings motives to young children's attention and raises children's understanding of the story from a very basic to a more sophisticated level. Furthermore, all children's vocabulary benefits from video storybooks. This may indicate that the precise coordination of visual information and words in the video storybook will be beneficial to all children even L1 children. However, the latter waits further testing.

Story comprehension and expressive vocabulary are precious assets in education; our results indicate that video storybooks can make a significant contribution to these skills thus making a difference for young L2 children's school success. Differences in academic skills resulting from early exposure to storybooks could be diminished when children would visit Internet fora that provide a virtual library of digital storybooks on a regular basis.

We have begun a series of experiments to test our hypothesis that video additions more so than static pictures benefits retention of novel words because children can more easily form connections between words and their respective images. In the final experiment it was therefore tested if children indeed attempt to connect the story language with visual information in illustrations. Static illustrations in children's books provide a rich source of visual information that can help children to understand the story content. However, not all story content is depicted in an illustration. For instance movement can only be suggested and the same applies to change. And how does one depict a word like *impossible* or *charming*, not infrequent words in children's storybooks. Furthermore, many

illustrations go beyond the text thus providing irrelevant details that could elicit a child's attention. We looked at children's eye gaze patterns during their first encounter with a static digital storybook and compared this to the fourth encounter with the same storybook.

There were indeed numerous visual details that had no connection to the story text ranging from 32 to 58% for the five stimulus books. However, children did not appear to randomly single out interesting details in static illustrations when listening to a story. The way children processed an illustration seemed governed by a desire to understand more of the story. Children fixated more and longer on details that were highlighted by the text than on other visual details. With time, when children had become more familiar with the story they became even more focused making fewer but longer fixations. This intention to match visual details in illustrations to the story text can support children's retention of the story language as words are anchored to images and thus explain the beneficial effect of video additions to digital storybooks where the matching process is facilitated. However, the latter hypothesis waits further testing. Human figures appear to be most informative to young children.

The overriding interest in details that are connected to the story does not preclude interest in other salient visual details, occasionally they look at details that go beyond the story text but the main focus is on details that are central to the story and this attention for details not mentioned in the text remained more or less stable. Children fixated more and longer on human figures than other details highlighted by the text. This may be because human figures are the driving force in a story, they hold the spotlight and determine how the story progresses.

In sum we conclude that websites with video storybooks - also called living books - may offer new opportunities for young children from families with low literacy levels, who suffer from word poverty when they enter school. New routines with multimedia books on the computer may not only enhance children's enjoyment of reading, but also help them to become competent and avid readers.