Producing rhythmic beat gestures while retelling a story: positive effects of a gesture-based training session on children's narrative performance

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Recent research with preschoolers has given evidence that observing and listening to storytellers who are also performing rhythmic beat gestures (e.g., hand gestures that typically associate with prosodically prominent positions in speech) favor story memorization and comprehension [1, 2, 3], and also lead to better subsequent narrative performance in terms of narrative structure scores in a narration task [4]. Nevertheless, to our knowledge, no study to date has addressed the possible effects of encouraging children to produce rhythmic beat gestures while retelling narratives on their performance –as opposed to merely observing them–. Our hypothesis is based on evidence that suggests that gesturing has beneficial effects on various cognitive and linguistic domains (see [5] for a review). Moreover, as beat gestures may boost narrative performance due to their role in highlighting important structural properties of language (such as focus, discourse structure and rhythm [6, 7]), we are also led to believe that they can be the root of potential beneficial effects in narrative production and development.

In this study, a total of forty-seven 5- and 6-year-old children participated in a brief between-subject training study with a pretest and an immediate posttest design (Fig. 1). Following a pretest, which consisted of recounting a cartoon they had been shown, the children watched a set of six short videotaped stories told by storytellers who performed beat gestures with prosodic prominence in target positions within the story. One half of the children were then asked to merely retell the story they had seen without any instructions regarding gesture (*beat non-encouraging condition*), while the other half were asked to retell the story they had seen and imitate the beat gestures that were used by the storyteller (*beat encouraging condition*). Both groups then performed a posttest, which was identical in procedure to the pretest. The animated cartoons used in the pretest and posttest were different from those stories of the training, but they all followed a similar narrative structure. Video recordings of the pretest and posttest narratives were then scored for narrative structure and fluency. Narrative structure was rated on a scale of 0 to 6 (6 = complete goal-based narrative). Fluency scores were exclusively based on a perceptive coding scale from 1 to 7 (1 = extremely disfluent and 7 = extremely fluent). Results for narrative structure (Fig. 2) showed a main effect of Test ($F(1, 184) = 25.194$, $p < .001$) and a significant interaction between Condition and Test ($F(1, 184) = 6.167$, $p = .014$). Fluency scores (Fig. 3) revealed a main effect of Test ($F(1, 184) = 18.277$, $p < .001$) and a significant interaction between Condition and Test ($F(1, 184) = 4.649$, $p = .032$). The findings showed that children in the group that had been encouraged to use beat gestures (*beat encouraging*) received significantly higher gains in the quality of their posttest narratives in terms of narrative structure and fluency scores compared to the group of children who had merely recounted the story without previous gesture instruction. All in all, this evidence suggests that encouraging the use of rhythmic beat gestures in children helps boost their subsequent narrative performance. This research can have an impact on our understanding of children's gesture and narrative development, as well as practical implications for teaching methodologies.

Keywords: beat gestures; prosody; narrative discourse performance; between-subject training study

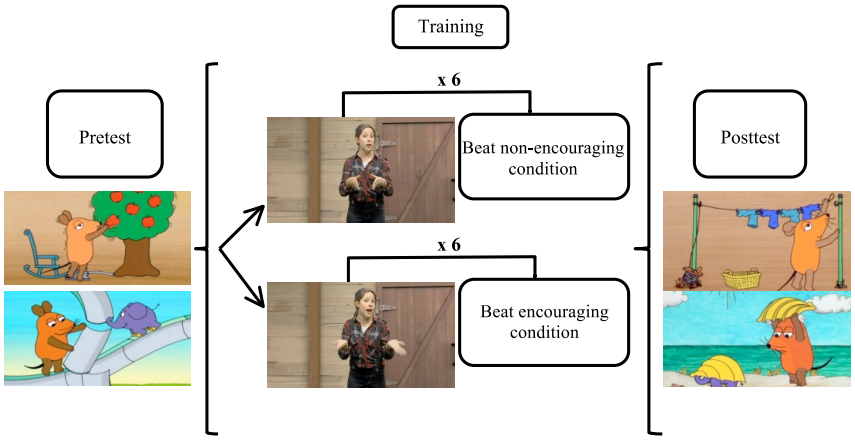

Fig. 1. *Experimental procedure*.

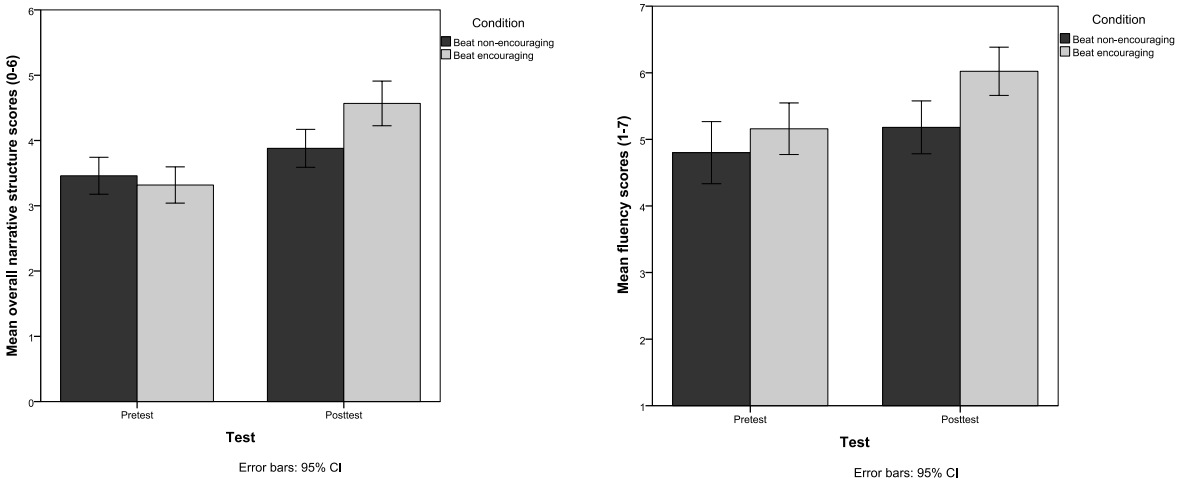

Fig. 2 & 3. *Mean overall narrative structure scores from 0 to 6 and fluency scores from 1 to 7, separated by training condition and test. Error bars represent 95% confidence intervals of the means.*

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