Contextual modulation of reading rate for direct versus indirect speech quotations

Bo Yao, Christoph Scheepers
Institute of Neuroscience and Psychology, University of Glasgow, Scotland, UK

Introduction

In human communication, direct speech (e.g., Mary said: “I’m hungry”) is perceived to be more vivid and perceptually engaging than indirect speech (e.g., Mary said [that] she was hungry) (Clark & Gerrig, 1990). However, while many of us share the intuition of an “inner voice” particularly during silent reading of direct-speech statements, there has been little objectively measurable confirmation of this experience so far. Recent embodied cognition theories propose an inherently perceptual representation of language (Barsalou, 1999, 2008). Based on these proposals, we predicted that readers are more likely to engage in perceptual simulations of a reported speech act while reading direct speech as opposed to meaning-equivalent indirect speech quotations.

Experiment 1

- **Stimuli**
  Twenty-four quadruples of short fictitious stories were prepared as reading materials. (The critical regions/quotations are in bold font)
  1. It was a typical British day, rainy and gloomy. Sixteen-year-old pianist Bobby was going to play in the quarter-finals of a local talent competition. He was extremely nervous before his performance.
     a. His mother encouraged him but he was all shaking and said: “No! I can’t do it! This is the end of the journey because it is unlikely that I will make it this time.”
     b. His mother encouraged him but he was all shaking and said that he couldn’t do it and that it was the end of the journey because it was unlikely that he would make it this time.
     His mother tried to calm him down, saying that it’s not the winning that counts, but the taking part.
  2. It was a typical British day, rainy and gloomy. At Glasgow Royal Infirmary, an old man was dying, and too weak to sit up. His family members were sitting around the bed, feeling sad. He wanted to say something, so his daughter placed a cushion under his head.
     a. Slowly, he looked around and said: “I’m grateful you’re all here. This is the end of the journey because it is unlikely that I will make it this time.”
     b. Slowly, he looked around and said that he was grateful for their coming and that it was the end of the journey because it was unlikely that he would make it this time.
     Then he closed his eyes and everyone burst into tears.

- **Task (oral reading)**
  To read out the stories from the script in one go and as naturally and fluently as possible.

- **Results**
  Less than 5% of the trials were excluded due to repetition or substitution errors. For the valid trials, reading rates during reading of the critical regions were quantified in Syllables per Second. They were submitted to ANOVAs by subjects and items. There was a significant Context × Quoting Style interaction (F(1, 19) = 8.90, p < .01; F(1, 23) = 6.40, p < .02).

  <table>
  | Oral reading rates (in syllables per second) for the critical quotations |
  |-----------------|-----------------|-----------------|
  |                 | Fast-speaking context | Slow-speaking context |
  | Direct speech   | 6.3              | 6.7              |
  | Indirect speech | 5.5              | 5.7              |
  | Error bars indicate the Standard Errors |
  |-----------------|-----------------|-----------------|
  </table>

  This suggests that participants engaged in spontaneous vocal re-enactments of the reported speech act when reading aloud direct rather than indirect speech quotations, by adjusting their oral reading rates to the speech rates that were contextually implied.

  Exploiting the interaction, it was found that direct speech quotations were read out significantly faster when the context implied a fast-speaking rather than a slow-speaking quoted protagonist. By contrast, no such contextual modulation of oral reading rate was found for indirect speech quotations.

Experiment 2

- **Stimuli**
  Same as Experiment 1.

- **Task (silent reading, eye-tracking)**
  To silently read the stories on the screen while eye movements being monitored by an eye-tracker.

- **Results**
  Fixations on the critical regions were summarised in terms of (1) first pass reading time, (2) the number of fixations during first pass reading, and (3) the average duration of first-pass fixations.

  Outlier trials were removed in 2 steps: (1) trials were excluded where first-pass reading was not fluent, operationally defined by a Fixation Distribution Disparity of more than 2.2. Next, trials with a first-pass reading time of more than 2SD above an item’s condition mean were excluded. In total, 85 (7.4%) of the trials were excluded. Data from the remaining 1067 trials were submitted to ANOVAs by subjects and items.

  There was a significant Context × Quoting Style interaction in first pass reading time (F(1, 47) = 15.52, p < .001, F(1, 23) = 4.34, p < .05). Direct speech quotations were read significantly faster when the context implied a fast-speaking rather than a slow-speaking protagonist, whereas no such Context contrast was found for indirect speech quotations. Hence, not only oral readers (Experiment 1), but also silent readers adjust their reading rates to the contextually implied speech rate when reading direct speech as opposed to indirect speech quotations.

  <table>
  | First pass reading times (in ms) for the critical quotations |
  |-----------------|-----------------|-----------------|
  |                 | Direct speech   | Indirect speech |
  | Fast-speaking context | 1900            | 2000            |
  | Slow-speaking context | 1700            | 1800            |
  | Error bars indicate the Standard Errors |
  |-----------------|-----------------|-----------------|
  </table>

  For numbers of first-pass fixations, the Context × Quoting Style interaction was significant by subjects and marginal by items, F(1, 47) = 11.87, p < .002, F(1, 23) = 3.52, p = .074 (Table 3) and for average durations of first-pass fixations, a similar, but weaker interaction was found, F(1, 47) = 4.41, p < .05, F(1, 23) = 1.83, p = .19 (Table 4). Overall, it appears that readers were making both fewer and shorter first-pass fixations on direct speech quotations when the context implied a fast-speaking quoted protagonist.

Conclusion

These significant Quoting Style × Speech Rate interactions support the hypothesis that readers are more likely to engage in perceptual simulations of the reported speech act when reading direct speech quotations as opposed to meaning-equivalent indirect speech quotations. Most interestingly, direct speech quotations appear to elicit such perceptual simulation processes in both modalities. That is, not only oral readers, but also silent readers of direct speech quotations adjust their reading rates in accordance with the speech rate that is contextually implied by the story.

References


Contact Info

Bo Yao
Institute of Neuroscience and Psychology, 59 Hillhead Street, Glasgow G12 8QB, UK
+44 (0)141 330 8902
b.yao@psy.gla.ac.uk