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Everyday Event Perception Reads Like a Book

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Introduction

In everyday experience, people are confronted with streams of information that they must segment into discrete, meaningful units, on several levels of organization. Discourse offers one example: when people listen to speech or read text, they must segment it into words, clauses, and sentences. Theories of on-line discourse processing propose that people construct a representation of linguistic information that is updated whenever the listener or reader reaches the end of a unit (e.g., van Dijk & Kintsch, 1983). Supporting this claim, reading time is longer for words at clause boundaries compared to words within clauses. Reading time increases even more at sentence boundaries, presumably as a result of integration processes. This *wrap-up time* at unit boundaries is important for accurate memory and predicts later text recall (Haberlandt & Graesser, 1989; Haberlandt, Graesser, Schneider, & Kiely, 1986).

Like speech and text, everyday events like making a bed are segmented into distinct actions, on several levels of organization (Zacks, Tversky, & Iyer, 2001). Are non-linguistic events processed in the same way as speech and text? The present study tested whether observers of everyday events also demonstrate *wrap-up time* effects at meaningful unit boundaries.

Methods

40 participants viewed one of four filmed activities (e.g., *cleaning a dorm room*) that was transformed into a slideshow by sampling 1 frame/second. Slideshow viewing was self-paced, and looking times for each slide were measured. Participants studied the actions for later recall. After a recall test, participants identified levels of organization in the activity by viewing the film version of it and pressing a key to segment separate actions. Participants segmented the film 3 times. Half segmented small units first, and increased unit size on each subsequent viewing. Half did the opposite.

Results and Discussion

Looking time data for each participant was log transformed to reduce positive skewness. The data were then de-trended by fitting a power function and obtaining the residuals. Segmentation data was binned into 1-s intervals corresponding to individual slides in the slideshow. For each participant, slides were categorized as falling within an action unit, or on a unit boundary. Slides that fell on unit boundaries were subcategorized based on level of organization: *fine, intermediate*, or *coarse*.

Significant *wrap-up effects* were found: participants looked longer at unit boundaries ($M = 0.18$ log msec, $SEM = 0.03$) than within-units ($M = -0.02$, $SEM = 0.03$), *paired-t*$(39) = 5.62$, $p < 0.001$. As Figure 1 shows, looking time at unit boundaries increased linearly as level of organization increased, $F(1, 32) = 5.10$, $p < 0.05$. This parallels findings in text processing that readers look longer to process unit boundaries as unit-size increases from words, to clauses to sentences.

Also paralleling effects in text processing, looking time at *coarse*-level boundaries predicted more actions recalled, partialling out the total looking time for all slides, $r(37) = 0.33$, $p < 0.05$. Thus, *wrap-up time* at unit boundaries was related to memory for the event sequence. Combined, these results suggest that observed activities are segmented and processed in cycles, like discourse.
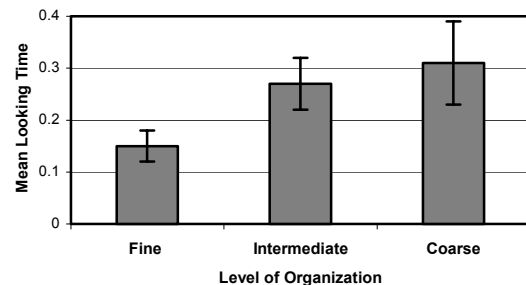

Figure 1: Mean looking time at unit boundaries.

Acknowledgments

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