Effects of Prosodic and Syntactic Segmentation on Discourse Processing and Speech Production

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The objective of the present study is to experimentally investigate the cognitive processes of spoken language comprehension and production, and more specifically the effects of different configurations of prosodic and syntactic structure in a task involving memorisation and restitution of procedural discourse. Our experiment has been inspired by the Free Distortion Task (Albertini et al., 2013) in which participants listened to stimuli controlled for prosodic and syntactic structure and were asked to reformulate. We have adapted this experimental paradigm, shifting from the clause level to the discursive level, by manipulating the prosodic and syntactic segmentation of longer utterances (inspired by the model in Simon & Degand, 2011).

Each participant listened to three tutorials (a recipe, a craft project and a gardening task). The same information content was presented in four conditions: (1) simple syntactic units [SU] with congruent prosody, (2) complex syntactic units with congruent prosody, (3) simple syntactic units grouped within larger prosodic units [PU], and (4) complex syntactic units segmented into smaller prosodic units. The resulting 12 recordings were split into 8-13 utterances (duration: mean = 6.25 s, σ = 1.57 s, min = 2.11 s, max = 9.97 s). Participants listened to one utterance at a time and were asked to repeat it (and potentially reformulate) immediately afterwards, so as to avoid overtaxing their working memory. Their speech production was recorded along with the time elapsed between the end of the stimulus and the onset of speech. A Reading Span test (Desmette et al., 1995) was also administered. Participants listened to all three tutorials and were randomly assigned to a different condition for each tutorial. Recording from 41 participants (2 h) were transcribed, annotated and analysed for prosodic and syntactic structure, and information content.

We hypothesise that the configuration between syntactic and prosodic segmentation in the responses is affected by the cognitive load induced by the memorisation task and the syntactic complexity of the input; therefore, we expect that the number of mismatches between prosodic/syntactic boundaries will be significantly higher in conditions (2) and (4) compared to conditions (1) and (3). We also hypothesise that, as long as the memorisation task remains manageable, the stimuli segmentation configuration primes the response segmentation configuration; therefore we expect that in condition (1), the ratio of realisations of one SU within one PU (congruent prosody) will be higher that the average ratio, and that in condition (3), the ratio of groupings of multiple SUs within one PU (grouping prosody) will be higher than the average ratio, at both individual and group level. With respect to this priming of segmentation, we do not expect significant differences between conditions (1) and (3). Finally, we expect a negative correlation between the quality of the restitution (stimulus information units present in each response), and the number of boundary mismatches and frequency of hesitation-related disfluencies.

References

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