REFERENTIAL OVERSPECIFICATION IN RESPONSE TO THE LISTENER'S COGNITIVE LOAD

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According to the Uniform Information Density hypothesis (UID; Jaeger 2010, inter alia), speakers strive to distribute information equally over their utterances. They do this to avoid both peaks and troughs in information density, which may lead to processing difficulty for the listener. Several studies have shown how speakers consistently make linguistic choices that result in a more equal distribution of information (e.g., Jaeger 2010, Mahowald, Fedorenko, Piantadosi, & Gibson 2013, Piantadosi, Tily, & Gibson 2011). However, it is not clear whether speakers also adapt the information density of their utterances to the processing capacity of a specific addressee. For example, when the addressee is involved in a difficult task that is clearly reducing his cognitive capacity for processing linguistic information, will the speaker lower the overall information density of her utterances to accommodate the reduced processing capacity?

To investigate this question, we consider the case where a speaker must describe a referent for a listener by choosing a referring expression that uniquely identifies it. Prior work on referring expressions has extensively investigated the degree to which such referring expressions involve audience design, but these studies yielded mixed results. UID provides us with a clear hypothesis: to avoid processing difficulty, speakers should spread out information over more linguistic material when their addressee is noticeably experiencing an increased cognitive load. This should result in more overspecified expressions: referent descriptions that contain redundant information.

We conducted a referential communication experiment set in a driving simulator. The speaker was seated in the passenger's seat, and described pieces of furniture for their addressee, who was behind the steering wheel. Speakers were instructed to describe each target object in such a way that the addressee could identify the referent from a set of furniture objects appearing on the driving simulator screen. The target objects could be identified by mentioning a particular set of properties (a minimal description) concerning its color, size and/or orientation. Any expression using more properties than necessary to uniquely identify the referent was considered overspecified (Koolen, Goudbeek, & Krahmer 2013). The listener had to pick out the correct referent while performing a driving task. The listener's cognitive load was manipulated by varying the difficulty of the driving task (either driving a straight road or performing a more complex tracking task). We predicted that the speaker's descriptions would be more overspecified in the difficult than in the easy driving condition.

Preliminary results showed a higher degree of overspecification when the listener was under increased cognitive load, but only for those objects that could be identified by mentioning their type only (e.g., people said 'the large red sofa' when 'the sofa' would be sufficient). At the same time, for objects that required mentioning at least one attribute (e.g., when there were both a red and a blue sofa), descriptions contained fewer words in the difficult than in the easy driving condition. These findings may suggest a tradeoff between spreading out information over longer expressions and not overloading the addressee with too much linguistic material.

References

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