Prominence guides incremental interpretation: Lessons from obviation in Ojibwe

Christopher Hammerly (University of Minnesota), Adrian Staub, & Brian Dillon (UMass Amherst)

Existing work has shown that animate nouns are more likely to be predictively encoded as agents compared to inanimate nouns under incremental ambiguity [1,2,3]. The present study investigates how a previously unexplored type of “prominence” information, obvation, affects argument structure processing. Obviation organizes animate third persons according to their discourse prominence: The noun that refers to the entity “in the spotlight” is designated PROX(IMATE), while all others are marked OBV(IATIVE). Like animacy, obviation can be described through the Person-Animacy Hierarchy (1; PAH). The question explored here is whether the PAH is generally employed such that higher ranked nouns are more likely to receive predictive agent interpretations. Using a visual world paradigm that allows interpretations to be incrementally probed, we ask if the PAH is recruited in Border Lakes Ojibwe, an Algonquian language of Ontario, to process argument structure. We show that PROXIMATE arguments are predictively interpreted as agents in an analogous fashion to what has been claimed for animate nouns.

The critical stimuli (2) are RCs crossed by two factors: HEAD obviation (PROX/OBV) and VOICE (DIR/INV). To interpret the sentences, the combination of obviation and voice must be used. DIRECT (-aa) indicates PROX acting on OBV, and INVERSE (-igo) the reverse. 32 experimental sentences were interspersed with 16 fillers. Sentences were recorded by a speaker of Ojibwe and played auditorily. The sentences include a critical period of ambiguity where the obviation of the head noun has been encoded, but the disambiguating voice information has not yet been encountered. The question is whether listeners make assumptions about the thematic role of the head noun during this period. 16 speakers of Ojibwe participated in a visual world task schematized in (3). Participants first saw a fixation cross, followed by three visual stimuli. Two of the images were role-reversals, where the head noun was either the agent or patient. A third distractor image depicted the same action but excluded the head noun. After familiarization, a sentence played. Participants then selected the image associated with their final interpretation via a touch screen. During the trial, a webcam recorded gaze direction, which was used to observe which image participants looked at as the sentence unfolded to determine incremental interpretation.

The ROI is the period of ambiguity. Look proportions towards each image collapsed across levels of VOICE (which has not been encountered) are in (4). The analysis consisted of a series of cluster-based permutation tests [7]. The main comparison was between looks towards agent versus patient images. There was an effect of HEAD (p = .005), with contrasts showing a cluster of significance (p = .013) such that increased looks towards the agent image occurred following proximate heads, but no differences following obviative heads. The findings support the hypothesis that PROXIMATE nouns are incrementally interpreted as agents under ambiguity.

A logistic mixed effects model on picture selection accuracy (5) revealed a main effect of HEAD (p < .001) such that proximate is more accurate than obviative, and an interaction between HEAD and VOICE (p < .001) such that inverse was associated with increased accuracy with obviative heads, and decreased accuracy with proximate. The main effect of obviation is consistent with a passive-like analysis of the inverse (e.g. [4]), where proximate patients are promoted to subject position. This leads to increased accuracy via the “Subject Gap Advantage” [e.g. 5], as proximate nouns always occupy the syntactic subject position. The interaction between HEAD and VOICE is interpreted as an agent-first preference: Assign the agent role before non-agentive roles [e.g. 6]. When voice is congruent with the head being the agent, accuracy is high as reanalysis is not necessary. This also suggests an analysis of the lack of looking preference with obviatives: There is a conflict between a patient encoding based the PAH, and an agent encoding based on the agent-first preference—these preferences cancel out. This differs with proximates, where both the PAH and agent-first preference point towards agent encodings. The findings support a model where prominence effects are unified under the PAH, providing an explanation for why the same types of effects appear with different types of prominence information (i.e. animacy, obviation) and across a typologically diverse set of languages (e.g. Indo-European, Algonquian).
(1) 1/2 (PARTICIPANTS) > 3 (PROXIMATE) > 3’ (OBVIATIVE) > 0 (INANIMATE)

(2) a. ... gichi-a'yaa gaab-apii' -aa/-igo -d inini -wan
   ...elder.PROX  REL-laugh  -DIR/-INV  -3  man  -OBV
   ‘...the elder (PROX) who is [laughing at the man/being laughed at by the man]’

   b. ... gichi-a'yaa  -n  gaab-apii'  -aa/-igo  -d inini
   ...elder  -OBV  REL-laugh  -DIR/-INV  -3  man.PROX
   ‘...the elder (OBV) who the man {is laughing at/is being laughed at by}’

(3) Outline of task. Images were randomly generated in the left, right, or bottom of the screen. Initial responses could be changed, with final responses registered by pressing the check mark. Sentences could be repeated by pressing the icon in the lower left corner.

(4) Critical ROI looking results

(5) Picture selection results