

Prominence guides incremental interpretation: Lessons from obviation in Ojibwe

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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, *obviation*, 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**.

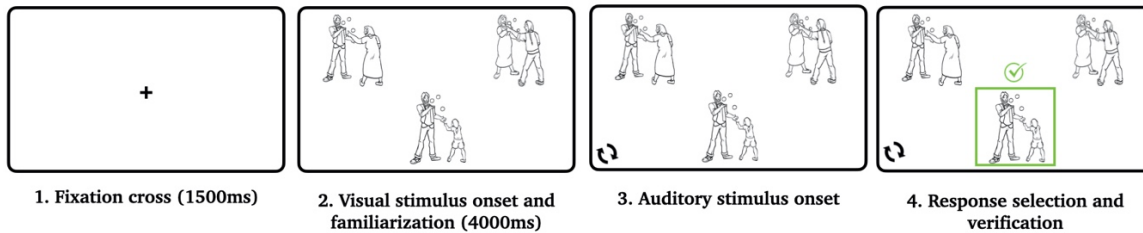
A logistic mixed effects model on picture selection accuracy (5) revealed a main effect of HEAD ($p < .001$) such that proximate is more accurate than obviative, and an interaction between HEAD and VOICE ($p < .001$) such that inverse was associated with increased accuracy with obviative heads, and decreased 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' (OBIATIVE) > 0 (INANIMATE)

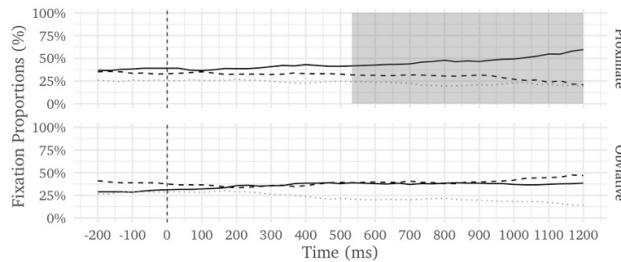
(2) a. ... **gichi-aya'aa** gaa-baapi' **-aa/-igo** -d inini -wan
 ...**elder.PROX** REL-laugh **-DIR/-INV** -3 man -OBV
 '...the elder (PROX) who is {laughing at the man/being laughed at by the man}'

b. ... **gichi-aya'aa -n** gaa-baapi' **-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.*



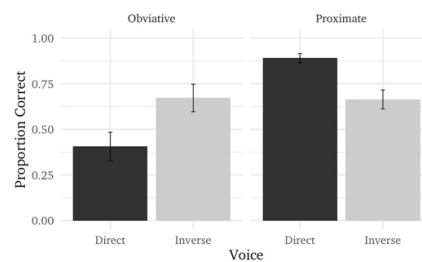
(4) *Critical ROI looking results*



Main Effect of Head	Cluster (ms)	CMS (z)	p-value
Agent v. Patient	433–1200	55.55	*0.005
Distractor v. Agent	—	—	—
Distractor v. Patient	0–1200	29.02	0.078

Contrast	Head	Cluster (ms)	CMS (z)	p-value
Agent v. Patient	Proximate	533–1200	48.54	*0.013
	Obviative	—	—	—
Distractor v. Agent	Proximate	0–1200	-112.39	*0.001
	Obviative	367–1200	-74.17	*0.009
Distractor v. Patient	Proximate	0–133	-7.60	0.185
	Proximate	267–933	-38.52	*0.010
	Obviative	0–100	-5.96	0.221
	Obviative	267–1200	-96.87	*< 0.001

(5) *Picture selection results*



Effect	z	p-value
HEAD	3.39	*< 0.001
VOICE	0.60	0.548
HEAD:VOICE	3.67	*< 0.001

[1] Gennari & McDonald (2008) Semantic indeterminacy in object relative clauses. [2] Wagers & Pendleton (2016) Structuring expectation: Licensing animacy in relative clause comprehension. [3] Wagers et al. (2018) Grammatical licensing and relative clause parsing in a flexible word-order language. [4] Bruening (2005). The Algonquian inverse is syntactic: Binding in Passamaquoddy. [5] Kwon et al. (2010). Cognitive and linguistic factors affecting subject/object asymmetry: An eye-tracking study of prenominal relative clauses in Korean. [6] Bornkessel-Schlesewsky & Schlewsky (2009). The role of prominence information in the real-time comprehension of transitive constructions: a cross-linguistic approach. [7] Barr et al. (2014) Using a voice to put a name to a face.