Universal biases in Algonquian-specific contexts

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Linguistic and Cognitive Science Meet Diversity Workshop
Max Planck Institute for Evolutionary Anthropology
Leipzig, Germany
July 1, 2024

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At a high level, one goal of my research program is to answer these two questions in a harmonic fashion, using a variety of methods and tools.

Understanding argument structure

A major task in language comprehension is to **arrive at a representation of who is doing what (to who)**. With a simple transitive event:

- Who is the *agent (do-er)*? Who is the *patient (undergo-er)*?

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  2. Use of passive voice (promotes the patient to subject position)

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- This sentence is hard on a number of dimensions:
  1. Violates heuristics (who is likely to be an agent)
  2. Use of passive voice (promotes the patient to subject position)
  3. Use of "object" relative clause (makes a long movement dependency)

Guiding Questions

Why are some movement (filler-gap) dependencies harder to process than others?

1. What effect does *person-animacy* information have? Specifically obviation, a system common in Algonquian languages

2. How is *voice* used? Specifically direct-inverse agreement systems

The testing ground: Filler-gap processing in relative clauses in Border Lakes Ojibwe.

Subject Gap Advantage

S*ubject relative clauses* (and subject gaps in general) are easier to process than *object relative clauses* (e.g. Kwon et al. 2010 for a review)

Animate SRC: *There's **the senator** who ___ quoted the journalist.*

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- When correct (with SRCs) processing is easy.
- When not correct (with ORCs) processing is harder due to reanalysis.

Animacy and the Subject Gap Advantage

Inanimate SRC: *There's **the report** that ___ quoted the journalist.*

Inanimate ORC: *There's **the report** that the journalist quoted ___ .*

Animacy Effect: The "subject gap advantage" is diminished or disappears when the head noun is inanimate (Mak et al. 2002; Traxler et al. 2005; Gennari & MacDonald 2008; Wagers & Pendleton 2016).

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➡**Animate** nouns lead to a **strong** subject-gap (or agent) prediction

➡**Inanimate** nouns **weaken/erase** the subject-gap (or agent) prediction

Proposal: The PAH guides incremental commitments

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A generalization: Higher ranked categories on the PAH engender strong subject/agent gap predictions than lower ranked ones

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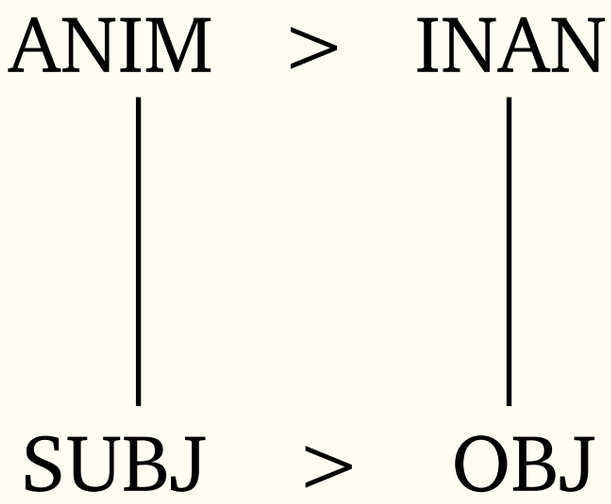

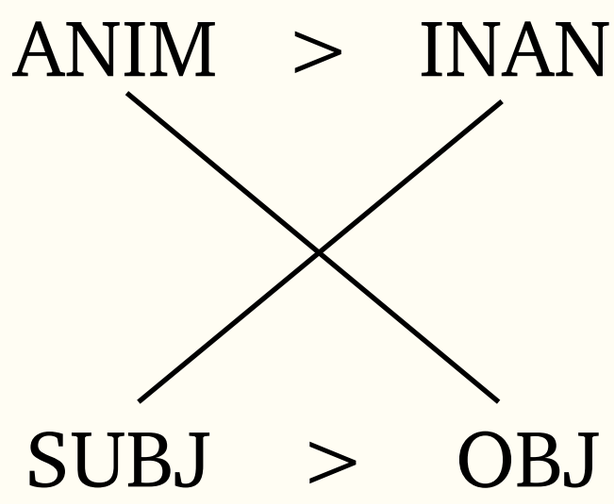

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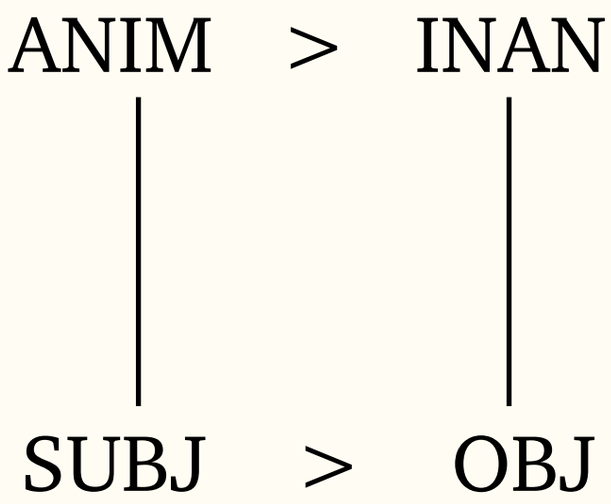
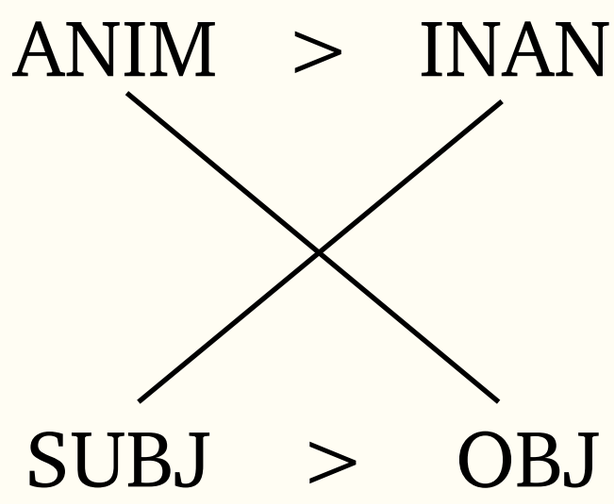




Question: What about other categories on the PAH?

Ojibwe Quick Facts

1. An Algonquian language, spoken around the Great Lakes Region of North America

2. As many as 90,000 speakers across a wide variety of dialects, including L1 and L2 speakers

3. It is called Anishinaabemowin by speakers of the dialect of interest here

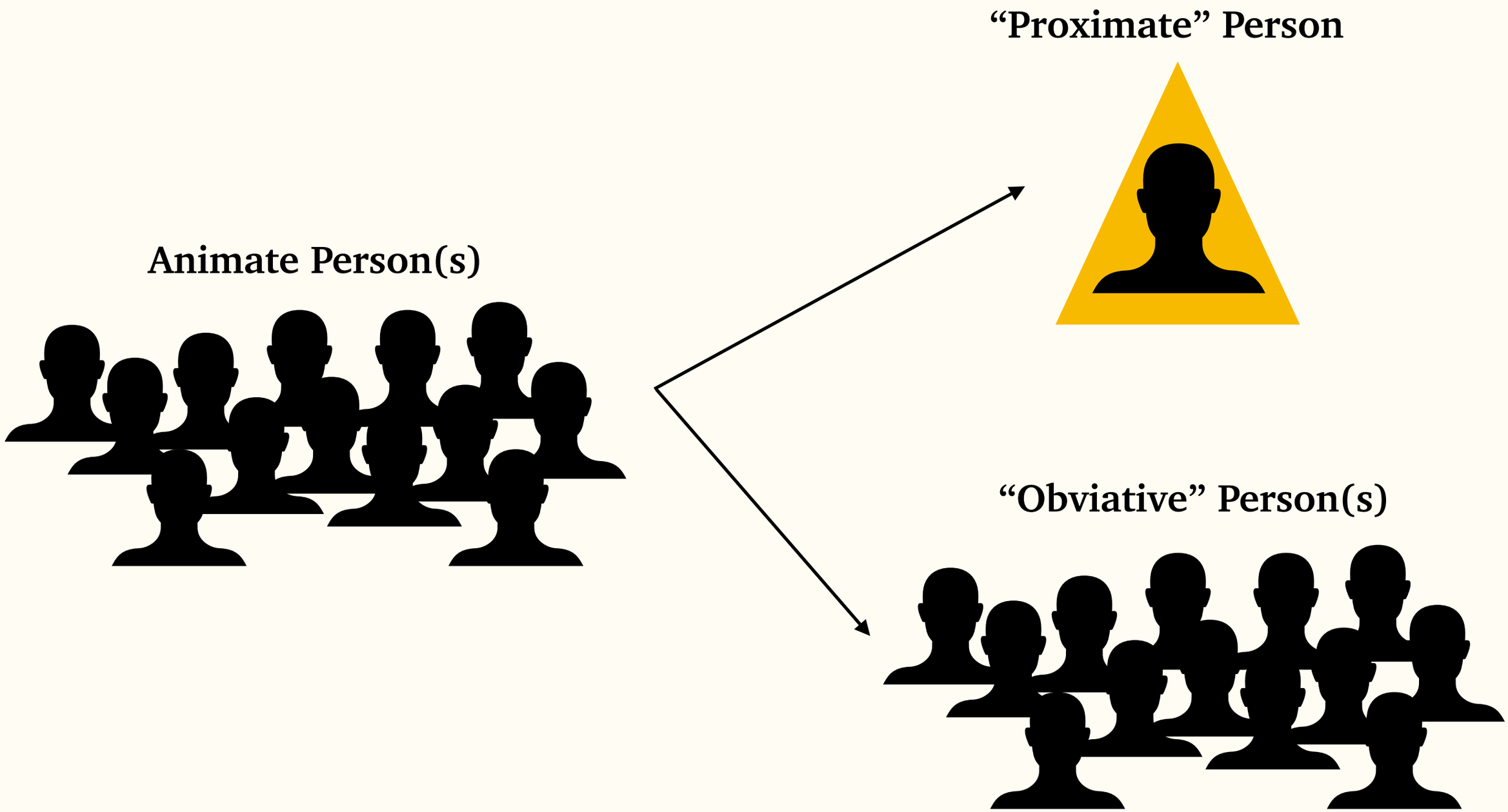
4. The data presented here is from work with speakers of the Border Lakes dialect (within the broader dialect group of Southwestern Ojibwe), spoken in Northwest Ontario

Border Lakes Ojibwe

Nigigoonsiminikaaning
(Red Gut)

Seine River

What is “obviation”?



Obviation: Transitive Sentence

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o-baapi’-**aa**-n iniwe abinoojiin-yan awe ikwe
3-laugh-**DIRECT**-OBV that child-OBV that woman.PROX
“That woman (PROX) is laughing at that child (OBV)”

“DIRECT”
PROX → OBV

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"That child (PROX) is being laughed at by that woman (OBV)"

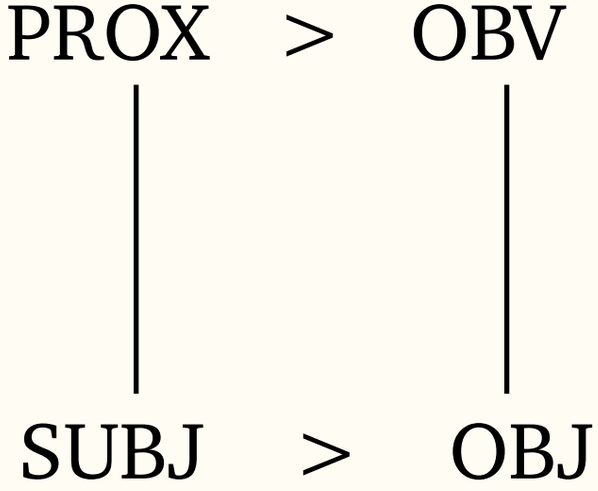
"INVERSE"
OBV → PROX

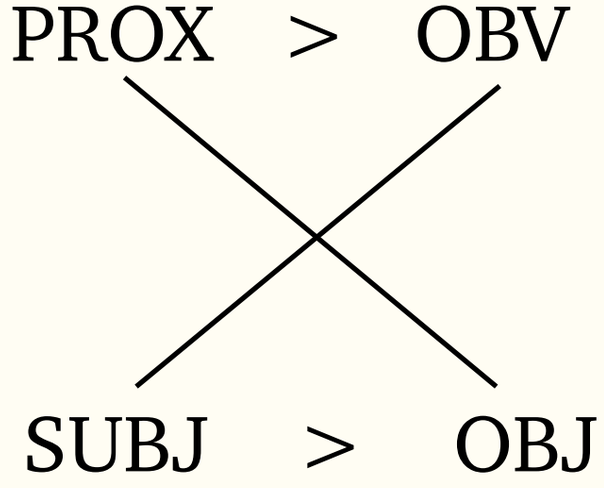
Proposal, again: The PAH guides incremental commitments

The generalization: Higher ranked categories on the PAH engender strong subject/agent gap predictions than lower ranked ones

Expanded PAH: LOCAL > PROXIMATE > OBVIATIVE > INANIMATE

"Direct" alignments are *expected* over "Inverse"





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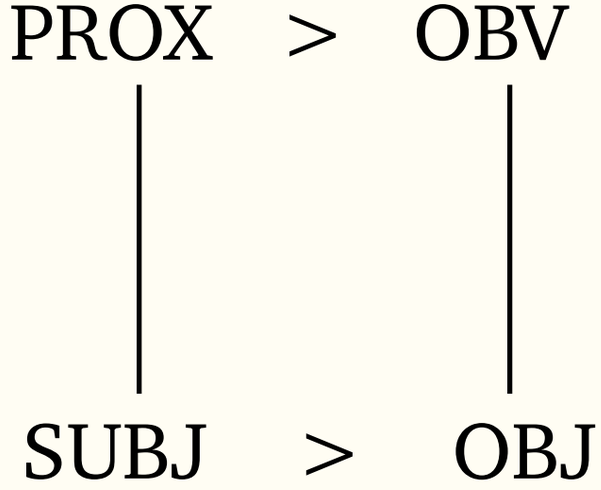

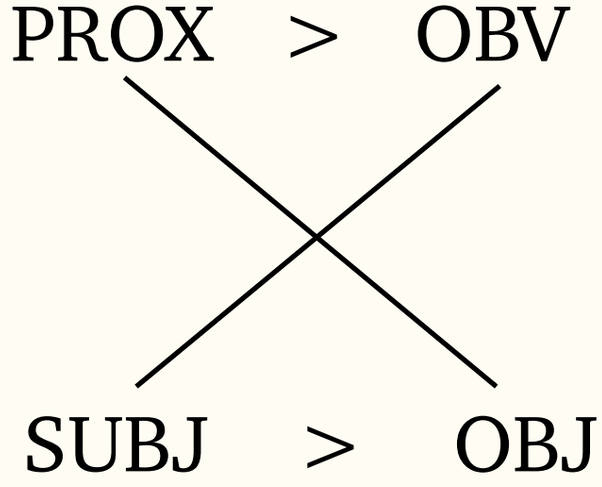

Hypothesis: Like animate nouns in English, proximate nouns in Ojibwe should be predictively encoded as subjects/agents.

The current study

Cognition 225 (2022) 105122

Contents lists available at ScienceDirect

Cognition

journal homepage: www.elsevier.com/locate/cognit

Person-based prominence guides incremental interpretation: Evidence from obviation in Ojibwe

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Outline of the task

*Choose the picture with **the elder** who ___ is laughing at the man.*

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Stimuli Design

Onaabandan mazinaakizon …
chooose picture
“Choose the picture with…”

… **gichi-aya’aa** gaa-baapi’-aa-d inini-wan
… **elder.PROX** REL-laugh-DIRECT-3 man-OBV
“… **the elder (PROX)** who __ is laughing at the man(OBV)”

Head = Proximate
Voice = Direct

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Stimuli Design: Analysis Regions

…Preamble…	*Ambiguity!*	*Disambiguation!*		
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… elder -OBV	REL-laugh-	INVERSE-3	man.PROX	**Voice = Inverse**
… gichi-aya’aa-n	gaa-baapi’-	aa-d	inini	**Head = Obviative**
… elder -OBV	REL-laugh-	DIRECT-3	man.PROX	**Voice = Direct**

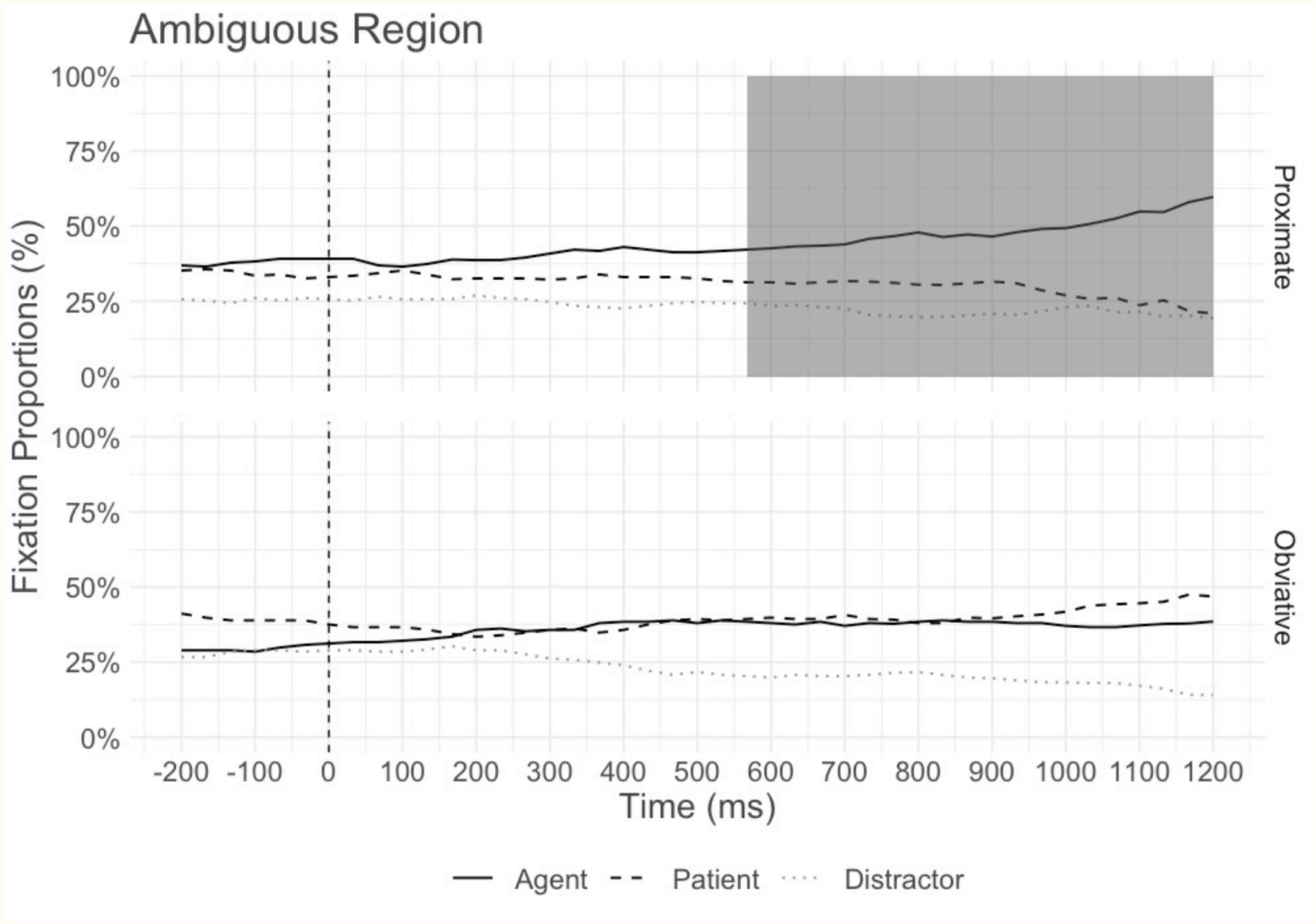
The main question

During the ambiguous region, where it is not yet known *for sure* whether the head noun is the agent or patient, do Ojibwe listeners make an assumption based on obviation?

- By looking at how people's eyes move around to different pictures during this region we can ask…
- …do they look more at the picture where this noun is the *agent* or do they look more at the picture where this noun is the *patient*?

We also looked at the final image selection responses; feel free to ask about these results in the question/discussion period!

Ambiguous Region Looks



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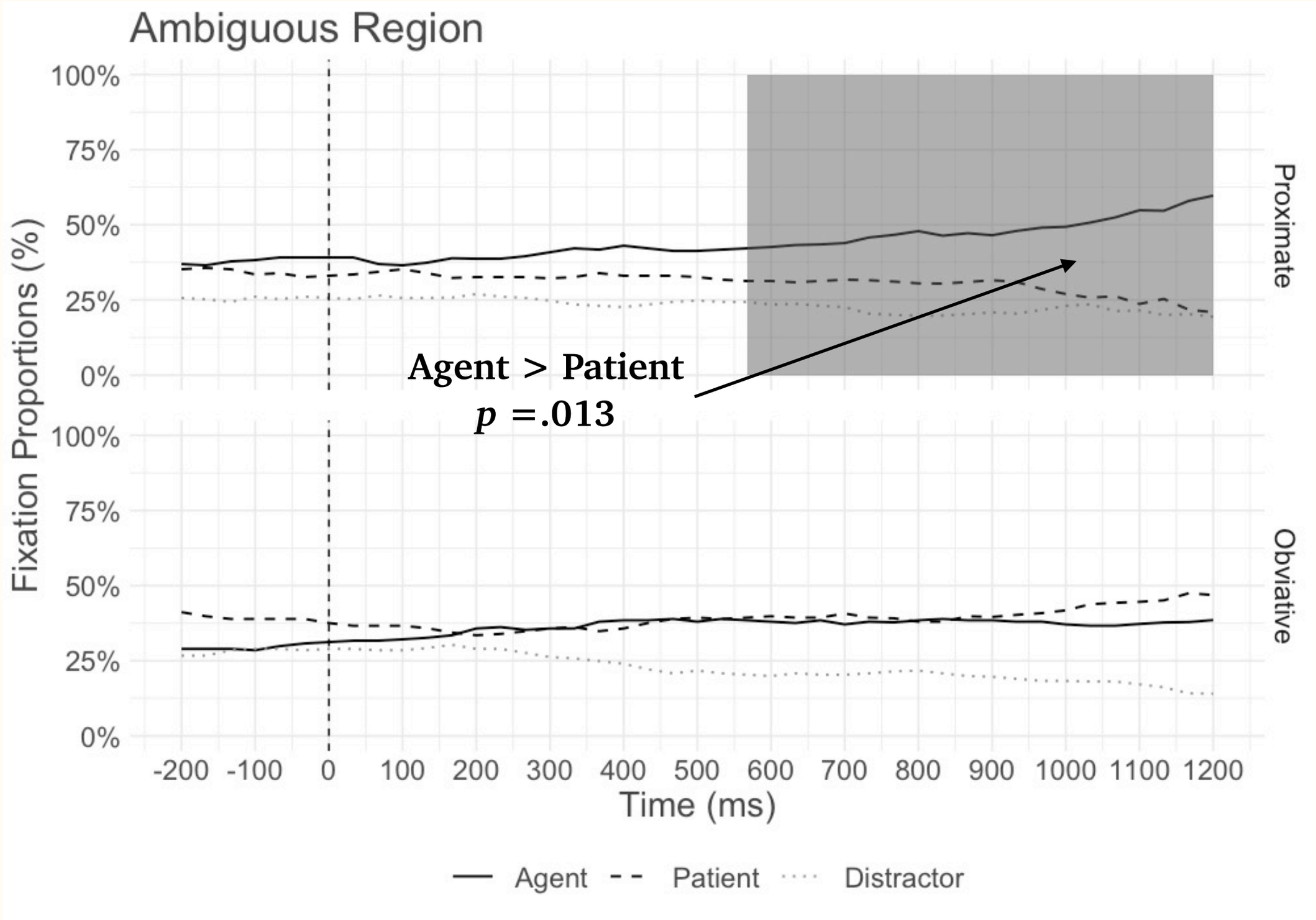

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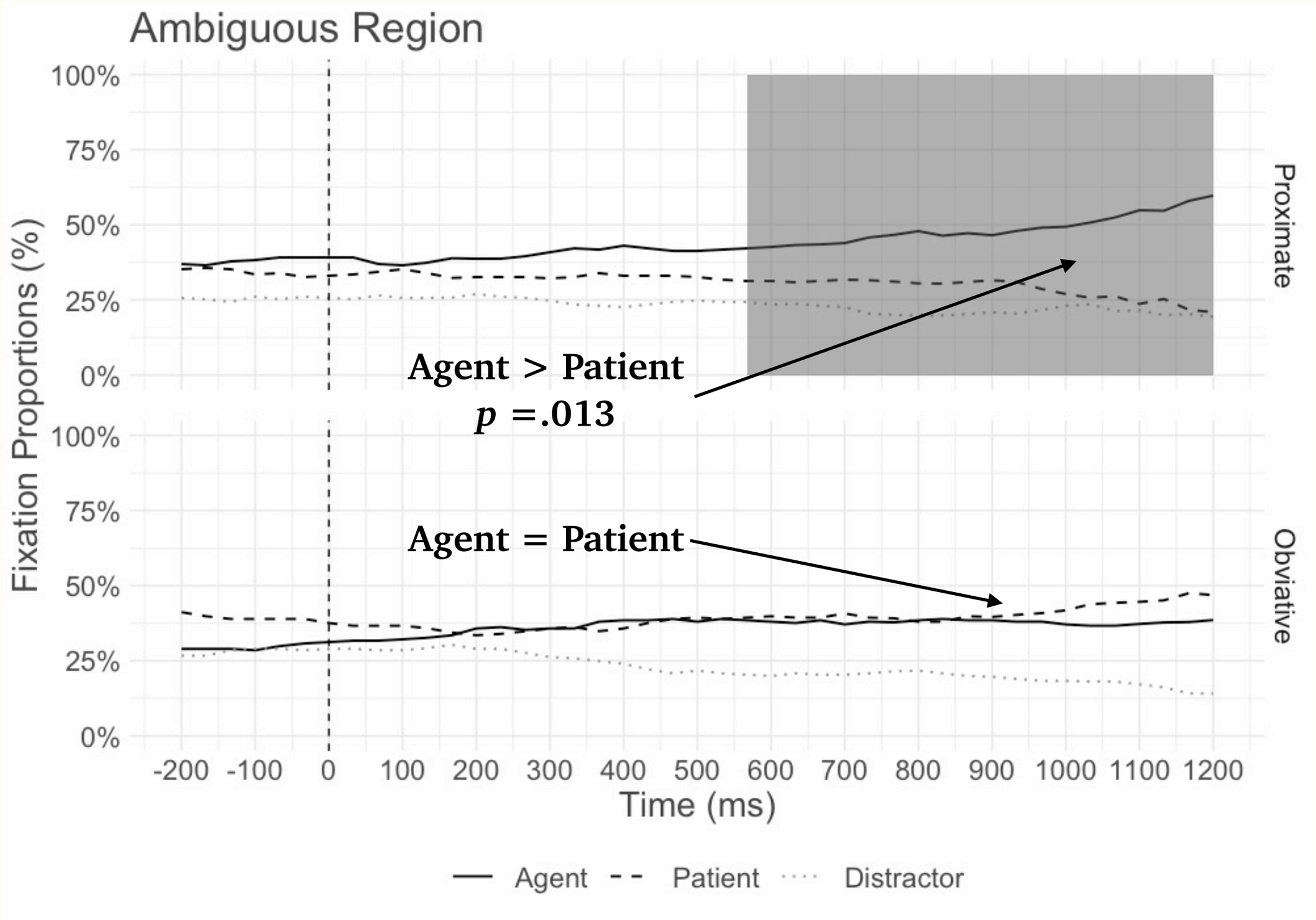


Summary of results

Under ambiguity (before Voice):

- Anticipatory looks towards the agent image with proximate heads
- No preference with obviative head nouns

This is just what we expected based on the analogy with animate versus inanimate nouns!

One unanswered question to this point: Why do inanimate and obviative nouns lead to *no preference* rather than *object/patient* preferences?

The Proposal in a nutshell

There are **two competing pressures** (critical to this narrow discussion) in argument structure processing:

1. **Agent First Preference:** Assign agent role to the first noun in the sentence you encounter, regardless of animacy/obviation.
2. **PAH Alignment Preference:** Align agent role with higher ranked categories, and patient with lower ranked categories

Returning to the results

Under ambiguity (before Voice):

- Anticipatory looks towards the agent image with proximate heads
  - ➡ Agreement between pressures: Agent-First (Filler = Agent) and PAH Alignment (Proximate = Agent)
- No preference with obviative head nouns
  - ➡ Conflict between pressures: Agent-First (Filler =Agent) and Proximate-Agent (Obviative = Patient) preferences.

Agreement between pressures leads to strong agent prediction, conflict between pressures leads to lack of any prediction!

Lessons

- There are **various pressures**, and they often compete, leading to complex interactions. These pressures are very general and are not unique to Ojibwe.
- Ojibwe speakers make *active us*e of obviation information (i.e. person-based prominence information) as a sentence unfolds.
- The effect of obviation has the exact same profile as animacy, allowing for a unified account of the two phenomena
- Learners and linguists alike can make use of these findings to understand what it means to speak and understand Ojibwe.

An abbreviated *miigwech*!

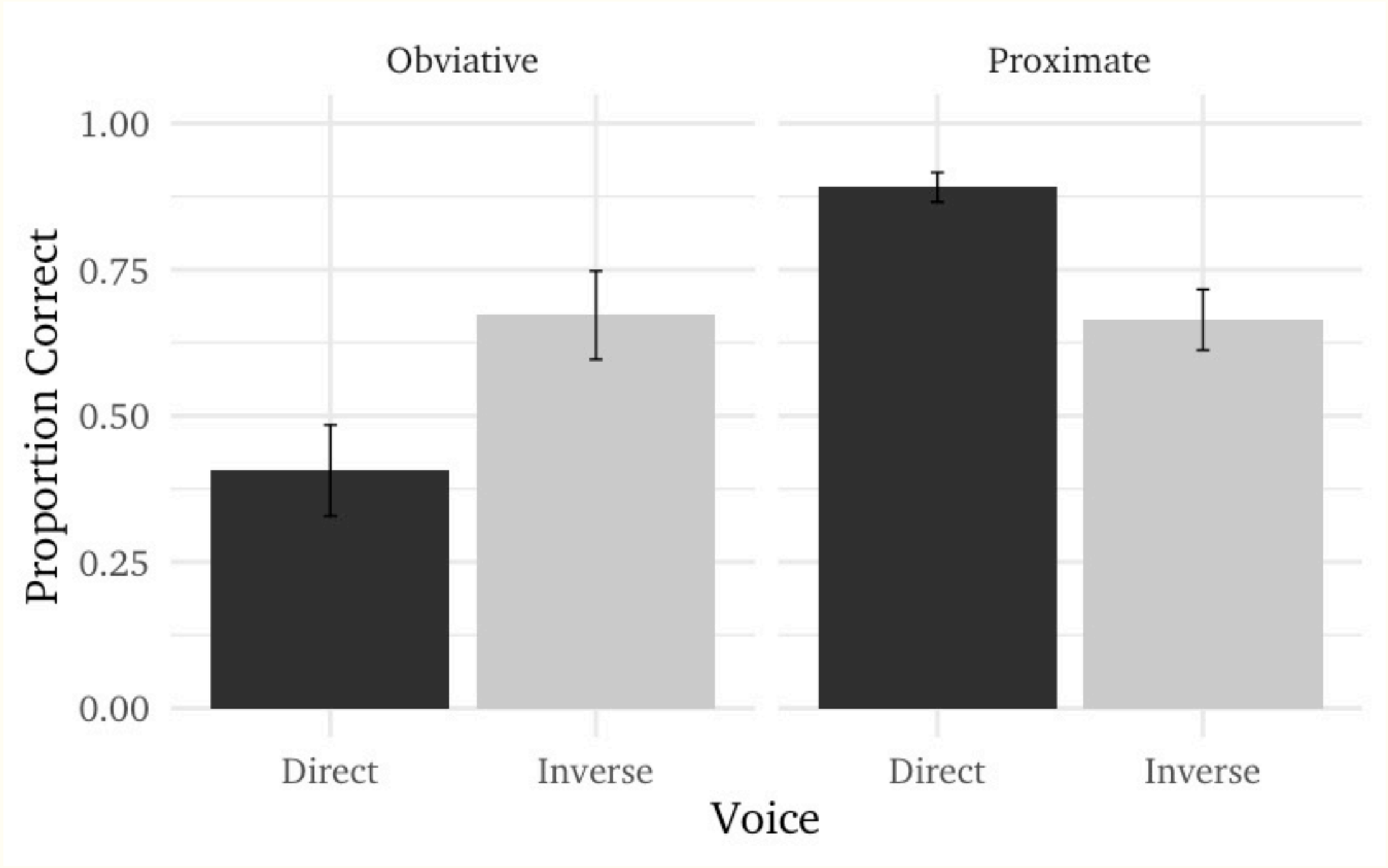
The communities at *Seine River* and *Nigigoonsiminikaaning*, particularly Nancy Jones, Don Jones, and Andrew Johnson for recruitment, stimuli help, and support. Also, Elijah Forbes for the amazing art for the study.

My dissertation committee, **Brian Dillon, Rajesh Bhatt, and Adrian Staub**, as well as the whole psycholinguistics and syntax community as UMass. Thanks also to Claire Halpert and the UMN colloquium audience, and audiences at UBC, the University of Toronto, and the 52nd Algonquian Conference, CUNY 2021, the Move & Agree Forum, and the reviewers and editors at Cognition for previous feedback.

The *National Science Foundation* for financial support via a *Doctoral Dissertation Research Improvement Grant* and the *Graduate Research Fellowship Program*. Also, *The Graduate School* for supporting the work with a *Dissertation Fieldwork Grant*.

Appendix Slides

Accuracy (post-resolution interpretation)



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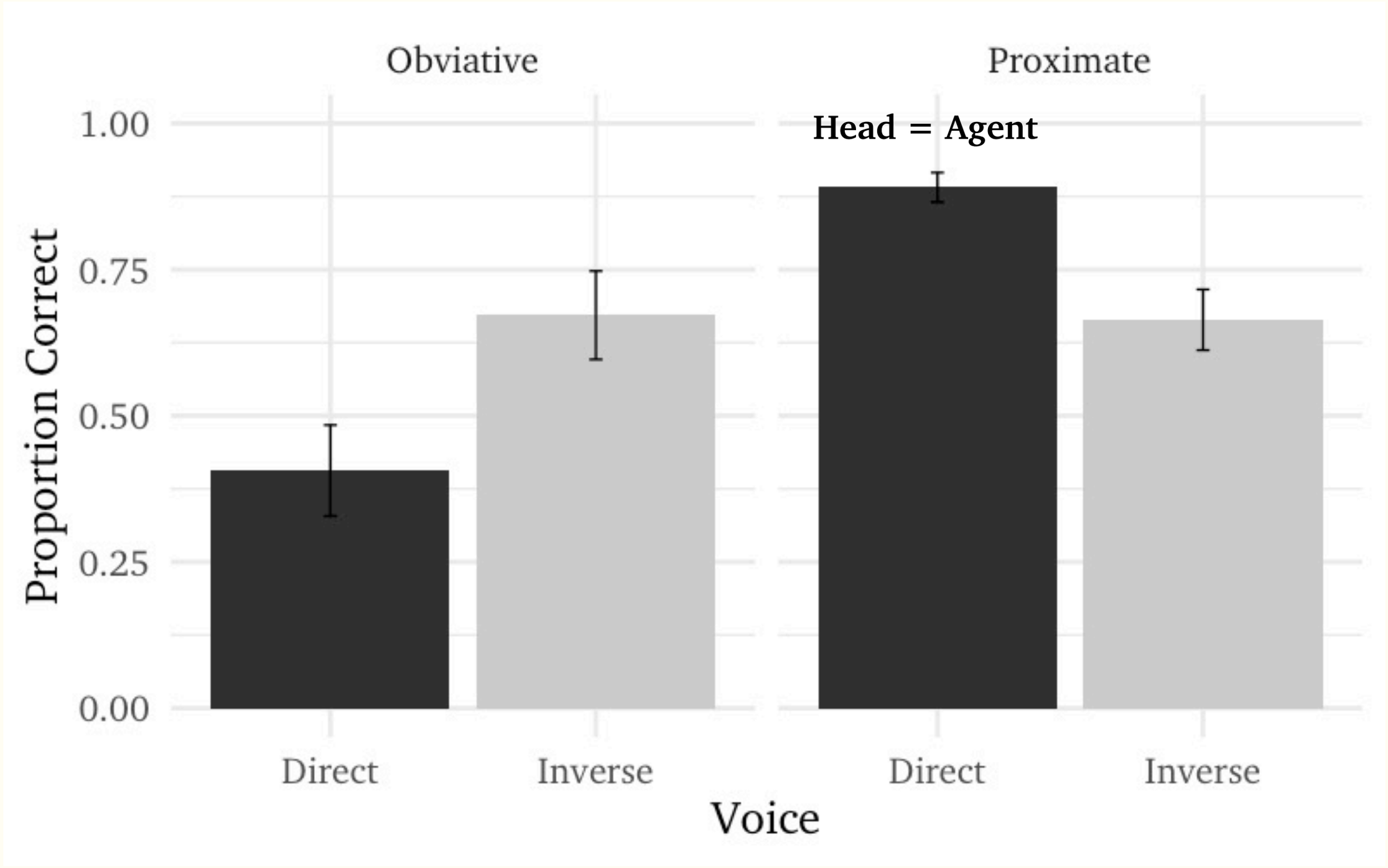

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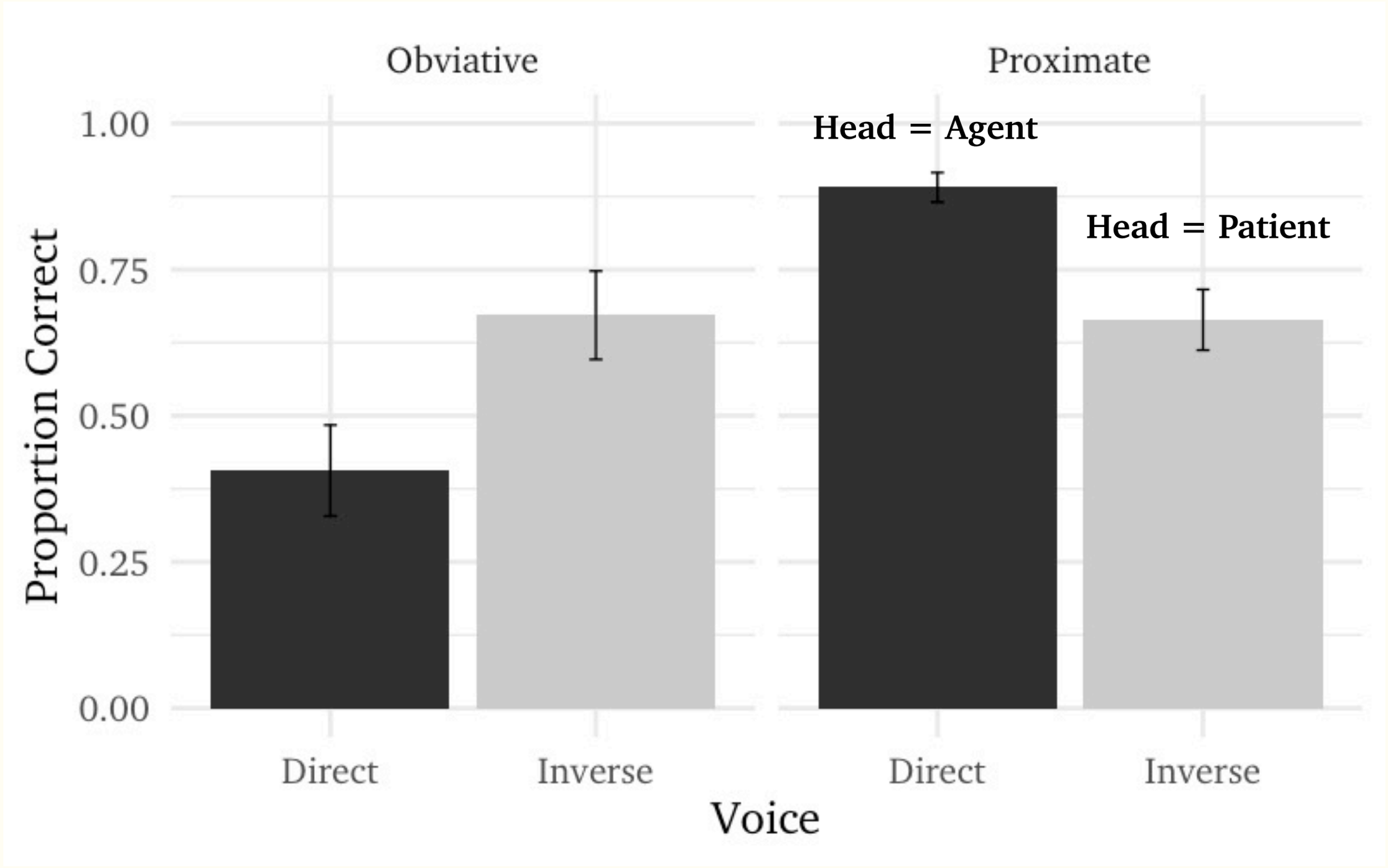

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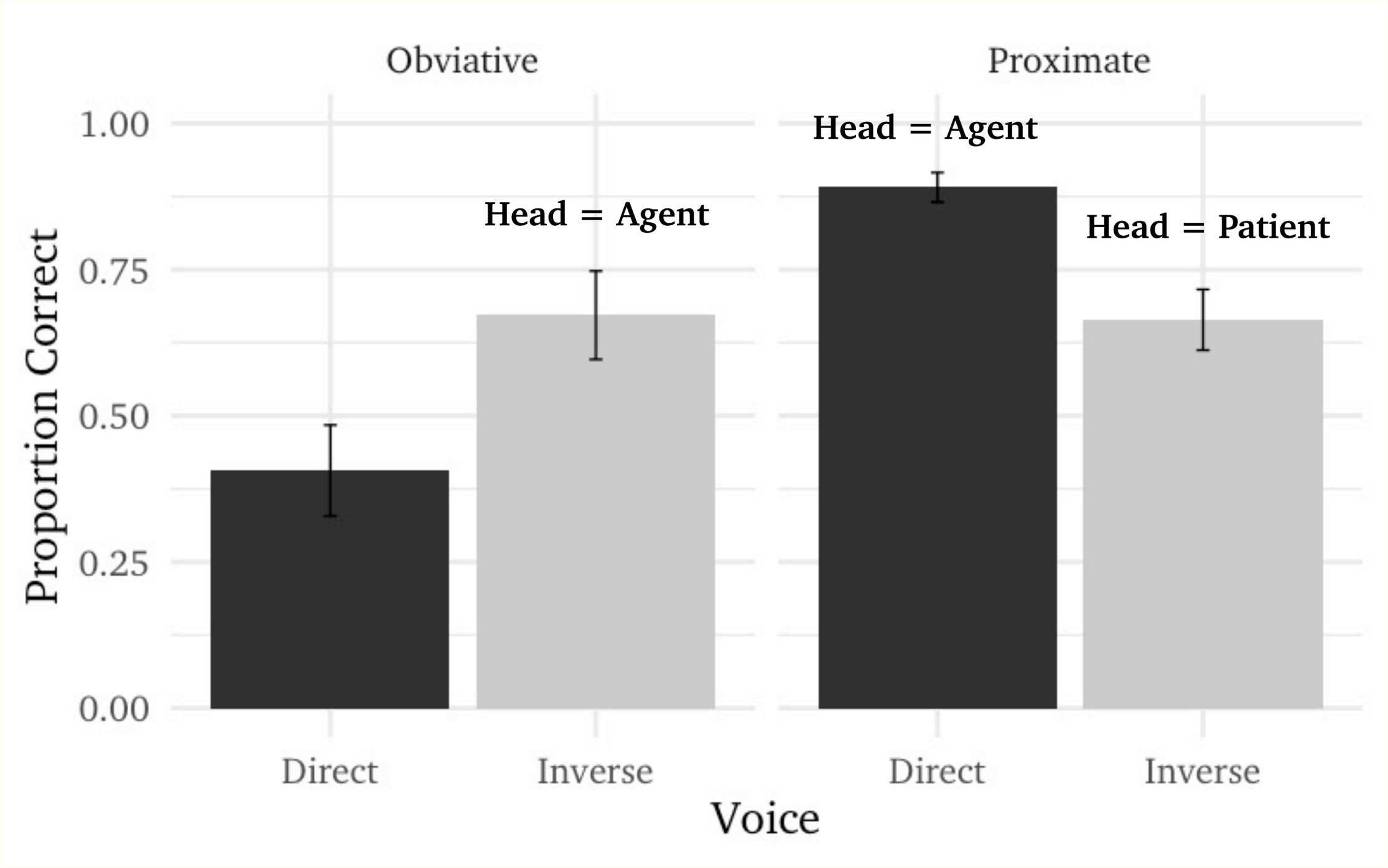

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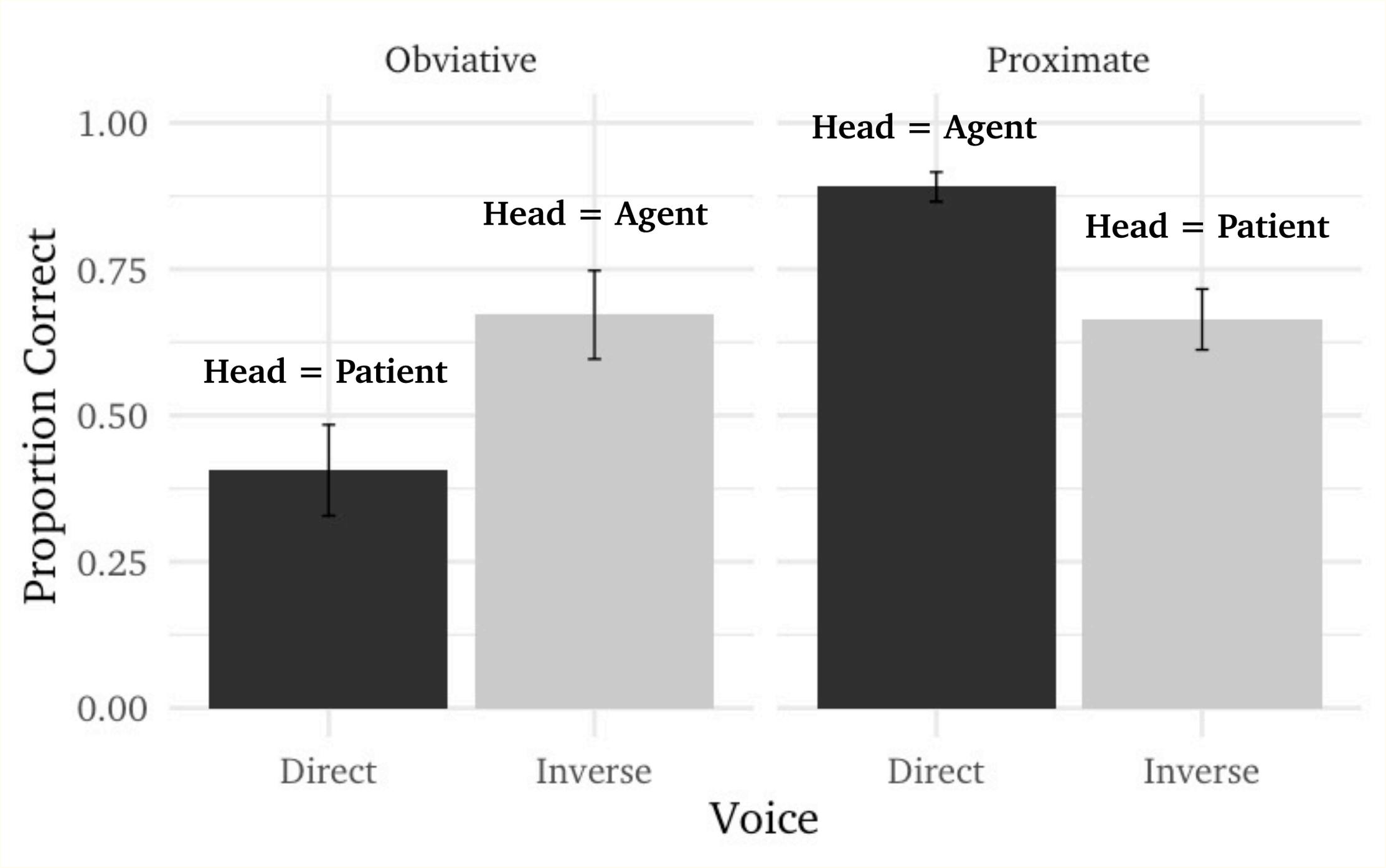

The Technical Proposal

The Revised Active Filler Strategy (Hammerly 2020)

A filler predictively and incrementally extends a comprehender's syntactic representation to include a movement chain such that:

a. The chain terminates in a theta-assigning position
b. Each link *minimizes* syntactic distance (e.g. de Vincenzi 1991)
c. Each link *maximizes* (expected) well-formedness (e.g. Wagers & Pendleton 2016)

Chain Termination

Two possible argument positions in a transitive clause

FILLER … [$_{IP}$ __$_{SUBJ}$ … [$_{vP}$ __$_{EA}$ [$_{√P}$ __$_{IA}$]] **EA = Agent**

FILLER … [$_{IP}$ __$_{SUBJ}$ … [$_{vP}$ __$_{EA}$ [$_{√P}$ __$_{IA}$]] **IA = Patient**

Minimize syntactic distance

The *effect* of interest that follows from distance minimization is the Agent First Preference (the Subject Gap Advantage also follows)

***Agent First Preference*:**

FILLER … [IP ___SUBJ … [vP ___EA [√P ___IA]]

FILLER … [IP ___SUBJ … [vP ___EA [√P ___IA]]

Shorter chains

>

Longer chains

Maximize (incremental) well-formedness

Idea: Incremental predictions are generated based on what syntactic representations are *most likely to be* well-formed given the available (incomplete) information

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I. **(Partial) Person-Animacy Hierarchy:** PROXIMATE > OBVIATIVE

II. **General Syntactic Hierarchy:** HIGH > LOW

   a. *Argument Position*: EA (AGENT) > IA (PATIENT)

Prefer/Require Direct over Inverse!

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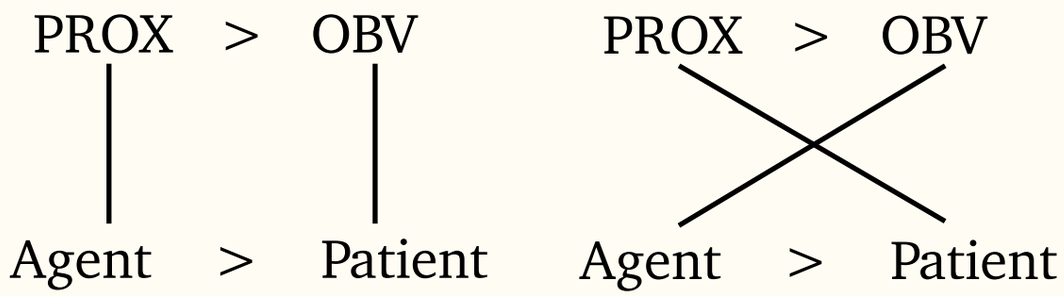
Proximate-Agent Alignment Preference



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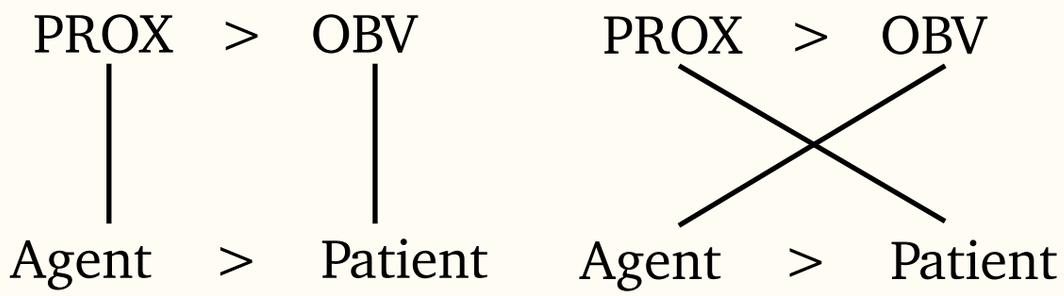
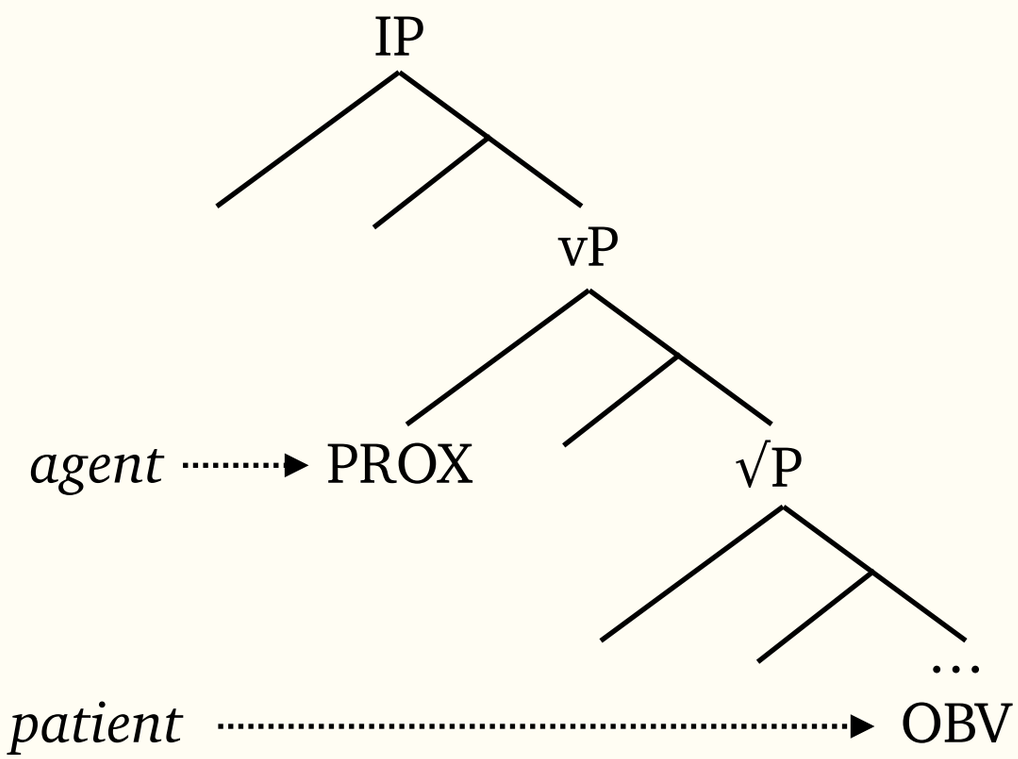


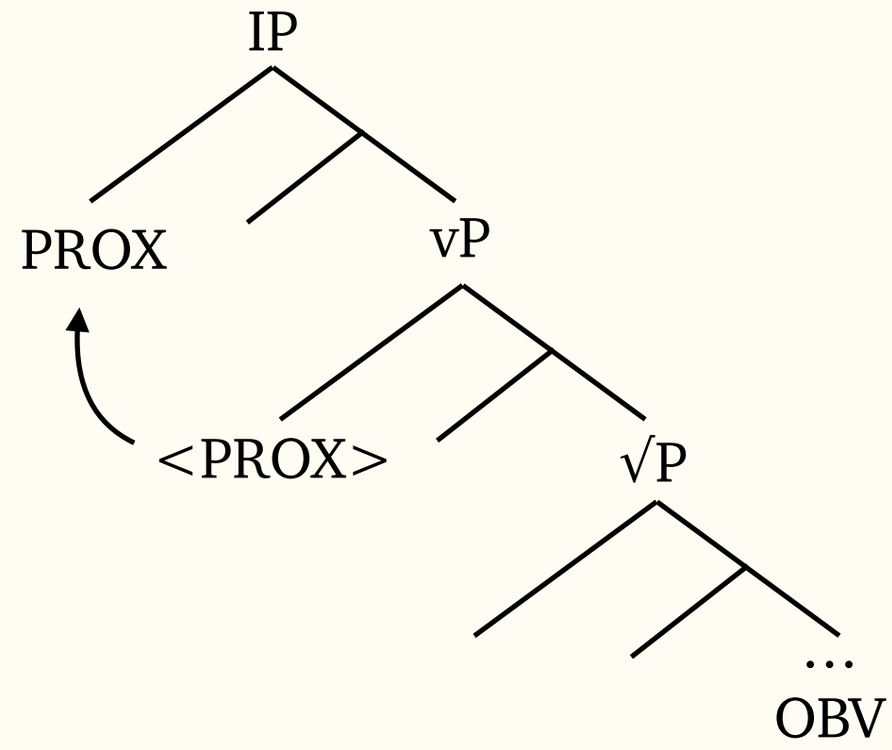
Proximate Agents
>
Obviative Agents

Direct alignments: Syntactic consequences

With "direct" alignments, the proximate <u>agent</u> is promoted to subject position



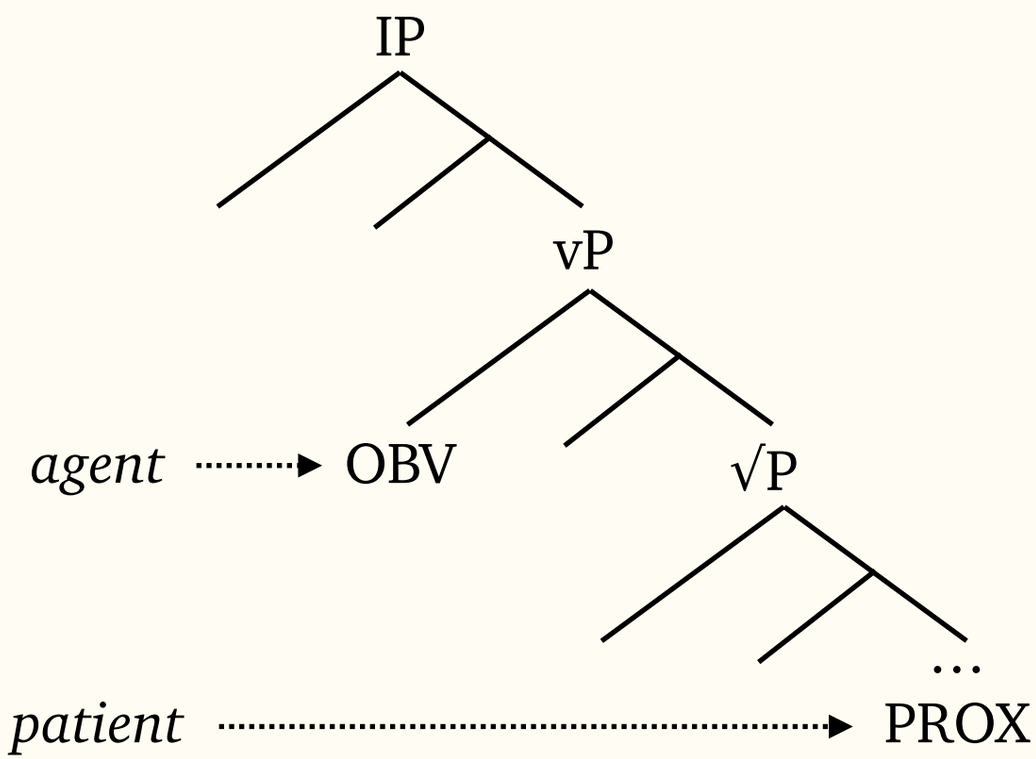
Proximate-Agent Preference <u>obeyed</u>



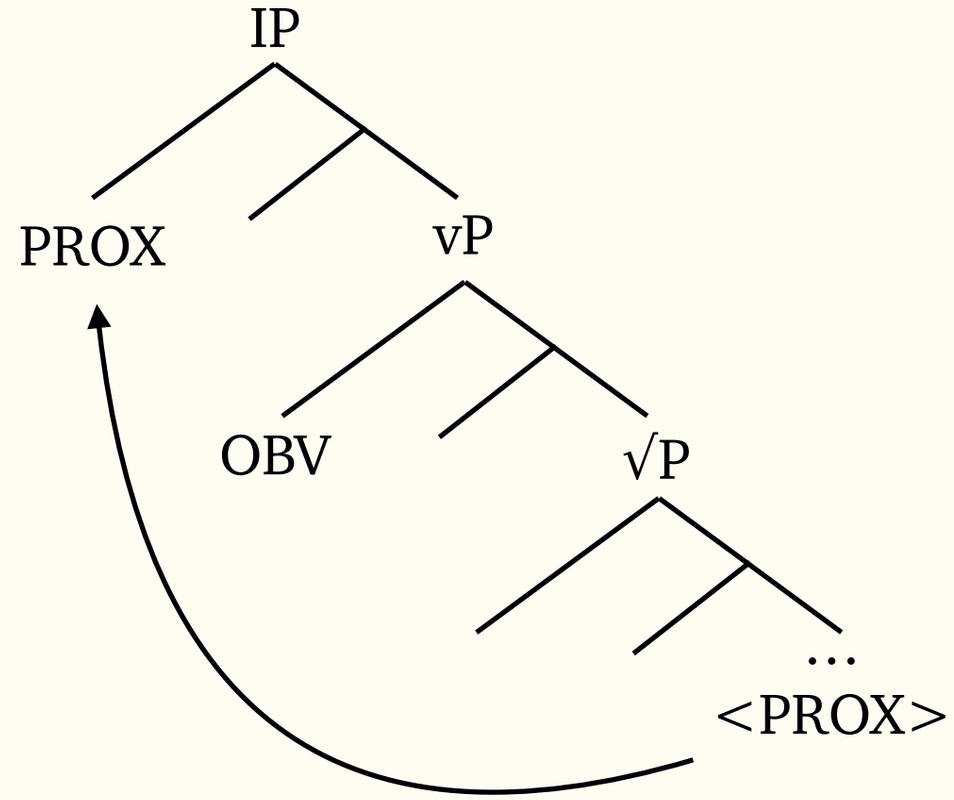
Proximate-Subject Condition <u>obeyed</u>

Inverse alignments: Syntactic consequences

With "inverse" alignments, the proximate <u>patient</u> is promoted to subject position



Proximate-Agent Preference <u>violated</u>



Proximate-Subject Condition <u>obeyed</u>

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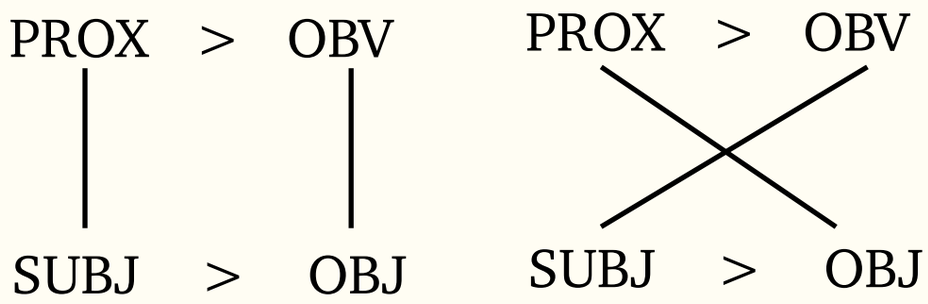

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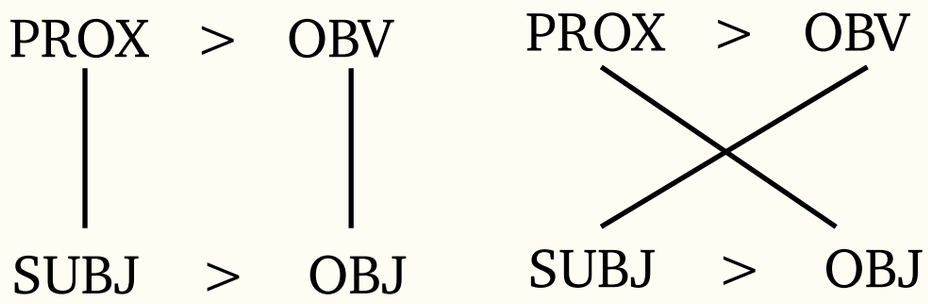

Proximate Subjects

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Obviative Subjects

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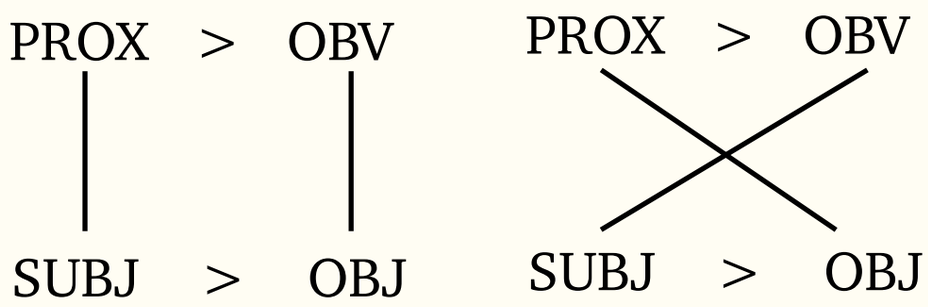
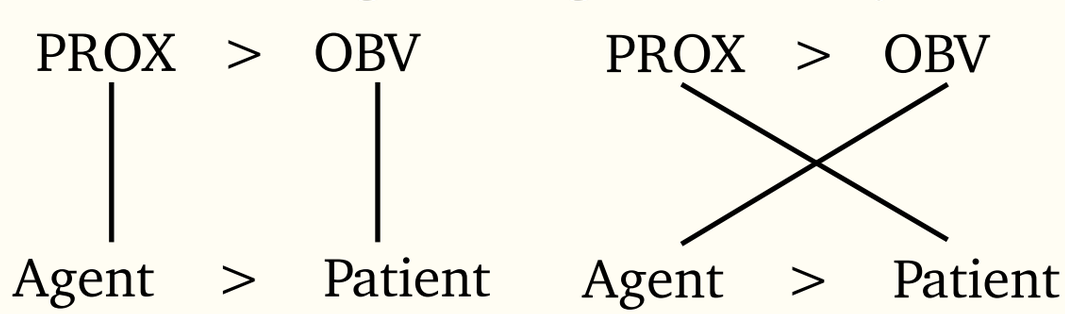


Proximate Subjects
>
Obviative Subjects

Proximate-Agent Alignment Preference



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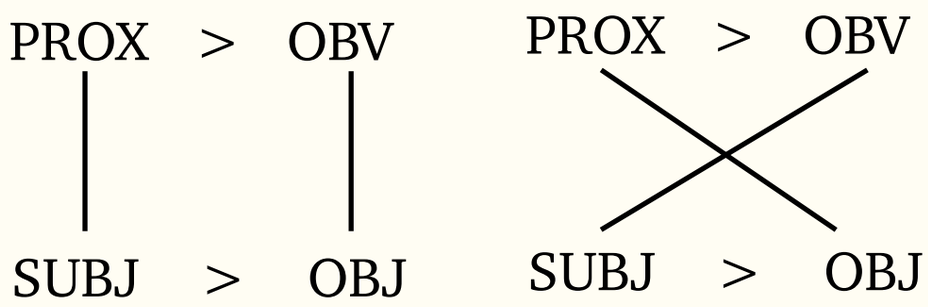

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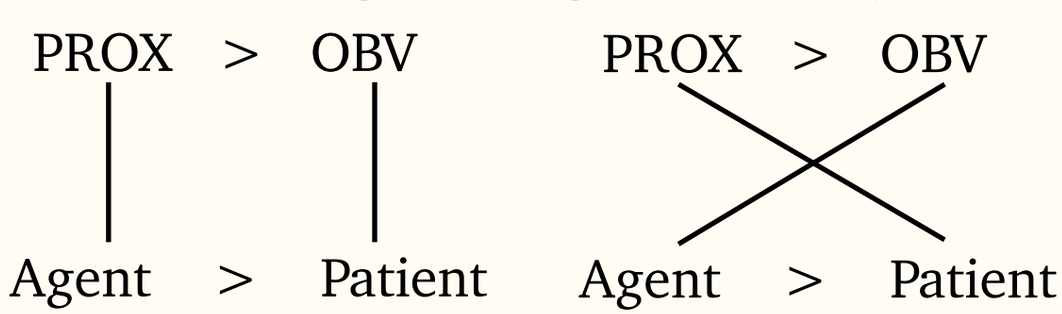
Proximate-Agent Alignment Preference



Proximate Agents
>
Obviative Agents

Returning to the results

Under ambiguity (before Voice):

- Anticipatory looks towards the agent image with proximate heads
  - ➡ Alignment of pressures underlying Agent-First (Filler = EA) and Proximate-Agent (Proximate = EA) Preferences.
- No preference with obviative head nouns
  - ➡ Conflict between pressures underlying Agent-First (Filler = EA) and Proximate-Agent (Obviative = IA) preferences.

Following disambiguation (after Voice):

- More accurate responses with proximate heads
  - ➡ The emergence of the Subject Gap Advantage
- More accurate responses when the head is the agent (regardless of obviation)
  - ➡ The emergence of the Agent-First Preference