

# **Case, word order, and the comprehension of grammatical complexity in Georgian**

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# 1.1 Introduction

What topics interest me?

- Nature of, origin of, and limits on grammatical complexity
- Syntax, morphology, typology, and psycholinguistics
- Georgian (Shanidze 1953, Harris 1981, Aronson 1990)

Methodological & theoretical versatility

- Formal theory, fieldwork, corpus research, experimental methods
- Experimentation is a continuum (Davidson 2020)



# 1.1 Introduction

Santiago Laxopa Zapotec (Oto-Manguean, Mexico)

- Syntax of weak-pronoun movement and animacy (Foley & Toosarvandani 2022)
- Field-psycholinguistics visual-world study on relative-clause processing (Foley et al. 2019)

Singular *they* in North American English

- Cataphora as a lens into socio-psycholinguistic variation (Foley & Ahn submitted)

# **1.2 Today's talk**

Zoom into a complex puzzle in Georgian

- Word order is free, yet case morphology is often an ambiguous cue to grammatical role.

Present novel reading-time evidence (Foley submitted)

- Case-Order Interaction: patient-first is hard to process iff the agent has special case
- Not palpable to speakers! Real-time measures expand the empirical horizon of syntax.

Discuss theoretical perspectives

- **Relativized Minimality** (Rizzi 1990) vs. interacting prominence scales (Bornkessel-Schlesewsky & Schlesewsky 2014)

# Roadmap

1. Introduction

**2. Case & Word Order**

**3. Georgian Case & Word Order**

**4. Comprehending Georgian Case & Word Order**

**5. Theoretical Perspectives**

**6. Conclusion**

# 2.1 Case in English

Distinguishes pronominal subjects & objects in finite clauses

	<u>Subject</u>	<u>Verb</u>	<u>Object</u>	
(1)	<i>The neighbors</i>	<i>stopped</i>	<i>the horses.</i>	<b><u>Transitive</u></b>
(2)	<i>The horses</i>	<i>stopped.</i>		<b><u>Intransitive</u></b>

# 2.1 Case in English

Distinguishes pronominal subjects & objects in finite clauses

- **They** = Intransitive (**S**) or Transitive Subject (**A**) vs. **Them** = Direct Object (**P**).

	<u>Subject</u>	<u>Verb</u>	<u>Object</u>	
(3)	<b>They</b>	stopped	<b>them</b>	<u>Transitive</u>
(4)	<b>They</b>	stopped.		<u>Intransitive</u>

## 2.2 Connecting case and word order

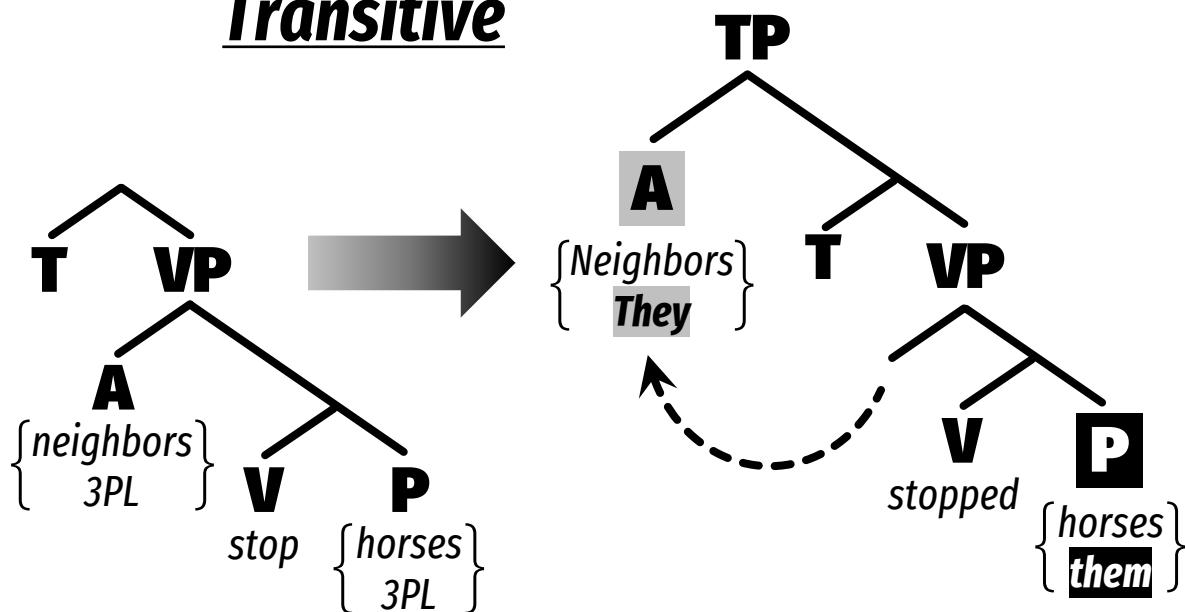
Hypothesis: Case (**they** vs. **them**) is the morphological expression of certain syntactic operations.

<u>Subject</u>	<u>Object</u>		
A	P	<u>Transitive</u>	<b>They</b> stopped <b>them</b> .
S	n/a	<u>Intransitive</u>	<b>They</b> stopped.

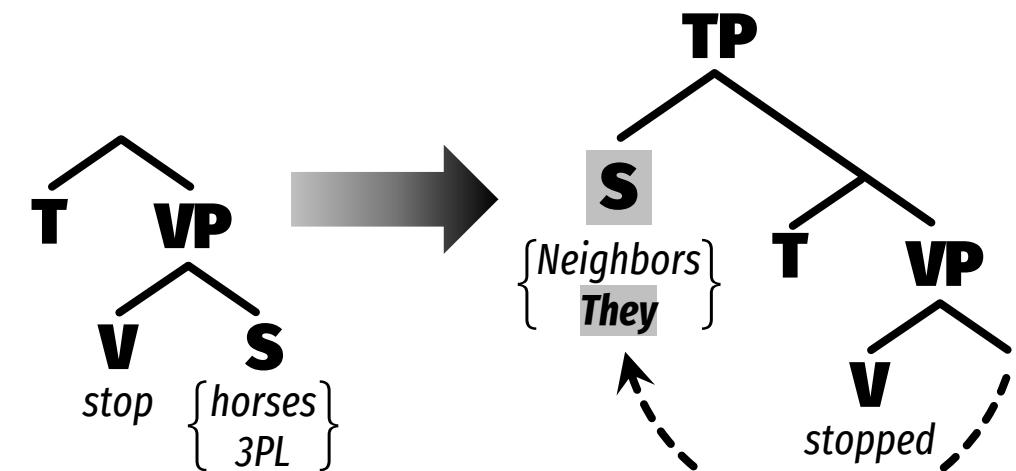
## 2.2 Connecting case and word order

T assigns case and moves the highest NP (Chomsky 1981, 2001), which might be the verb's complement (Perlmutter 1978, et seq.)

### Transitive



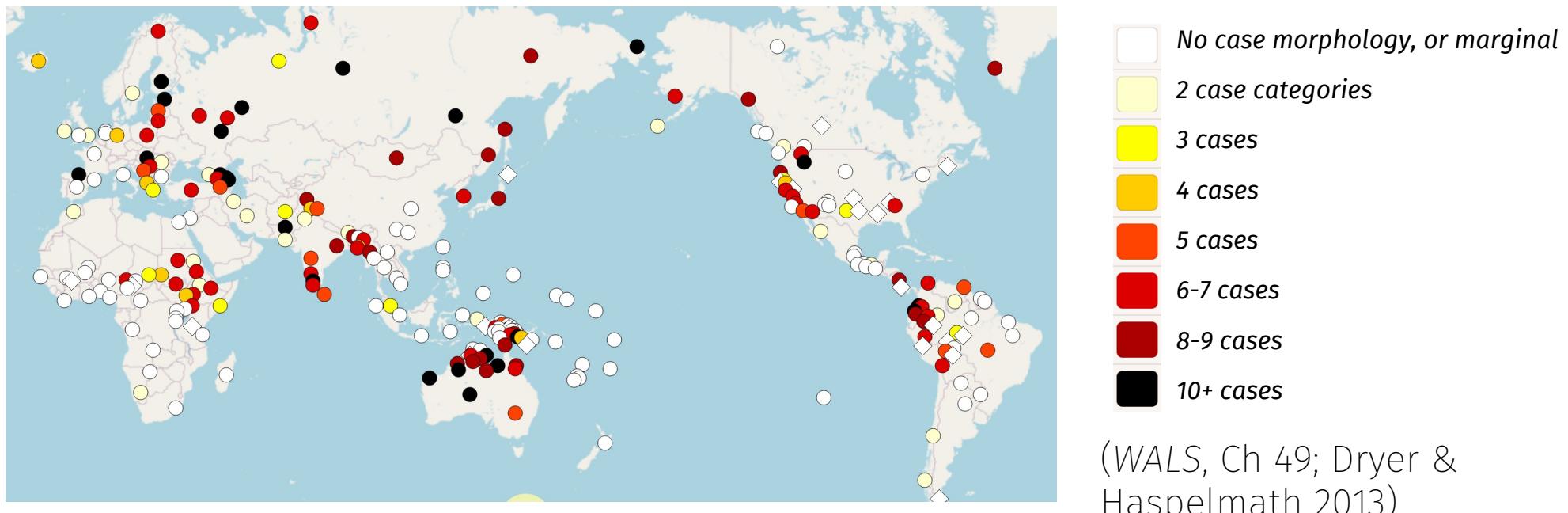
### Intransitive



## 2.3 Why case?

Typology: Many diverse patterns, including none at all

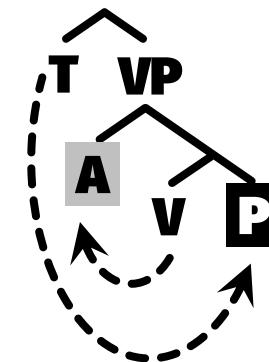
- Rich case is correlated with flexible word order, and with verb finality. (Greenberg 1963)
- Old intuition: Case facilitates efficient communication. (Sapir 1917, Bickel et al. 2015)



## 2.3 Why Case?

Syntactic Theory: The right primitives are hotly debated

- Case is the result of a **feature-exchange operation**  
(Case-as-Agree; Pesetsky & Torrego 2001, Deal to appear)
- Case is the result of **semantic/thematic licensing**  
(Inherent Case; Woolford 2006)
- Case is assigned via phrase-structural **configurations** (Dependent Case; e.g. Marantz 1991, Yip et al. 1987, Baker 2015)



$NP \rightarrow \text{Case-}\alpha / [_{VP} \_\_ \gg NP]$

$NP \rightarrow \text{Case-}\beta / [_{VP} \_\_ ]$

## 2.3 Why Case?

Psycholinguistics: Comprehenders can't help but attend to case

- Case cues affect **real-time measures of sentence processing** – e.g. reading times (Bader & Meng 1999), eye movements (Henry et al. 2017), and neurophysiological responses (Chow et al. 2018)
- Not just L1-adults! Children (Arosio et al. 2012, Janssen et al. 2015), heritage speakers (Polinsky 2011), aphasics (Hanne et al. 2015), L2 learners (Frenck-Mestre et al. 2019).
- Theories are dealing with ever more languages (Bornkessel-Schlesewsky & Schlesewsky 2009), but widening the empirical net is still imperative (Anand et al. 2011).

# Roadmap

- ~~1. Introduction~~
- ~~2. Case & Word Order~~
- 3. Georgian Case & Word Order**
- 4. Comprehending Georgian Case & Word Order**
- 5. Theoretical Perspectives**
- 6. Conclusion**

# 3.1 Why Georgian case?

Split-ergativity conditioned by **tenses** (Harris 1985, Nash 2017)

- (5) *mezobleb-i<sub>NOM</sub>*    *ts<sup>h</sup>xeneb-s<sub>DAT</sub>*    *gaat<sup>h</sup>ereben*  
neighbors-NOM        horses-DAT        stop:TR:FUT:AGR  
“The neighbors will stop the horses”

≈ **They** will stop **them**

- (6) *mezobleb-s<sub>DAT</sub>*    *ts<sup>h</sup>xeneb-i<sub>NOM</sub>*    *gaut<sup>h</sup>erebiat<sup>h</sup>*  
neighbors-DAT        horses-NOM        stop:TR:PERF:AGR  
“The neighbors have stopped the horses”

≈ **Them** have stopped **they**

- (7) *mezobleb-ma<sub>ERG</sub>*    *ts<sup>h</sup>xeneb-i<sub>NOM</sub>*    *gaat<sup>h</sup>eres*  
neighbors-ERG        horses-NOM        stop:TR:AOR:AGR  
“The neighbors stopped the horses”

≈ **Their** have stopped **they**

## 3.1 Why Georgian case?

Seems to be gratuitously complex – even maladaptive?

- Typologically: Classification is controversial (Hewitt 1987, Harris 1990)
- Theoretically: Analysis is challenging (Harris 1981, Marantz 1991, Legate 2008, Nash 2017)
- Psycholinguistically: Comprehension is, somehow, possible (Skopeteas et al. 2011; Foley 2020, submitted; Lau et al. 2022a,b) despite high entropy (Foley 2022)

This is an empirical goldmine!

- Worth investigating from multiple perspectives and with multiple methodologies

## 3.2 Future tense: Nom-A Pattern

Here case patterns like English. Subjects are marked alike.

- (8) *ts<sup>h</sup>xeneb-i<sub>NOM</sub> gat<sup>h</sup>erdebian*  
horses-NOM stop:INTR:FUT:AGR  
“The horses will stop”

- (9) *mezobleb-i<sub>NOM</sub> ts<sup>h</sup>xeneb-s<sub>DAT</sub> gaat<sup>h</sup>ereben*  
neighbors-NOM horses-DAT stop:TR:FUT:AGR  
“The neighbors will stop the horses”

**They** will stop

**They** will stop **them**

**A / S / P** = “Nom-A” Pattern

## 3.2 Perfect tense: Dat-A Pattern

Transitive case functions flip. Non-agents are marked alike.

- (10) *ts<sup>h</sup>xeneb-i<sub>NOM</sub>* *gatf<sup>h</sup>erebulan*  
horses-NOM stop:INTR:PERF:AGR  
“The horses have stopped”

- (11) *mezobleb-s<sub>DAT</sub>* *ts<sup>h</sup>xeneb-i<sub>NOM</sub>* *gautf<sup>h</sup>erebiat<sup>h</sup>*  
neighbors-DAT horses-NOM stop:TR:PERF:AGR  
“The neighbors have stopped the horses”

***They*** have stopped  
***Them*** have stopped ***they***

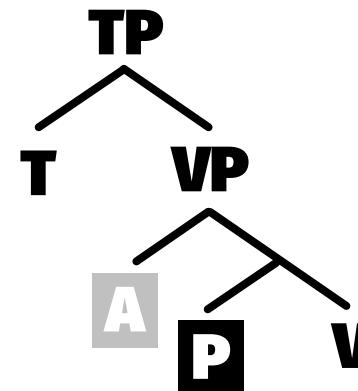
**A / S / P** = “*Dat-A*” Pattern

## 3.2 Perfect tense: Raising to Dative

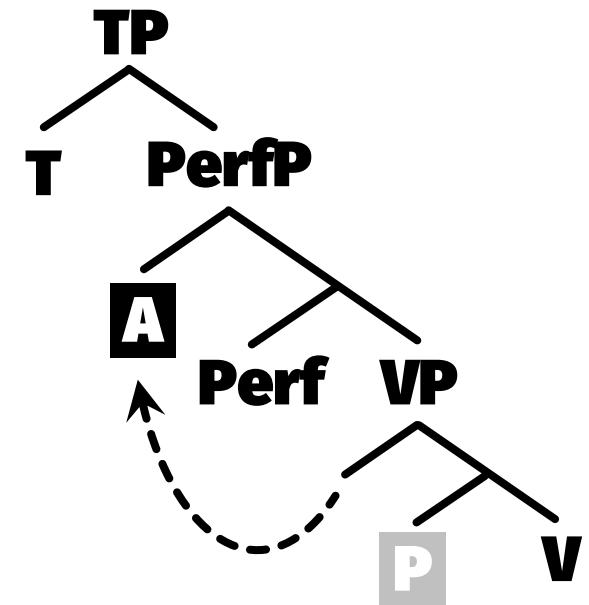
Morphosyntactic evidence points to a **special structure** for Dat-A tenses

- Participle+Aux morphology/ diachrony, “inverted” agreement, no indirect objects (Harris 1981, 1985)
- Complex predicate analysis: **A raises** to get dative case (Marantz 1987, Lomashvili & Harley 2011, Bondarenko & Zompi to appear)

Nom-A tenses:  
Ordinary syntax



Dat-A tenses:  
Complex syntax w/ raising



### 3.3 Georgian word order is flexible

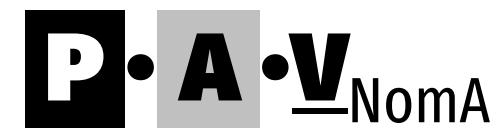
Overt NP arguments often scramble (Skopeteas et al. 2009)

- Despite structural differences, Nom-A and Dat-A clauses have identical word order patterns. Speakers report no differences, and the literature notes none (Vogt 1971).

(12)	<i>mezobleb-i</i> <sub>NOM</sub>	<i>ts'xeneb-s</i> <sub>DAT</sub>	<u><i>gaatf'reben</i></u>	<u><i>stop:TR:FUT:AGR</i></u>
	neighbors-NOM	horses-DAT		
“The neighbors will stop the horses”				



(13)	<i>ts'xeneb-s</i> <sub>DAT</sub>	<i>mezobleb-i</i> <sub>NOM</sub>	<u><i>gaatf'reben</i></u>	<u><i>stop:TR:FUT:AGR</i></u>
	horses-DAT	neighbors-NOM		
“The neighbors will stop the horses”				



### 3.3 Georgian word order is flexible

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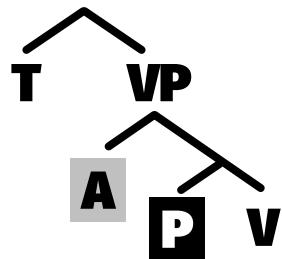
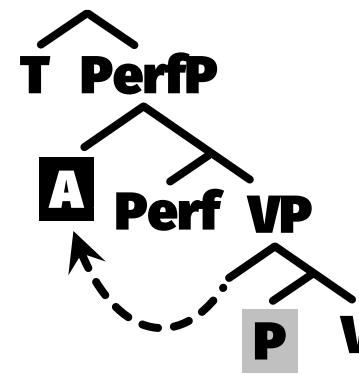
(12)	<i>mezobleb-s<sub>DAT</sub></i>	<i>ts<sup>h</sup>xeneb-i<sub>NOM</sub></i>	<i><u>gautʃerebiat<sup>h</sup></u></i>	<b>A • P • V</b>	<sub>DatA</sub>
neighbors-DAT        horses-NOM <u>stop:TR:PERF:AGR</u>					

“The neighbors have stopped the horses”

(13)	<i>ts<sup>h</sup>xeneb-i<sub>NOM</sub></i>	<i>mezobleb-s<sub>DAT</sub></i>	<i><u>gautʃerebiat<sup>h</sup></u></i>	<b>P • A • V</b>	<sub>DatA</sub>
horses-NOM        neighbors-DAT <u>stop:TR:PERF:AGR</u>					

“The neighbors have stopped the horses”

# 3.4 Summary of key facts

<u>Tense</u>	<u>Word Order</u>	<u>Case Pattern</u>	<u>Pseudo-English</u>	<u>Structure</u>
Future	Free	<b>Nom-A</b> <b>A / S / P</b>	<i>They'll stop</i> <i>They'll stop them</i>	 <pre> graph TD     T --- VP     VP --- A     VP --- P     A --- V     P --- V   </pre>
Perfect	Free	<b>Dat-A</b> <b>A / S / P</b>	<i>They've stopped</i> <i>Them've stopped they</i>	 <pre> graph TD     T --- PerfP     PerfP --- A     PerfP --- Perf     Perf --- VP     VP --- V     VP --- P   </pre>

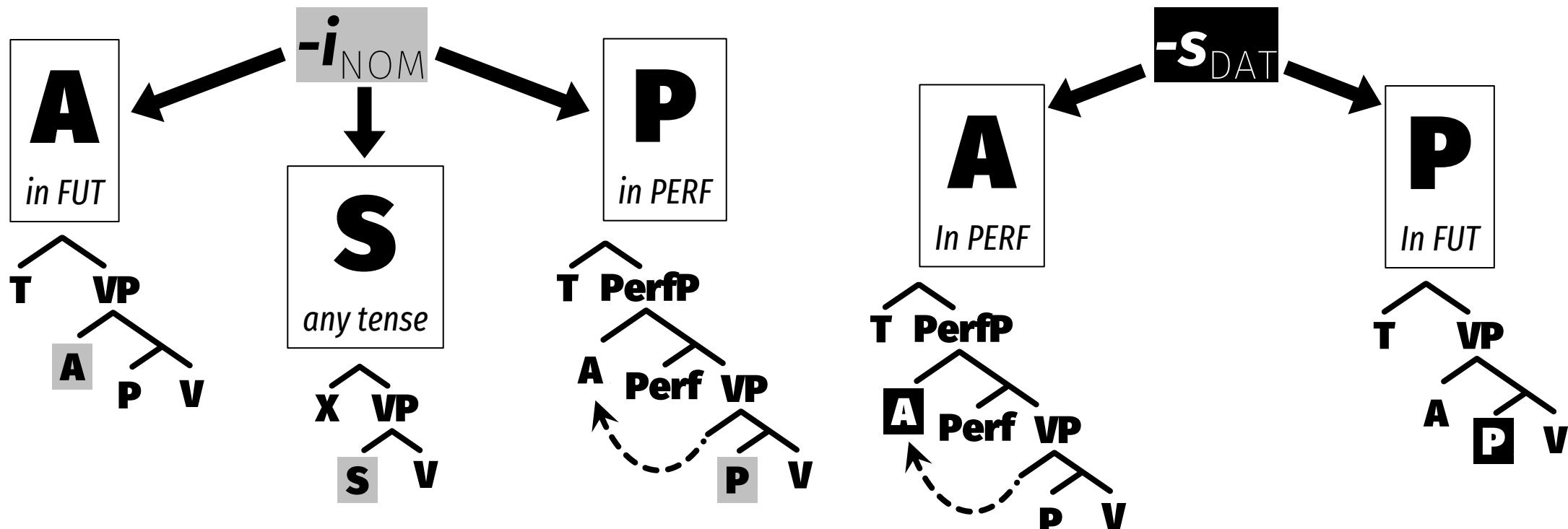
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# 4.1 The comprehension puzzle

Incremental case–role ambiguities are pervasive in Georgian.

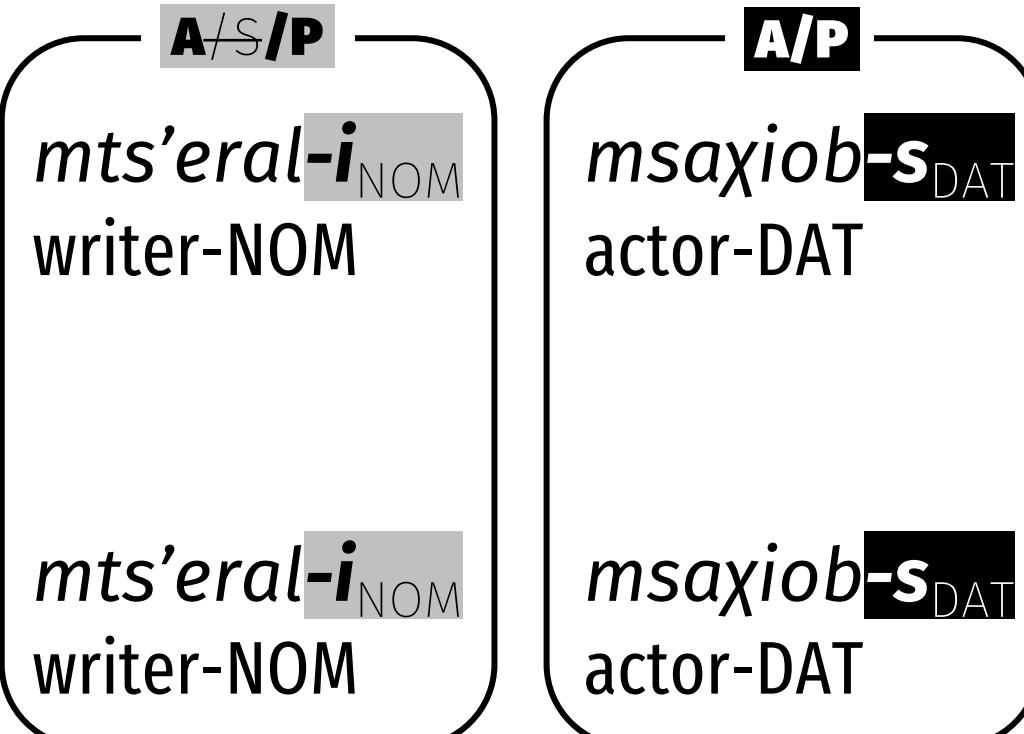
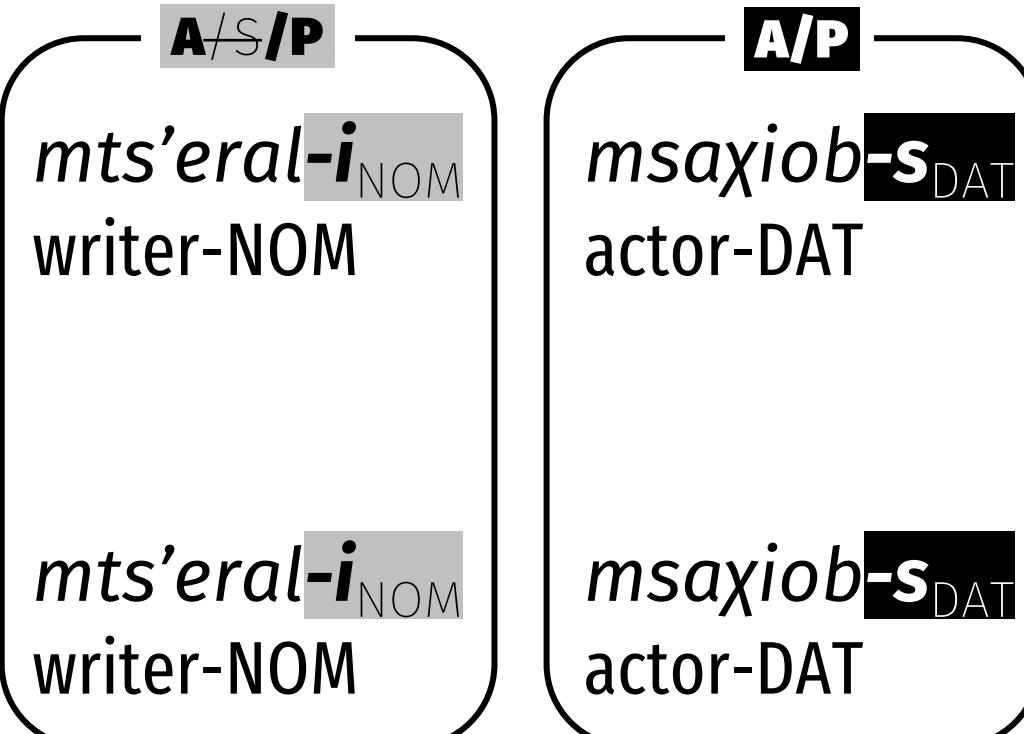
- The crucial disambiguator is verbal morphology, indicating tense/transitivity.



## 4.2 Processing word by word

- (14) **A/S/P**  
*mts'eral-i*<sub>NOM</sub>  
writer-NOM
- (15) *mts'eral-i*<sub>NOM</sub>  
writer-NOM

## 4.2 Processing word by word

- (14)   
**A/S/P** *mts'eral-i<sub>NOM</sub>*  
writer-NOM
- A/P** *msaxiob-s<sub>DAT</sub>*  
actor-DAT
- (15)   
**A/S/P** *mts'eral-i<sub>NOM</sub>*  
writer-NOM
- A/P** *msaxiob-s<sub>DAT</sub>*  
actor-DAT

## 4.2 Processing word by word



“The writer will see the actor”



“The actor has seen the writer”

## 4.2 Processing word by word

- (14) **A/S/P** *mts'eral-i*<sub>NOM</sub>  
writer-NOM
- A/P** *msaxiob-s*<sub>DAT</sub>  
actor-DAT
- NomA → A·P·V** *naxavs*  
see:TR:**FUT**:AGR
- “The writer will see the actor”

## 4.2 Processing word by word

- (15)   
“The actor has seen the writer”
- A/S/**P**
- mts'eral-i*<sub>NOM</sub>  
writer-NOM
- A/P**
- msaxiob-s*<sub>DAT</sub>  
actor-DAT
- Data → P·A·V
- unaxavs*  
see:TR:**PERF**:AGR

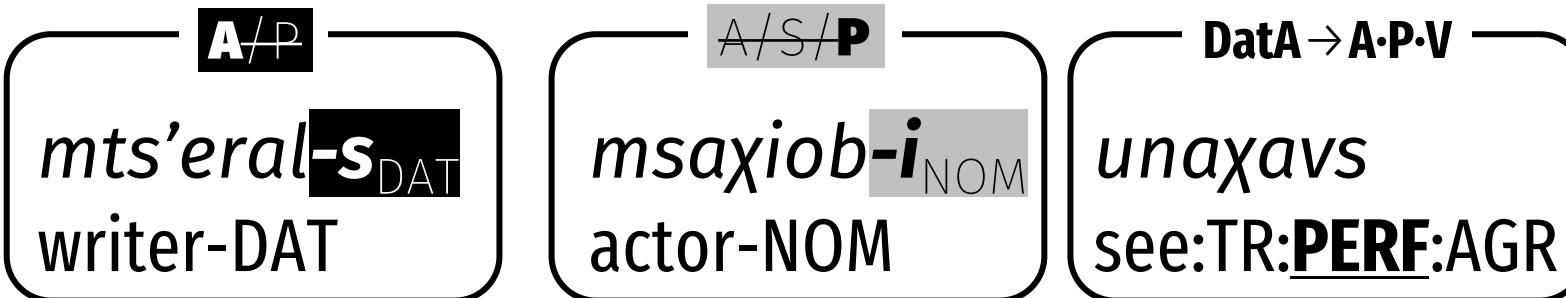
## 4.2 Processing word by word

- (16) **A/P**  
*mts'eral-s*<sub>DAT</sub>  
writer-DAT
- (17) *mts'eral-s*<sub>DAT</sub>  
writer-DAT

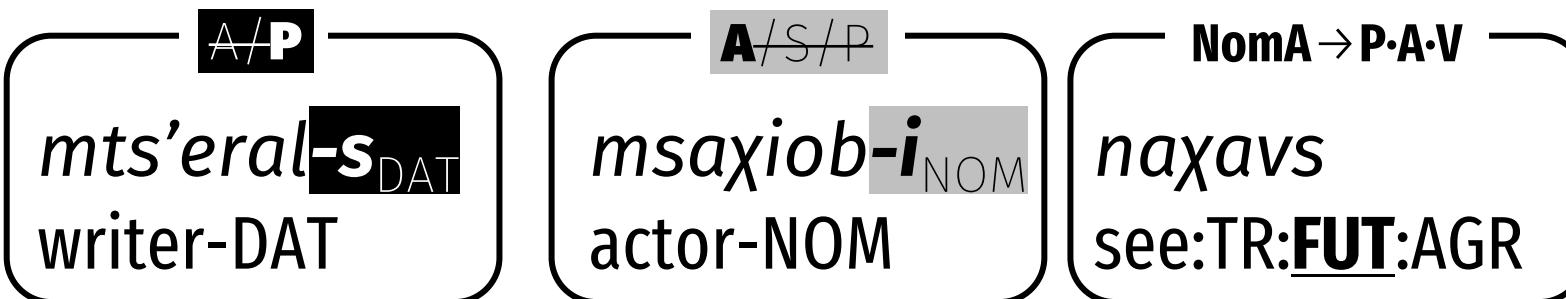
## 4.2 Processing word by word

- (16) **A/P** *mts'eral-s*<sub>DAT</sub>  
writer-DAT
- (17) **A/S/P** *msaxiob-i*<sub>NOM</sub>  
actor-NOM

## 4.2 Processing word by word

- (16)   
A/P      A/S/P      Data → A·P·V  
*mts'eral-s*<sub>DAT</sub>  
writer-DAT    *msaxiob-i*<sub>NOM</sub>  
actor-NOM    *unaxavs*  
see:TR:**PERF**:AGR

“The writer has seen the actor”

- (17)   
A/P      A/S/P      NomA → P·A·V  
*mts'eral-s*<sub>DAT</sub>  
writer-DAT    *msaxiob-i*<sub>NOM</sub>  
actor-NOM    *naxavs*  
see:TR:**FUT**:AGR

“The actor will see the writer”

# 4.3 Description of experiment

## Guiding empirical questions

- Upon observing combinations of **role-ambiguous** nouns in **-i<sub>NOM</sub>** and **-s<sub>DAT</sub>**...
- ...what types of **disambiguations** (i.e. verbal cues) are **easiest** to process, and **why?**

## Methods, materials, participants

- **L-Maze** (Freedman & Forster 1985, Boyce et al. 2020); conducted over two sessions on the **internet** via **PClubex** (Zehr & Schwarz 2018); 56 native speakers in Georgia
- **2×2 design**: Order (**A•P•V, P•A•V**) × Case (**Nom-A, Dat-A**); 16+16 itemsets
- What's presented here are subparts of a larger, more complex study (Foley submitted)

## 4.4 Lexicality Maze (L-Maze)

Hybrid of self-paced reading and lexical decision task

***English Mock-Up***

Choose the real word

Lions  
[e]

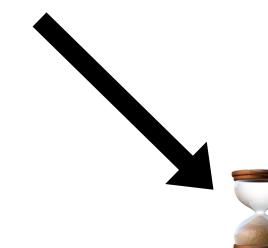
Blyeb  
[i]



***Georgian Mock-Up***

სცადეთ სწორი ნიტყვა

ღომმა  
[e]                   ჭრუოტ  
                         [i]



## 4.4 Lexicality Maze (L-Maze)

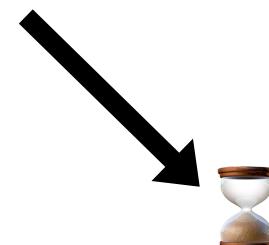
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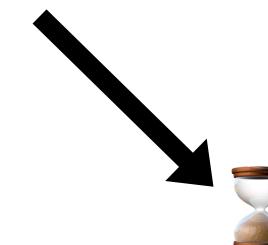


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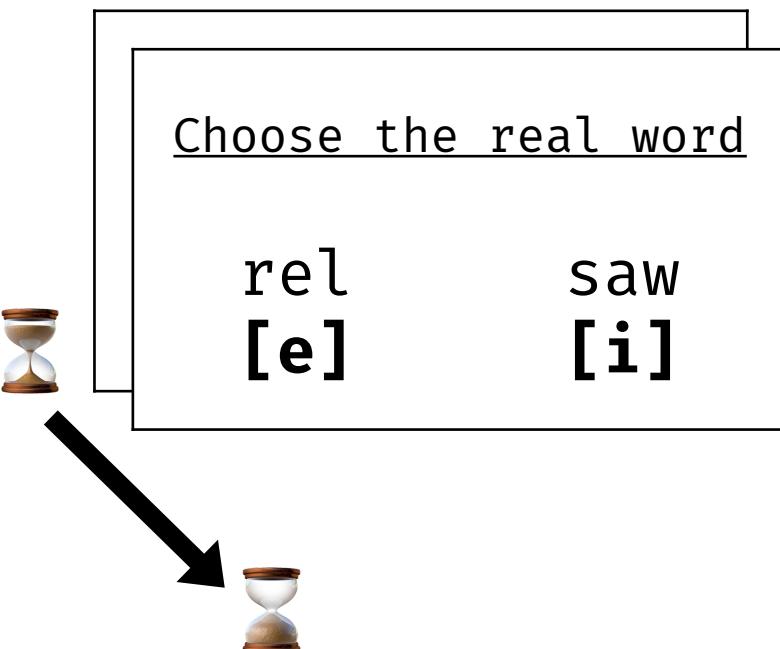
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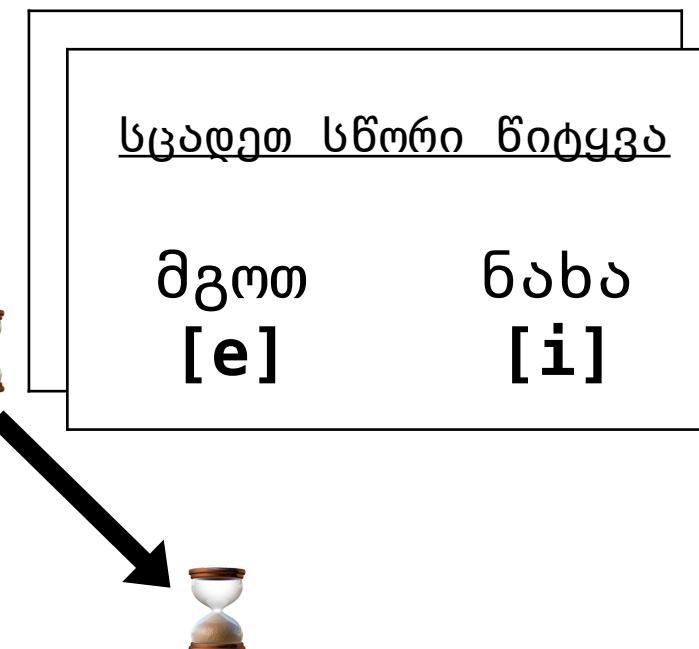
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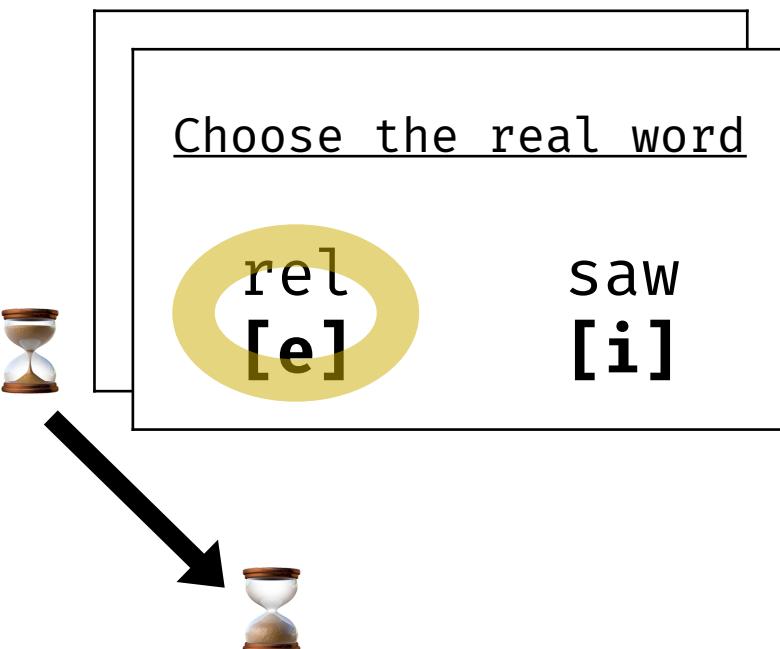
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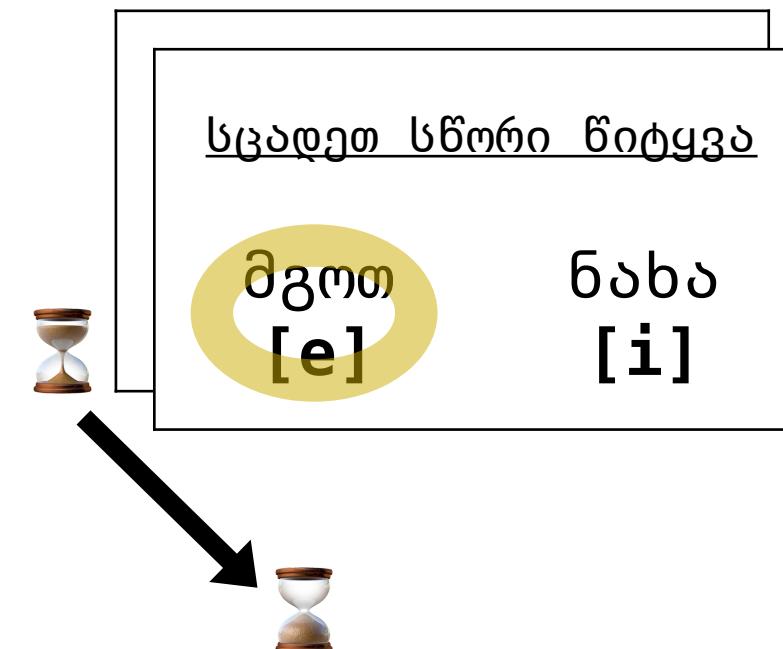
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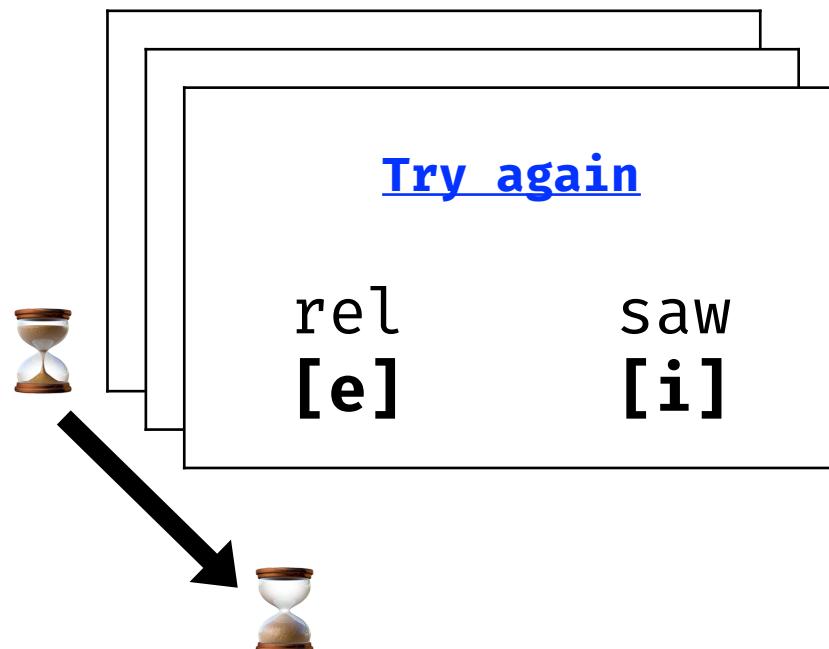
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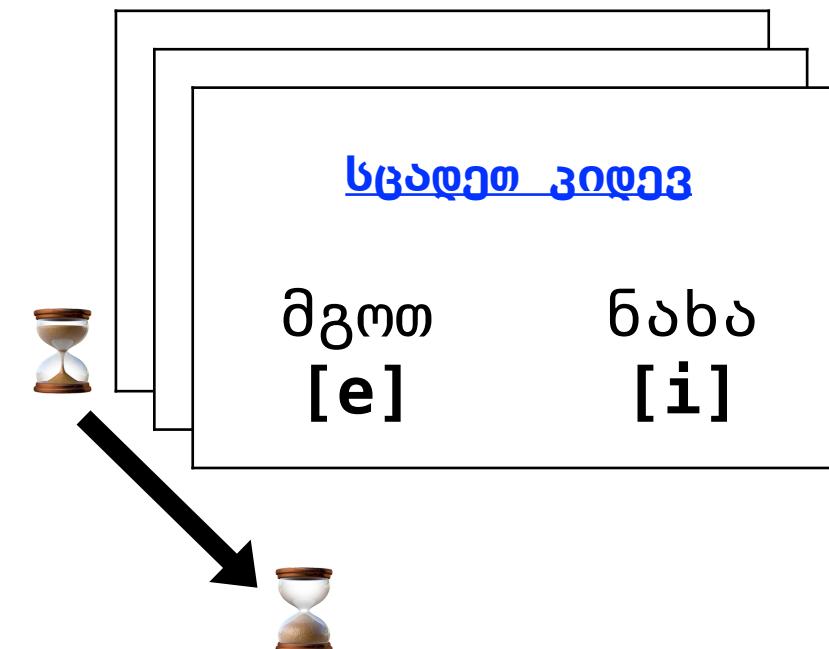
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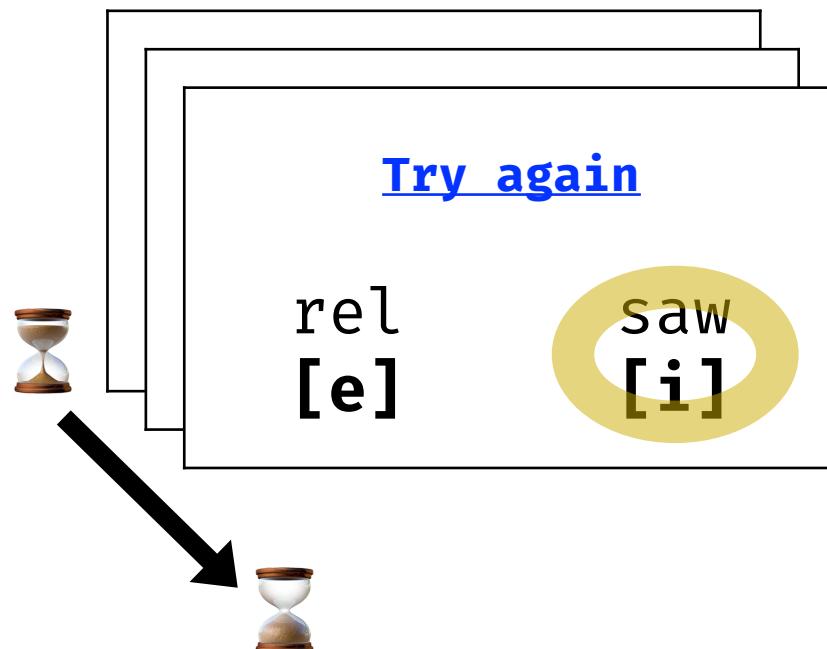
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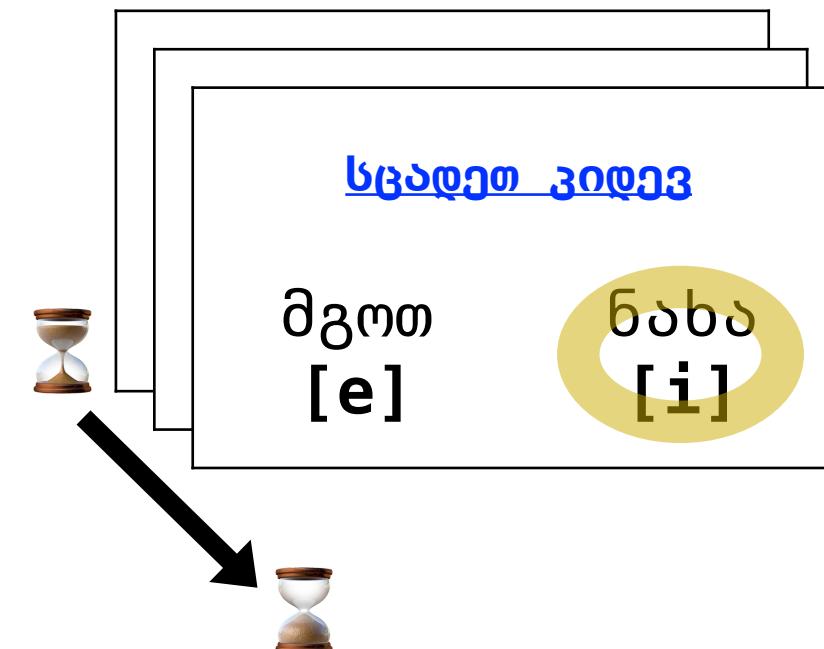
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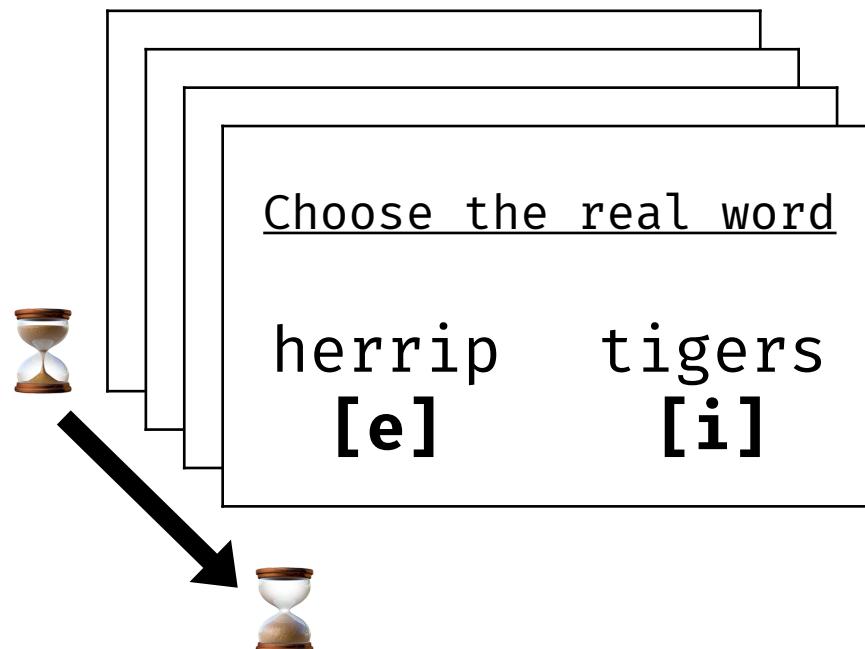
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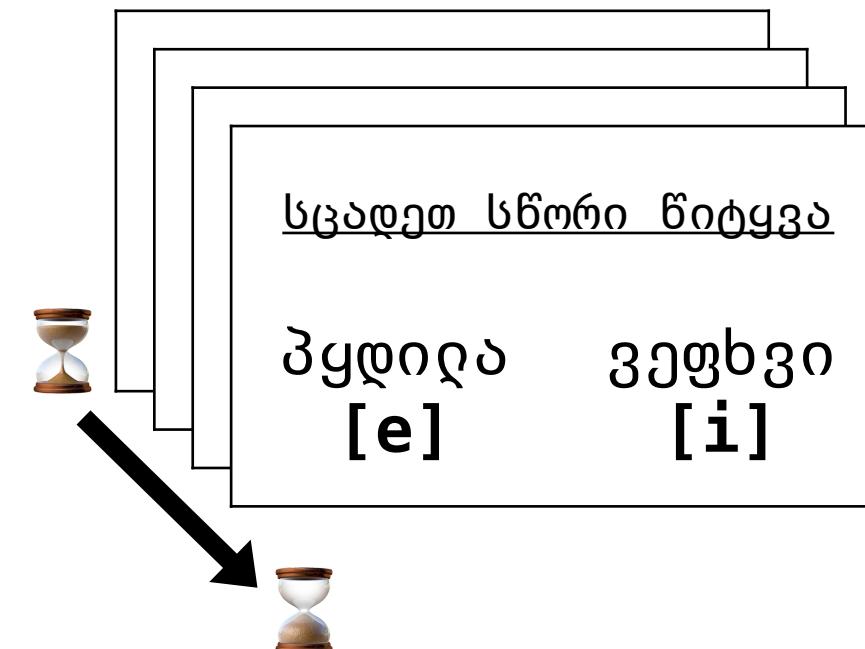
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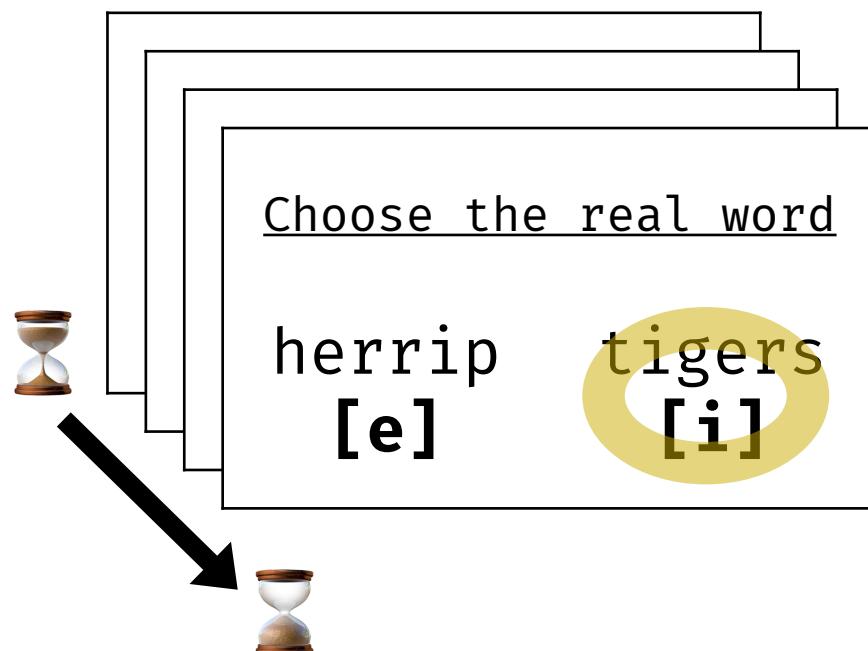
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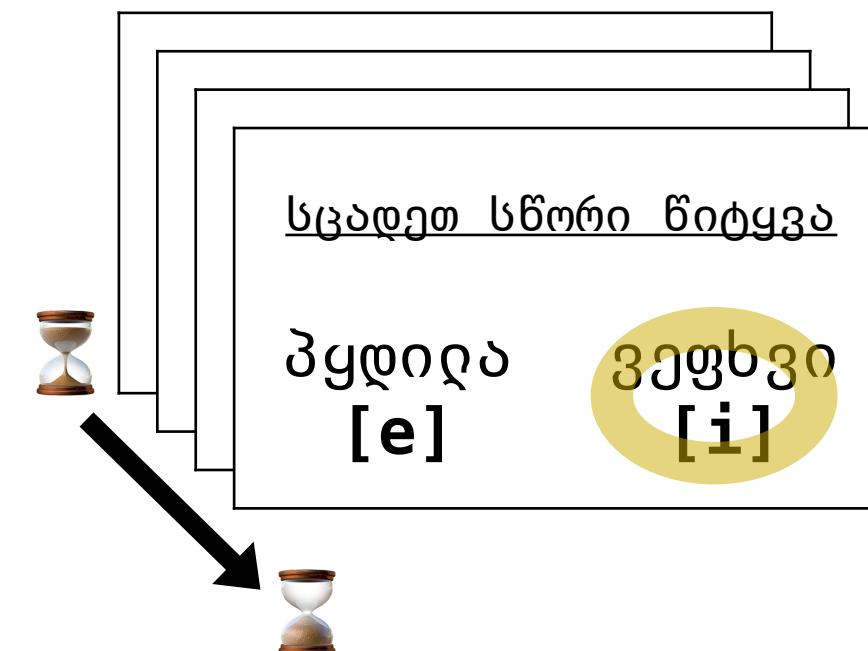
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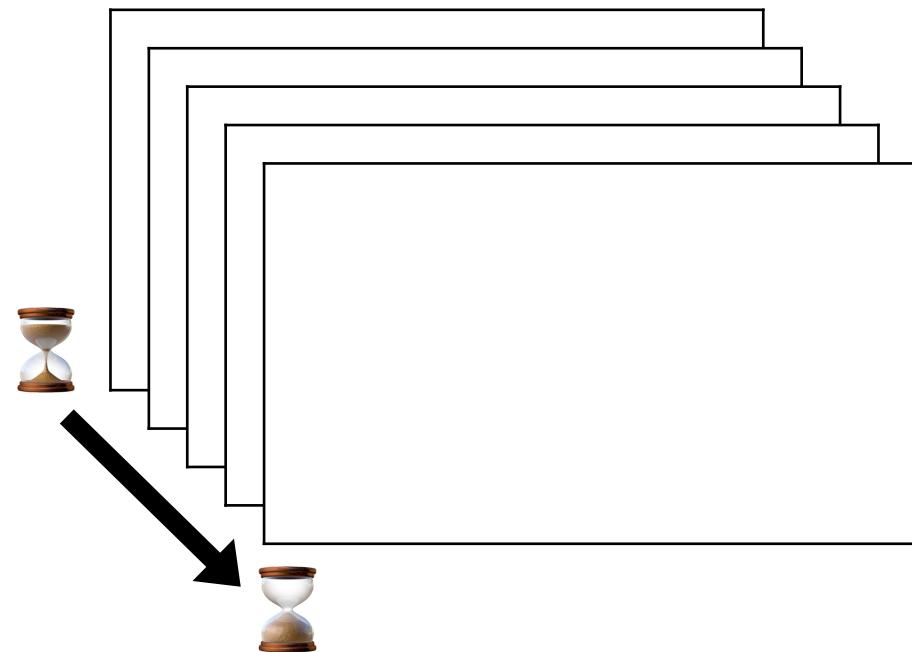
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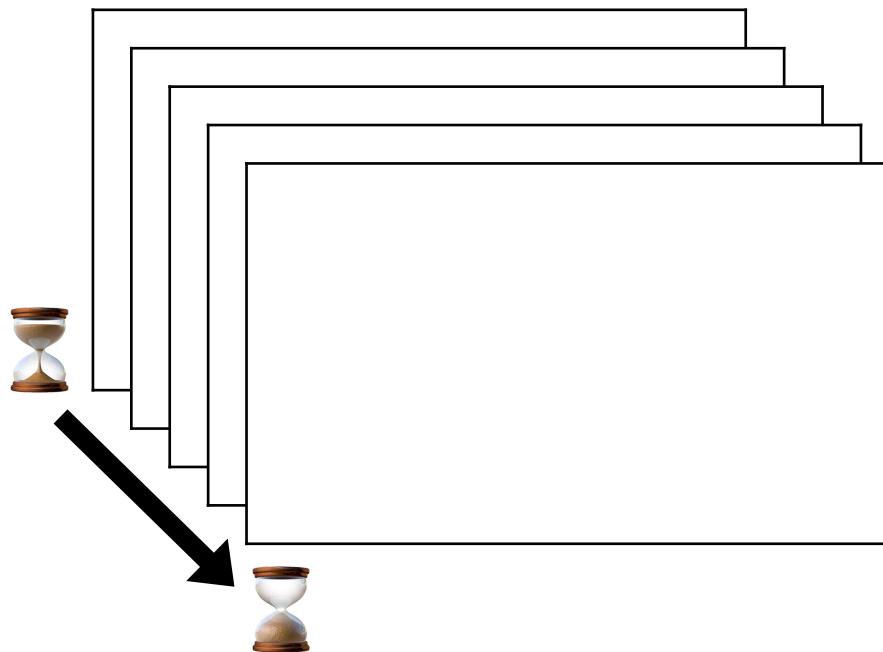
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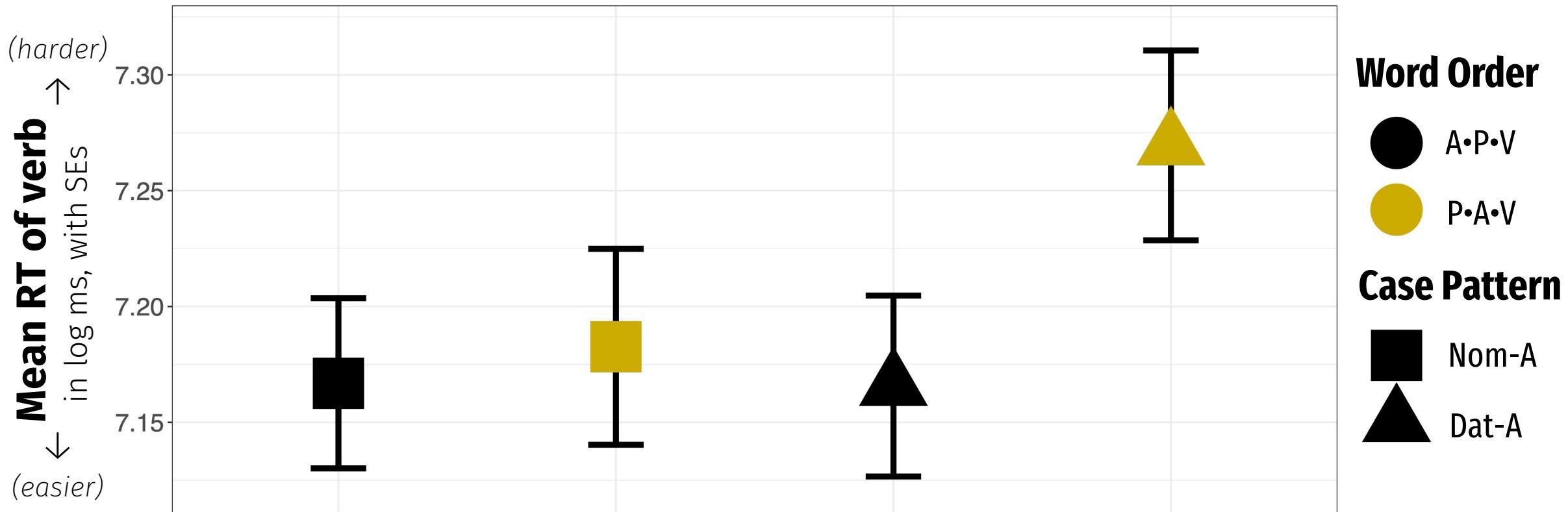
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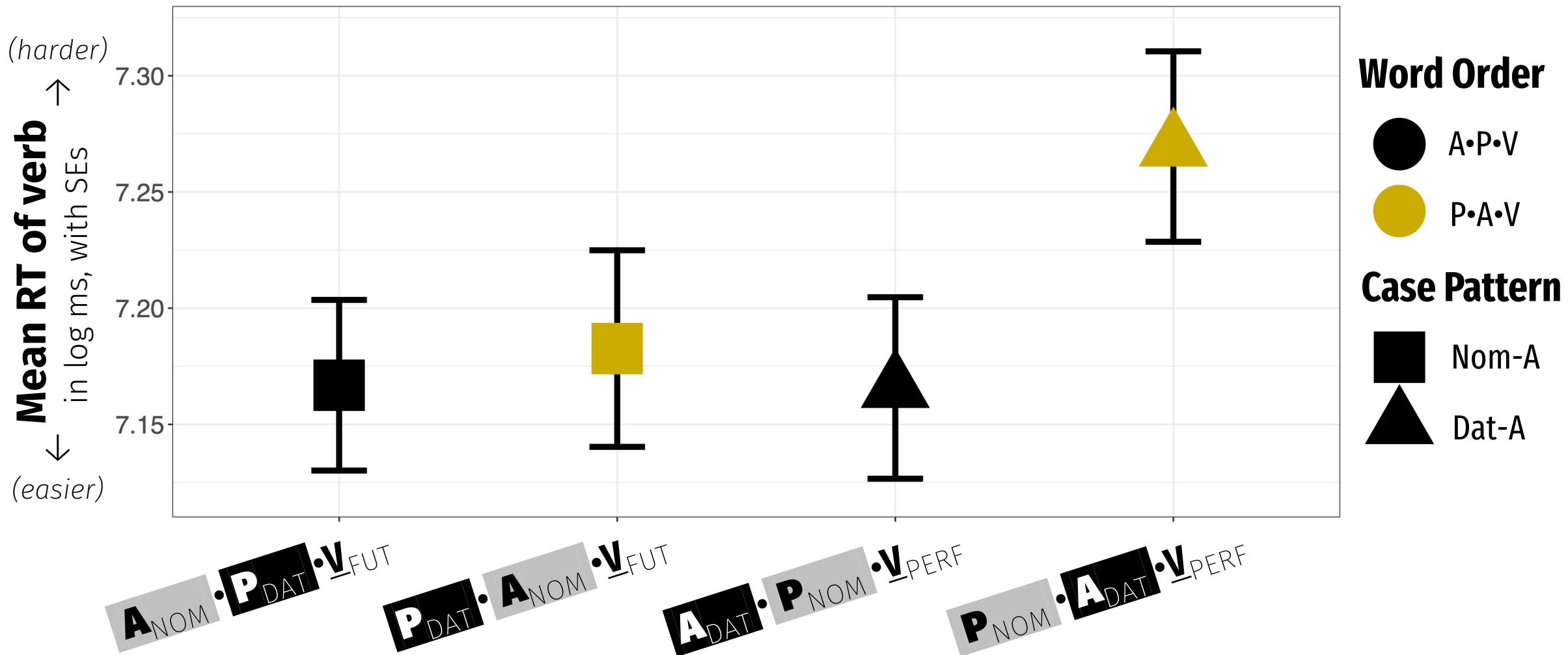
**Georgian Mock-Up**



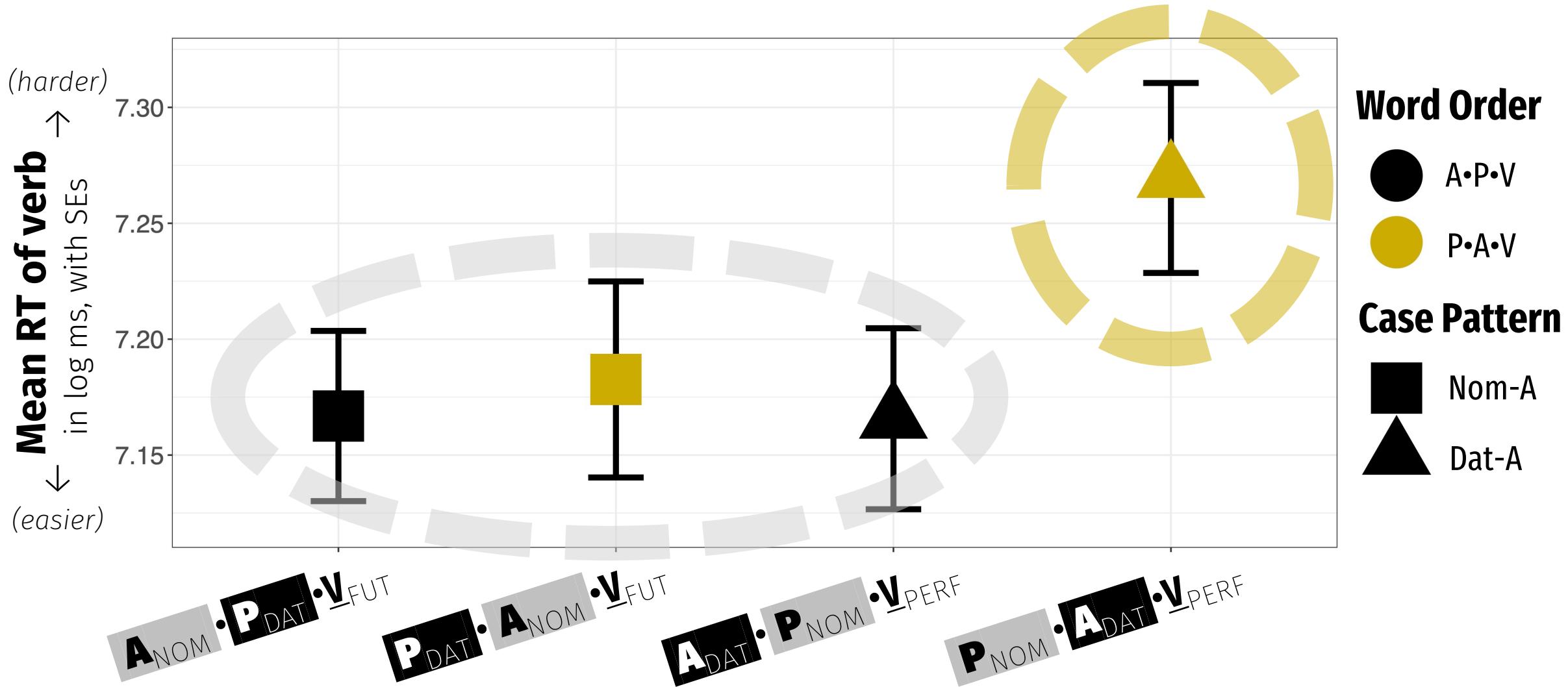
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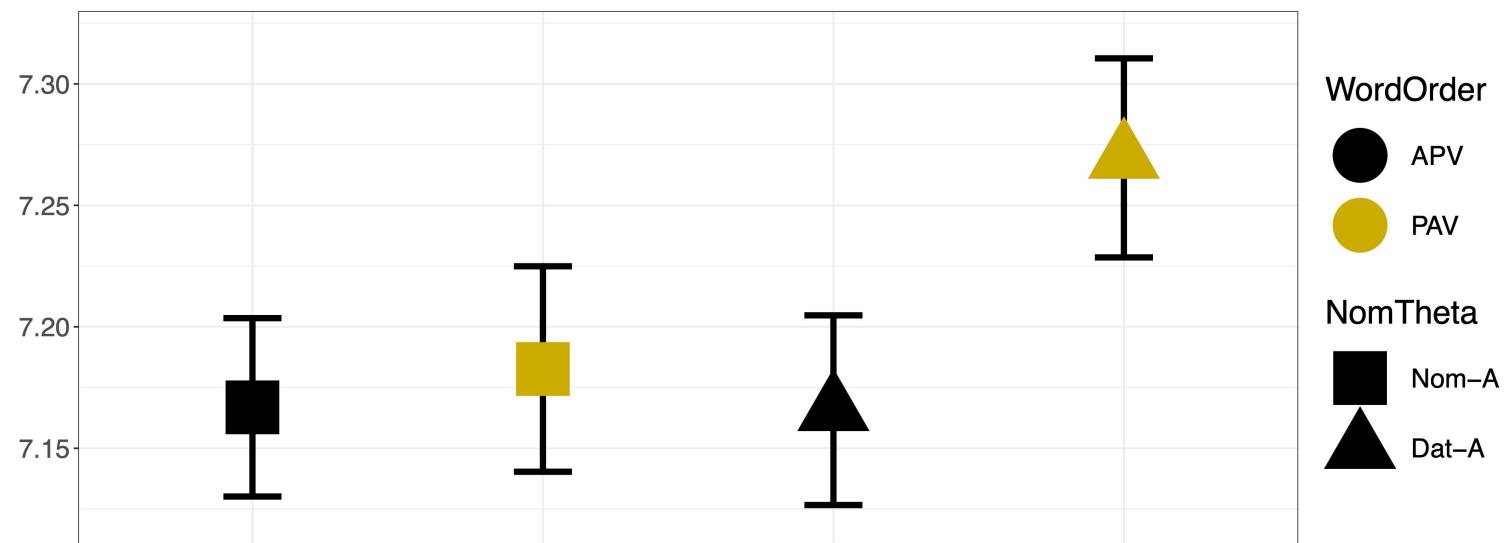


## 4.5 RTs of disambiguating verbs



## 4.6 Key finding: Case–Order Interaction

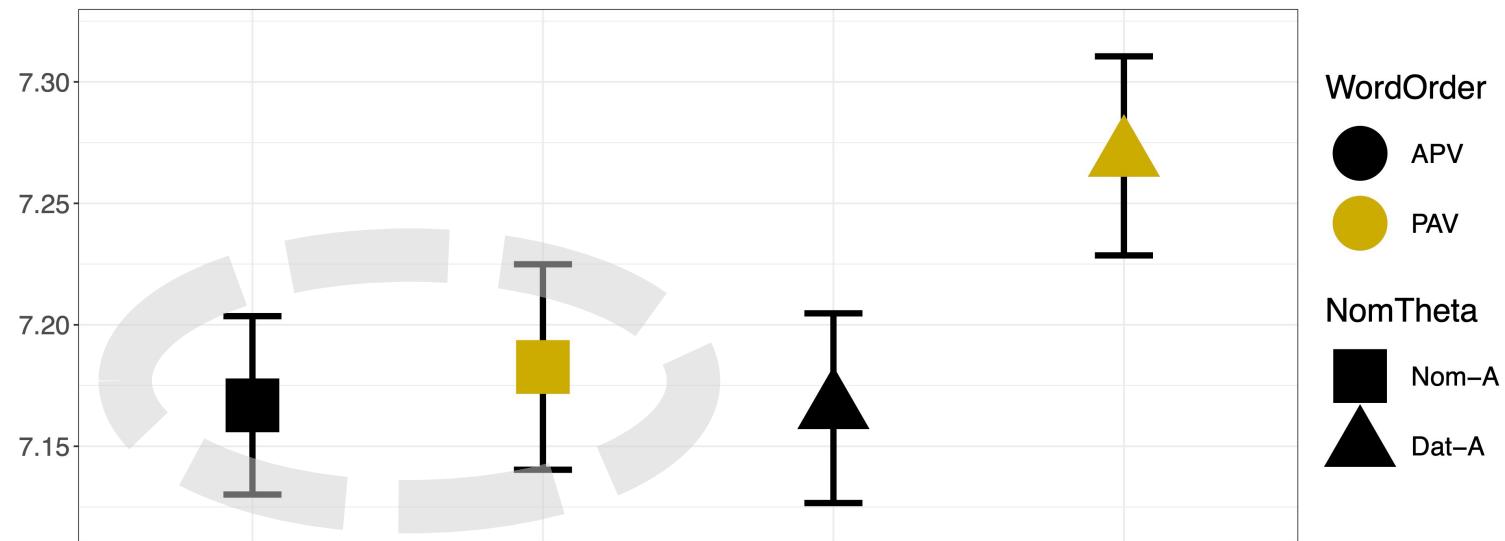
No main effects of Word Order or Case on RTs



## 4.6 Key finding: Case–Order Interaction

No main effects of Word Order or Case on RTs

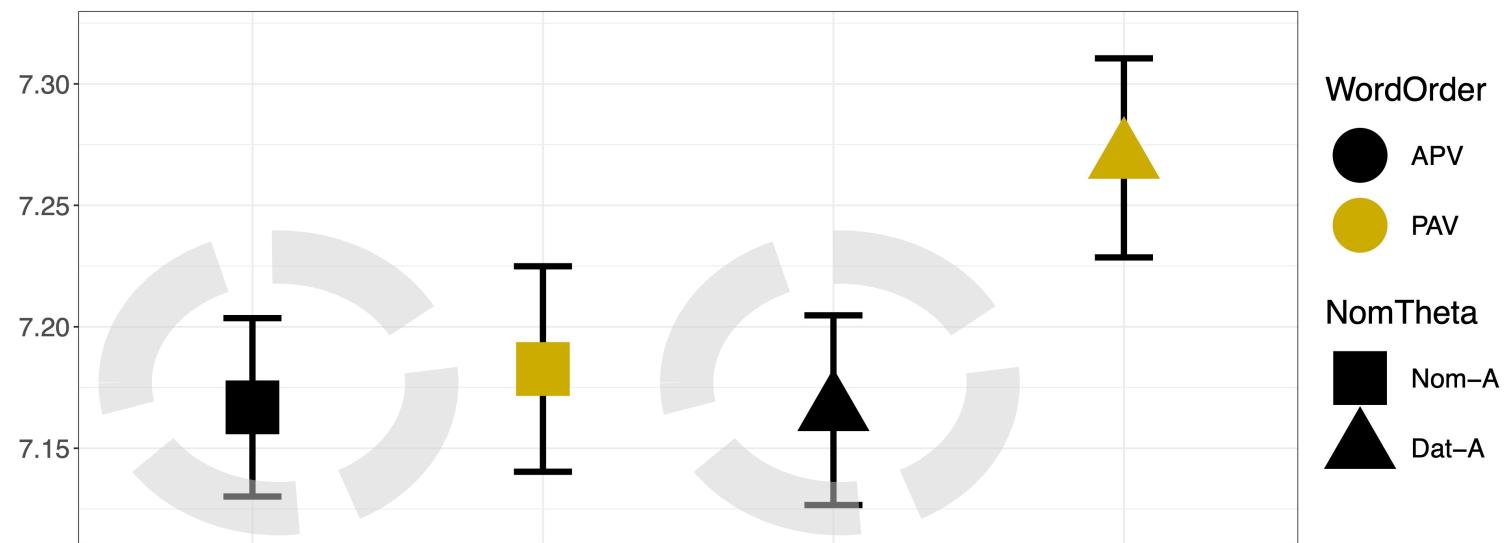
- **Object-first** order (P•A•V) is not inherently difficult relative to subject-first (A•P•V)



## 4.6 Key finding: Case–Order Interaction

No main effects of Word Order or Case on RTs

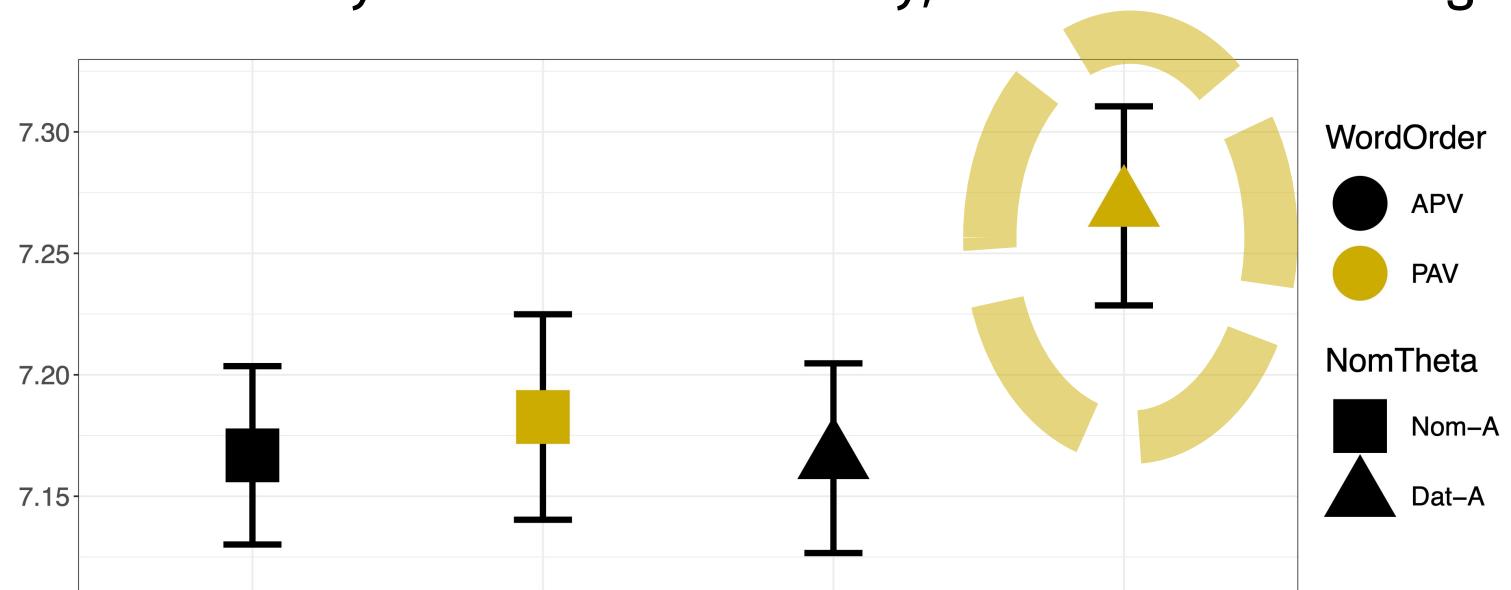
- **Patient-first** order (P•A•V) is not inherently difficult relative to agent-first (A•P•V)
- Nor is the **Dat-A** case pattern (in the perfect) relative to Nom-A (in the future)



## 4.6 Key finding: Case–Order Interaction

But Word Order and Case interact<sup>1</sup>

- Sentences are relatively difficult if they have **patient-first order and Dat-A case**.
- Speakers aren't consciously aware of the difficulty, and it doesn't affect grammaticality.



<sup>1</sup>By post-hoc pairwise comparison:  $\beta = 0.098$ ,  $SE = 0.043$ ,  $t(107) = 2.2$ ,  $p < 0.05$

# Roadmap

1. Introduction
2. Case & Word Order
3. Georgian Case & Word Order
4. Comprehending Georgian Case & Word Order

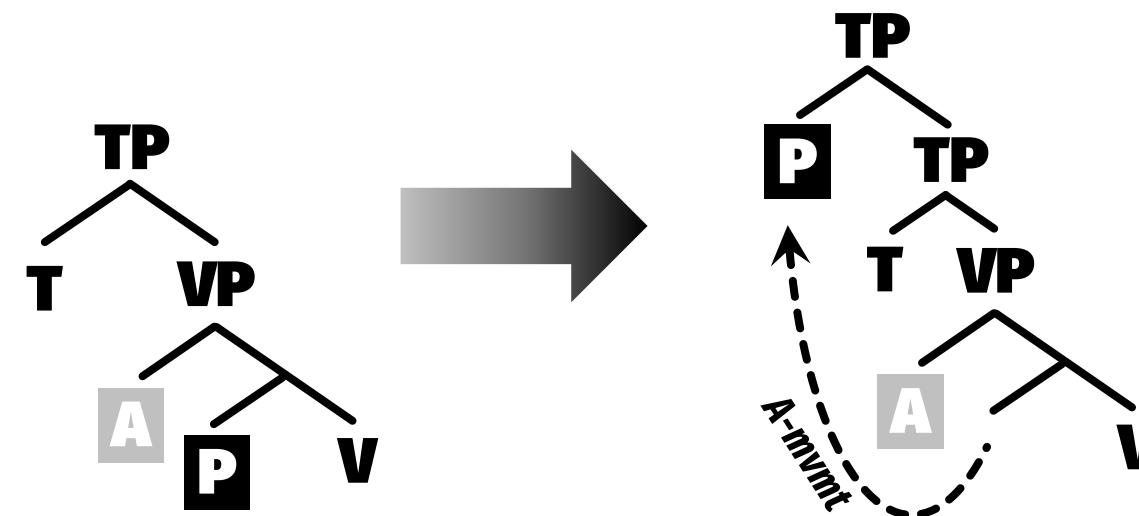
## **5. Theoretical Perspectives**

## **6. Conclusion**

# 5.1 Syntactic explanation

Intuition: Scrambling and dative-raising are too similar.

- Scrambling is widely taken to be A-movement (Mahajan 1990; cf. Miyagawa 1997)

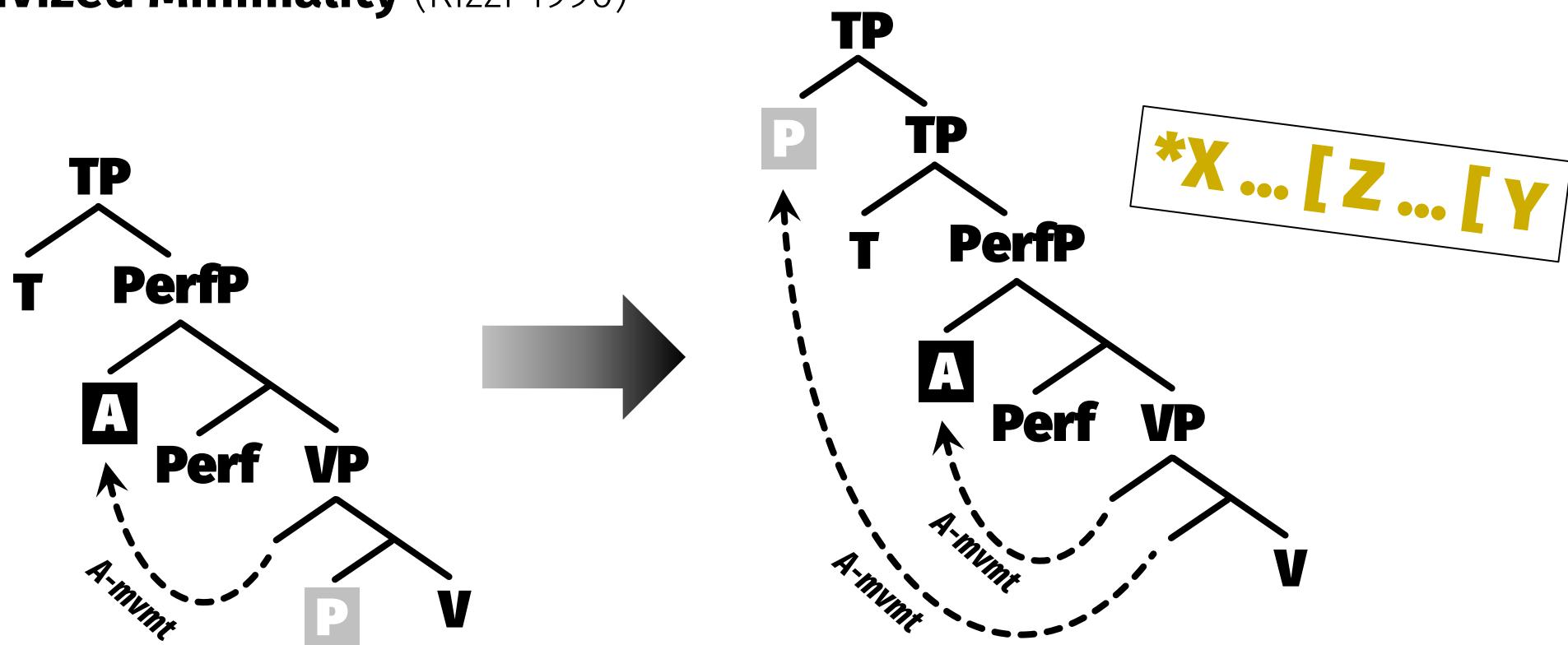


**Step 1:** Build normal future-tense A-P-V clause

**Step 2:** P undergoes scrambling, adjoining to TP

# 5.1 Syntactic explanation

- Since dative-raising is A-movement too, scrambling in Dat-A tenses will violate **Relativized Minimality** (Rizzi 1990)



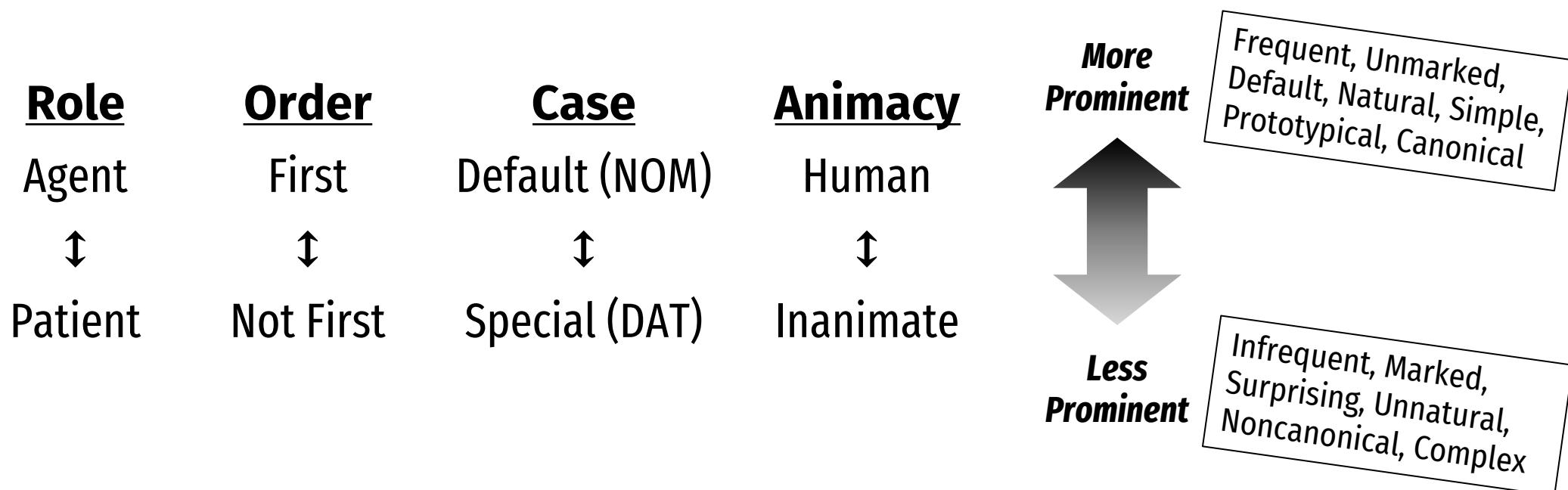
**Step 1:** Build normal perfect-tense A•P•V clause

**Step 2:** P undergoes scrambling, violating RM

## 5.2 A psycholinguistic explanation

Intuition: Prominence scales guide real-time comprehension.

- Faced with ambiguities, parsers assign grammatical roles by aligning prominence scales (eADM; Bornkessel-Schlesewsky & Schlesewsky 2014)



## 5.2 A psycholinguistic explanation

Perhaps **First+Human+NOM** leads to a strong prediction of **A**.

- Rhymes with previous sentence-processing generalizations about V-final Georgian (Skopeteas et al. 2011) and V-Initial Tagalog (Pizarro-Guevara & Garcia 2024).

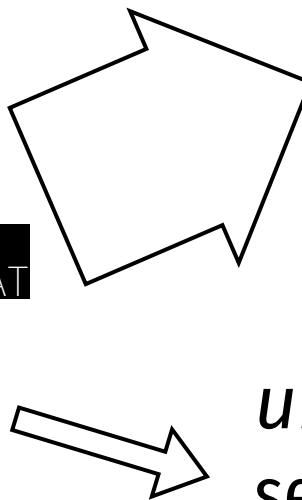
(18) *mts'eral-i*<sub>NOM</sub>    *msaxiob-s*<sub>DAT</sub>  
writer-NOM         actor-DAT

## 5.2 A psycholinguistic explanation

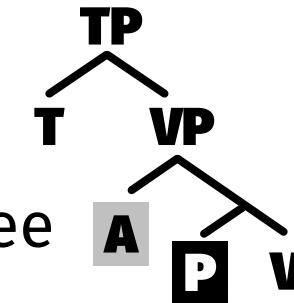
Perhaps **First+Human+NOM** leads to a strong prediction of **A**.

(18) *mts'eral-i<sub>NOM</sub>*  
writer-NOM

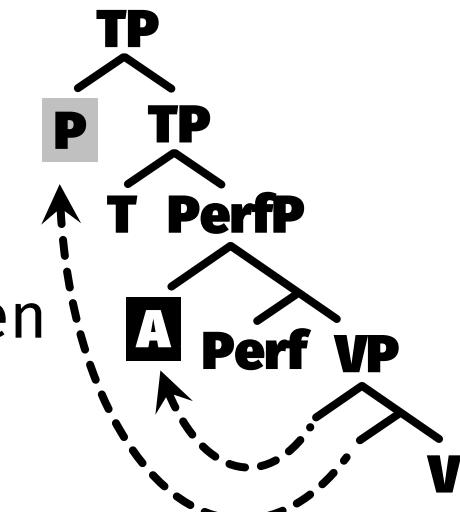
*msaxiob-s<sub>DAT</sub>*  
actor-DAT



*naxavs*  
see:TR:FUT:AGR  
“The writer will see  
the actor” [A•P•V]



*unaxavs*  
see:TR:PERF:AGR  
“The actor has seen  
the writer” [P•A•V]



## 5.3 Teasing the theories apart

There are other movement operations that can target the patient, including **relativization (wh-movement)**

- Syntax: In Dat-A tenses, P-relativization should not violate RM. No processing difficulty is predicted for relative clauses
- Prominence: Initial NOM should garden-path in all contexts. Processing difficulty is predicted for relative clauses.

Indeed the

## 5.3 Teasing the theories apart

There are other movement operations that can target the patient, including **wh-movement** (e.g. in relative clauses)

- (19) *mts'erali, [RC romel-its<sup>h</sup><sub>NOM</sub>* *msaxiob-s<sub>DAT</sub>* *naxavs*  
writer which-NOM actor-DAT *see:TR:FUT:AGR*  
“the writer [RC who \_\_ will see the actor ]”

A undergoes  
wh-mvmt

- (20) *mts'erali, [RC romel-its<sup>h</sup><sub>NOM</sub>* *msaxiob-s<sub>DAT</sub>* *unaxavs*  
writer which-NOM actor-DAT *see:TR:PERF:AGR*  
“the writer [RC who the actor has seen \_\_ ]”

P undergoes  
wh-mvmt

## 5.3 P-extracted RCs in Dat-A tenses

Relativized Minimality predicts no special processing difficulty.

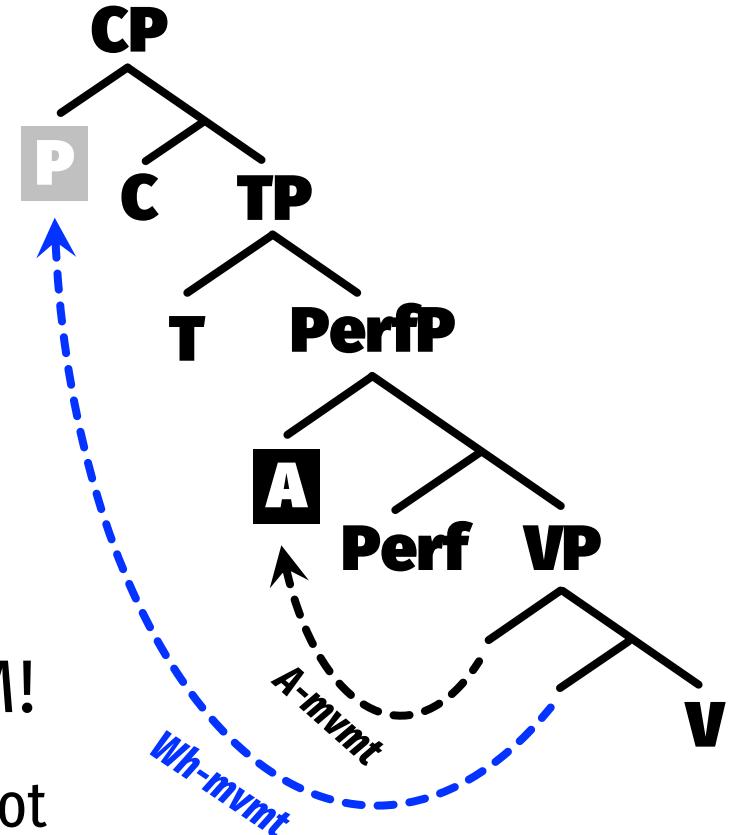
- *Wh*-movement is sufficiently distinct from dative-raising.

Prominence Scales do predict processing difficulty.

- Initial NOM should always cause a garden path.

Previous work (Foley 2020) seems to support RM!

- A'-movement of P causes processing difficulty in Nom-A, but not Dat-A tenses.



## 5.4 Future directions

Low-hanging fruit

- Targeted experimental comparison between **scrambling and relativization**
- Targeted fieldwork on the **syntax of datives** (cf. Belletti & Rizzi 1989, Gerdts & Jhang 1995, Boneh & Nash 2017)
- Return to **-ma<sub>ERG</sub>** (Foley 2020)!

## 5.4 Future directions

### Higher-hanging fruit

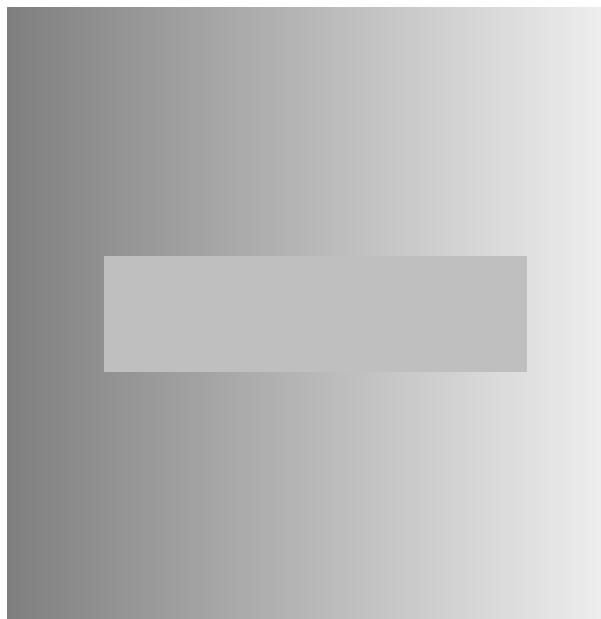
- Other **methods**: visual world (Foley et al. 2019), acceptability (Foley & Amiridze, in prep)
- Parallels **within the word** – How are Georgian's incrementally ambiguous agreement morphemes (Lomashvili & Harley 2011; Foley 2017, 2021) processed?
- **Comparative experimental syntax** in other languages, medium-sized or small

# Roadmap

- ~~1. Introduction~~
- ~~2. Case & Word Order~~
- ~~3. Georgian Case & Word Order~~
- ~~4. Comprehending Georgian Case & Word Order~~
- ~~5. Theoretical Perspectives~~
- 6. Conclusion**

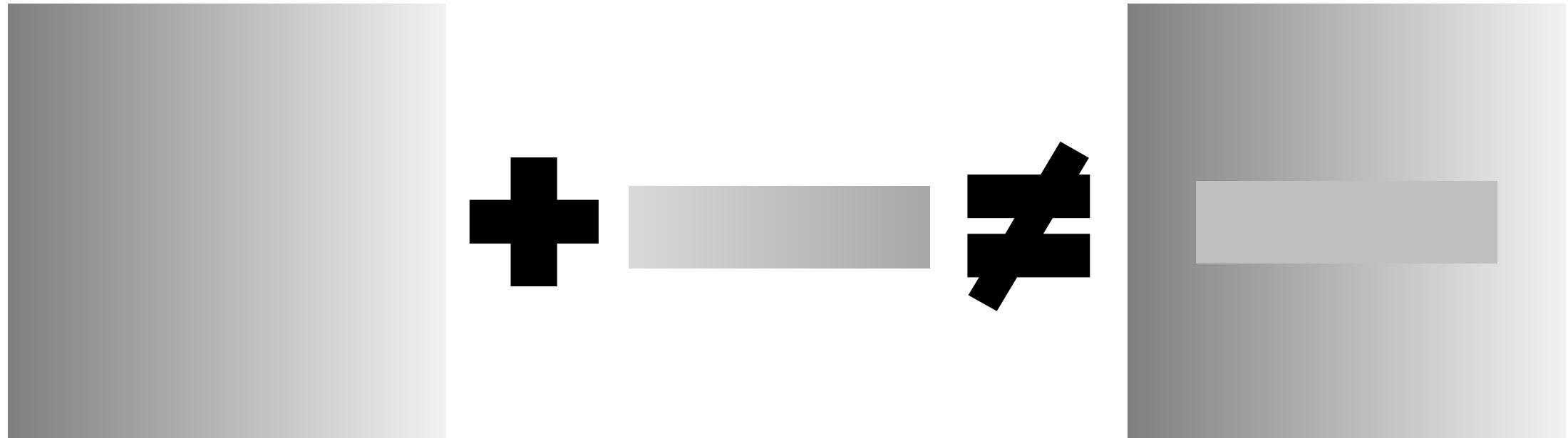
# 6.1 A visual illusion

The simultaneous contrast illusion (Gilchrist 1988)



# 6.1 A visual illusion

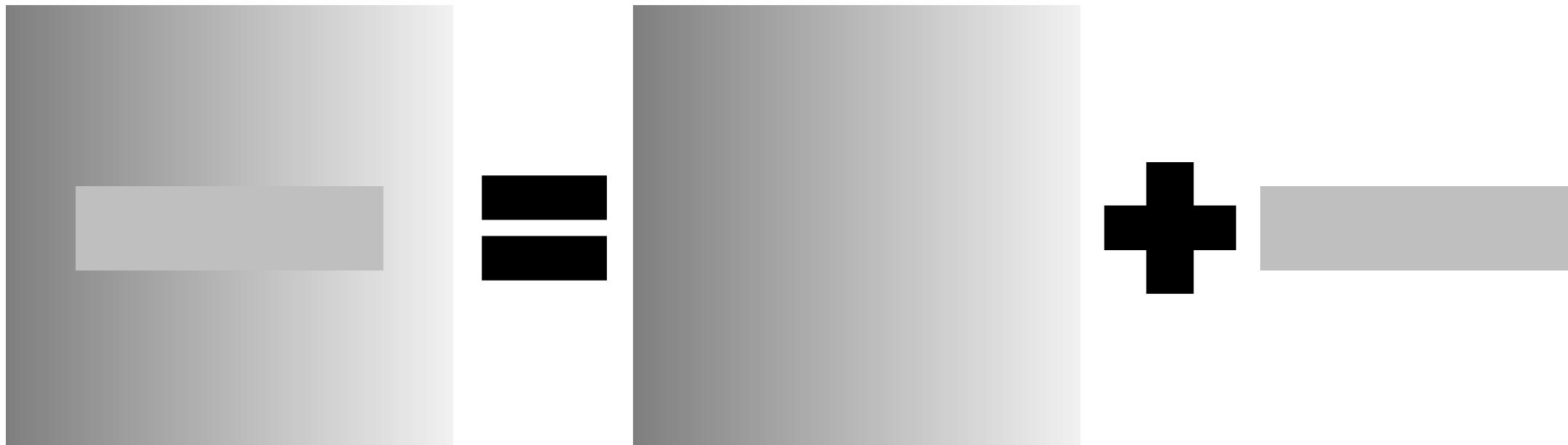
The simultaneous contrast illusion (Gilchrist 1988)



# 6.1 A visual illusion

The simultaneous contrast illusion (Gilchrist 1988)

- On gradient background, a solid grey bar will appear to have a contrasting gradient.



## 6.2 A perspective on syntax

Syntactic theory predicts whether the figure is solid or gradient.



- Syntactic judgements are perceived sensations, akin to color vision.
- Important aspects of that perception might be fleeting, subliminal, or prone to illusion.

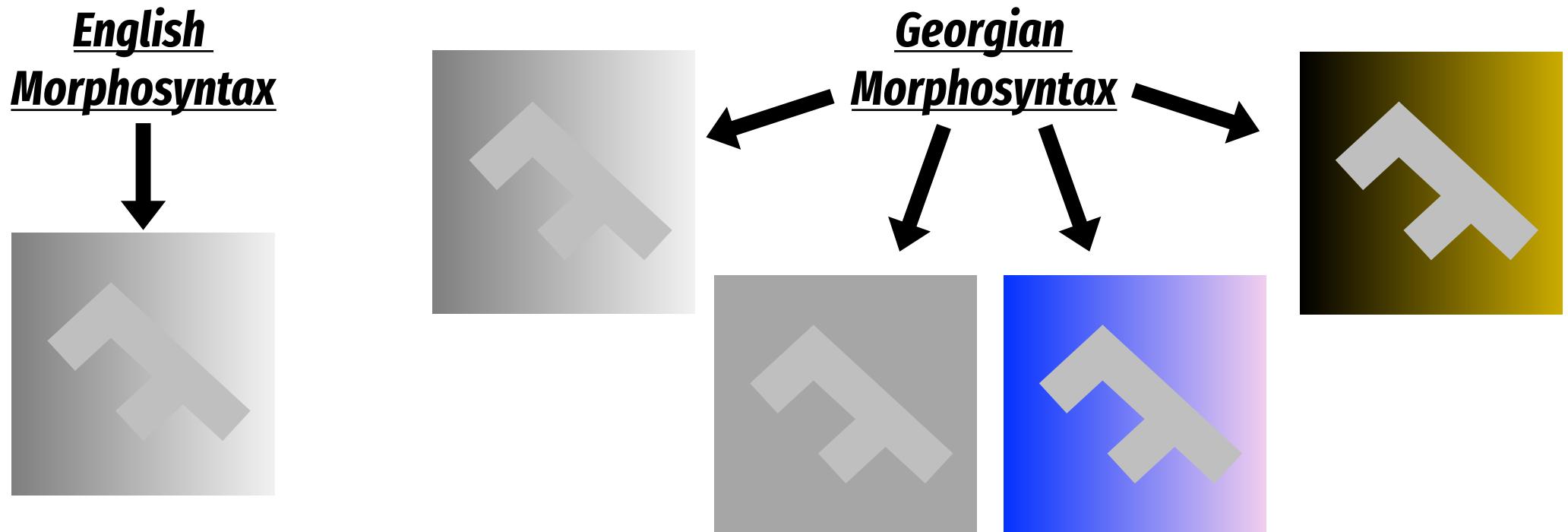
Extra-grammatical factors change the colors of the background.

- Real-time methods offer a sensitive, temporally rich

## 6.2 A perspective on syntax

Grammatical complexity offers contrast more “color palettes”.

- Languages like Georgian offer a crucial lens into the nature of language.



# Special thanks

To my research assistants in Georgia:



**Lizi Baramidze**  
(Independent scholar)



**Tamar Kalkhitashvili**  
(Ilia State University)



**Natia Poniava**  
(Tbilisi State University)



**Irakli Salia**  
(Tbilisi State University)

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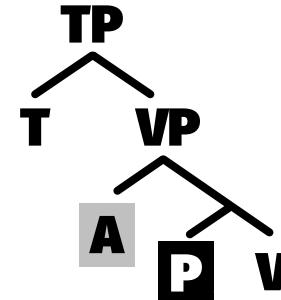
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# Summary

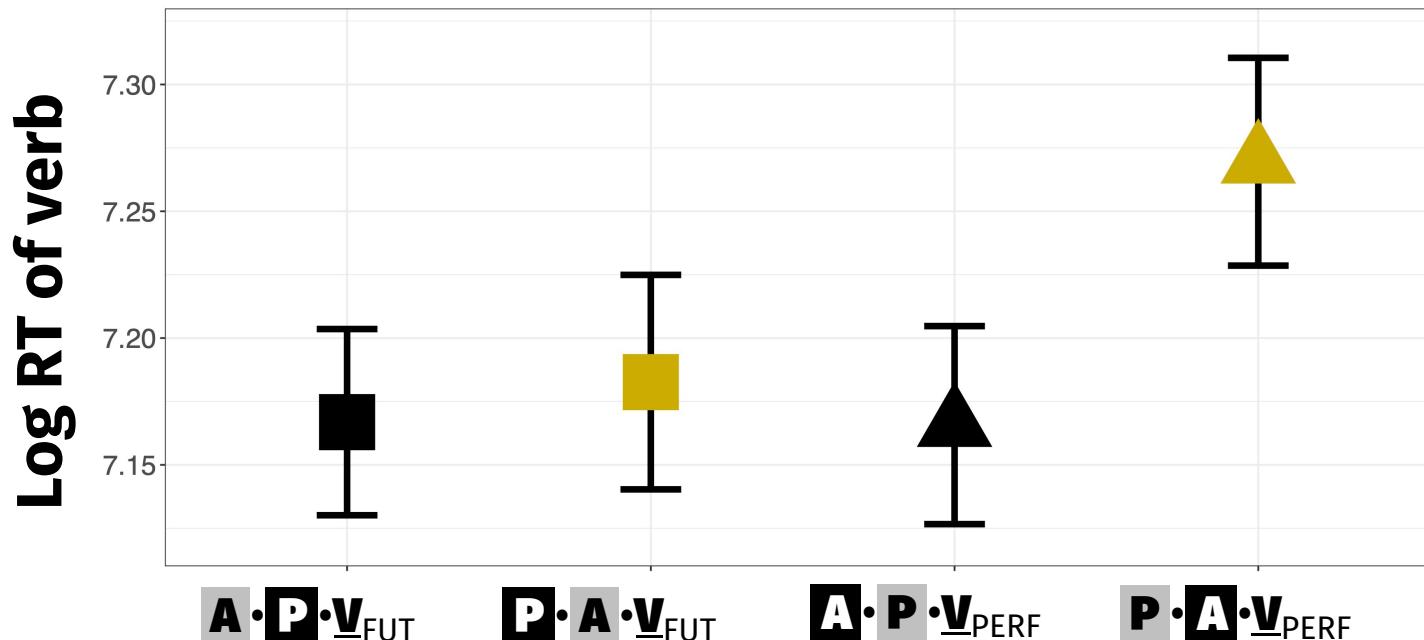
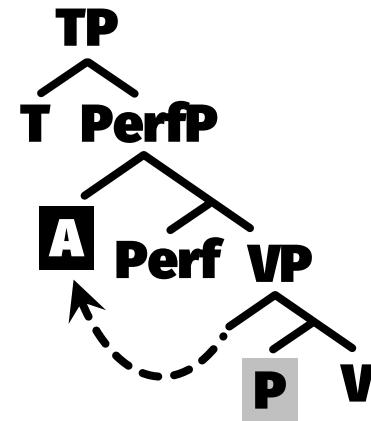
$-i_{\text{NOM}}$   
 $-s_{\text{DAT}}$   
 $-ma_{\text{ERG}}$

	FUT (Nom-A)	A / S / P
	PERF (Dat-A)	A / S / P
	AOR (Erg-A)	A / S / P

## Nom-A Structure



## Dat-A Structure



# The full picture

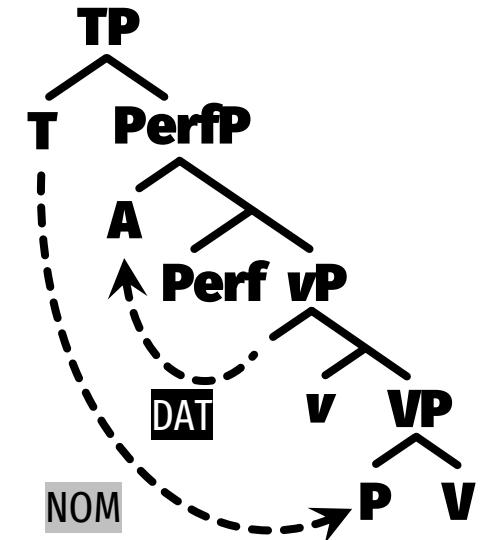
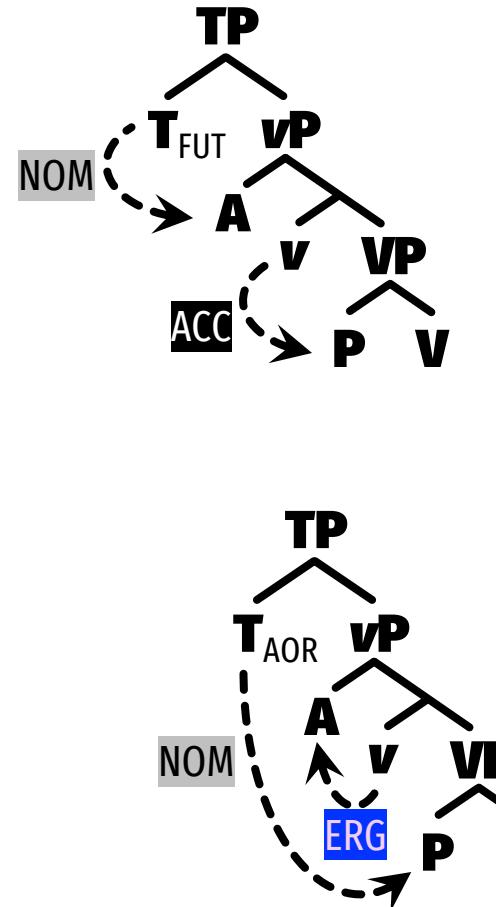
	<b>A</b>	<b>S<sub>A</sub></b>	<b>S<sub>P</sub></b>	<b>P</b>	<b>G</b>	<b>Ex</b>	<b>St</b>
<b>FUT</b>		<b>-i<sub>NOM</sub></b>		<b>-S<sub>DAT</sub></b>			
<b>AOR</b>		<b>-ma<sub>ERG</sub></b>			<b>-S<sub>DAT</sub></b>	<b>-S<sub>DAT</sub></b>	<b>-i<sub>NOM</sub></b>
<b>PERF</b>		<b>-S<sub>DAT</sub></b>		<b>-i<sub>NOM</sub></b>			

	<b>A</b>	<b>S<sub>A</sub></b>	<b>S<sub>P</sub></b>	<b>P</b>	<b>G</b>	<b>Ex</b>	<b>St</b>
<b>-i<sub>NOM</sub></b>	7.9%	3.2%	20.0%	19.5%	0	0	7.0%
<b>-S<sub>DAT</sub></b>	2.0%	0.1%	0	9.1%	13.9%	4.0%	0
<b>-ma<sub>ERG</sub></b>	13.0%	1.4%	0	0	0	0	0

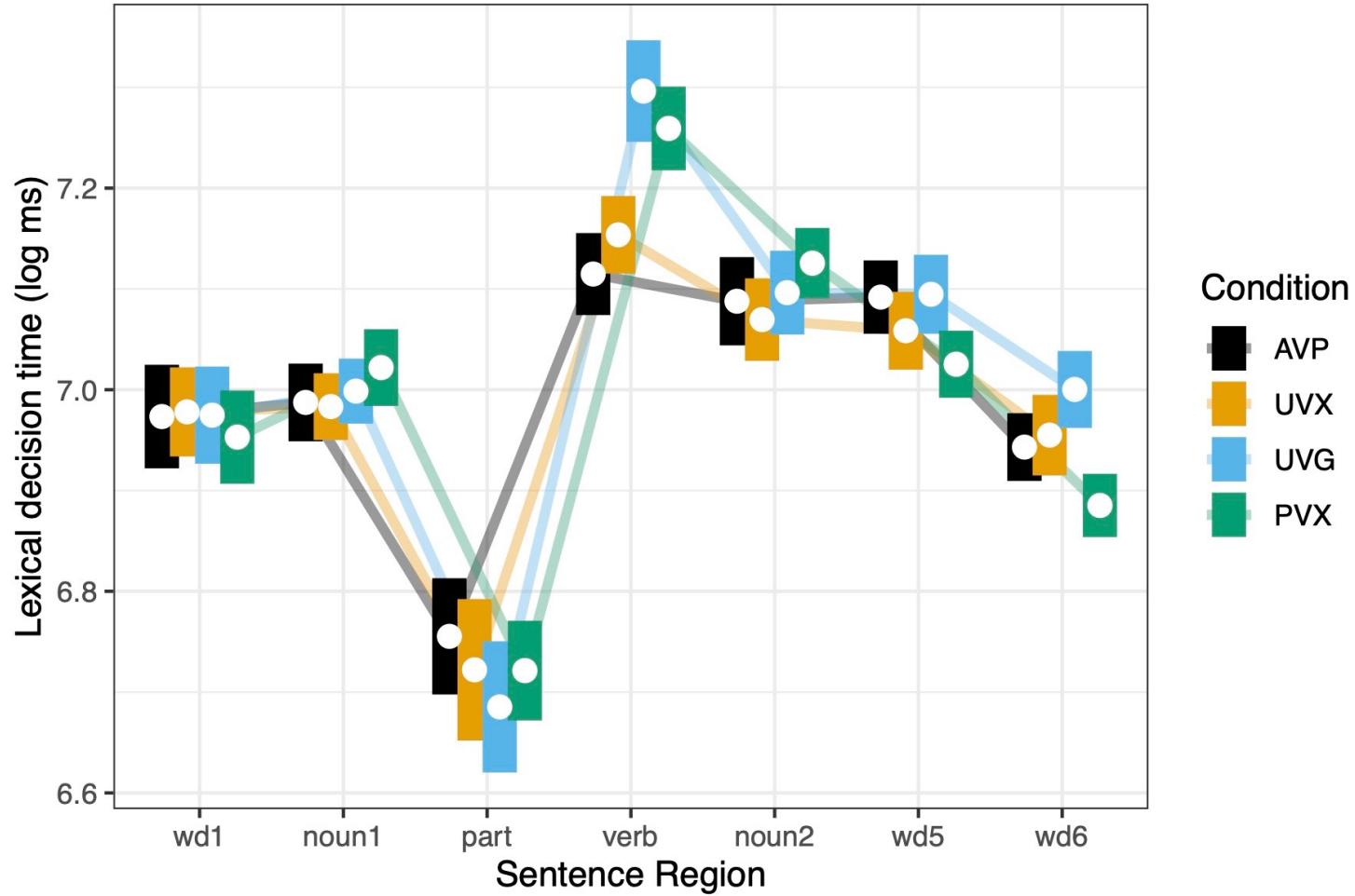
# A working analysis

Extending Legate 2008

- In FUT, *v* assigns structural **ACC** downward via Agree. NB: **ACC**  $\leftrightarrow$  **-S<sub>DAT</sub>**
- In AOR, *v* assigns inherent **ERG** to the external argument.
- In PERF, *v* is deficient (participial?). Perf assigns DAT to the external argument and attracts it into Spec-PerfP.
- In all tenses, T assigns structural **NOM** downward via Agree.



# Full results: NOM<Verb



# Full results: NOM<DAT<Verb & DAT<NOM<Verb

