

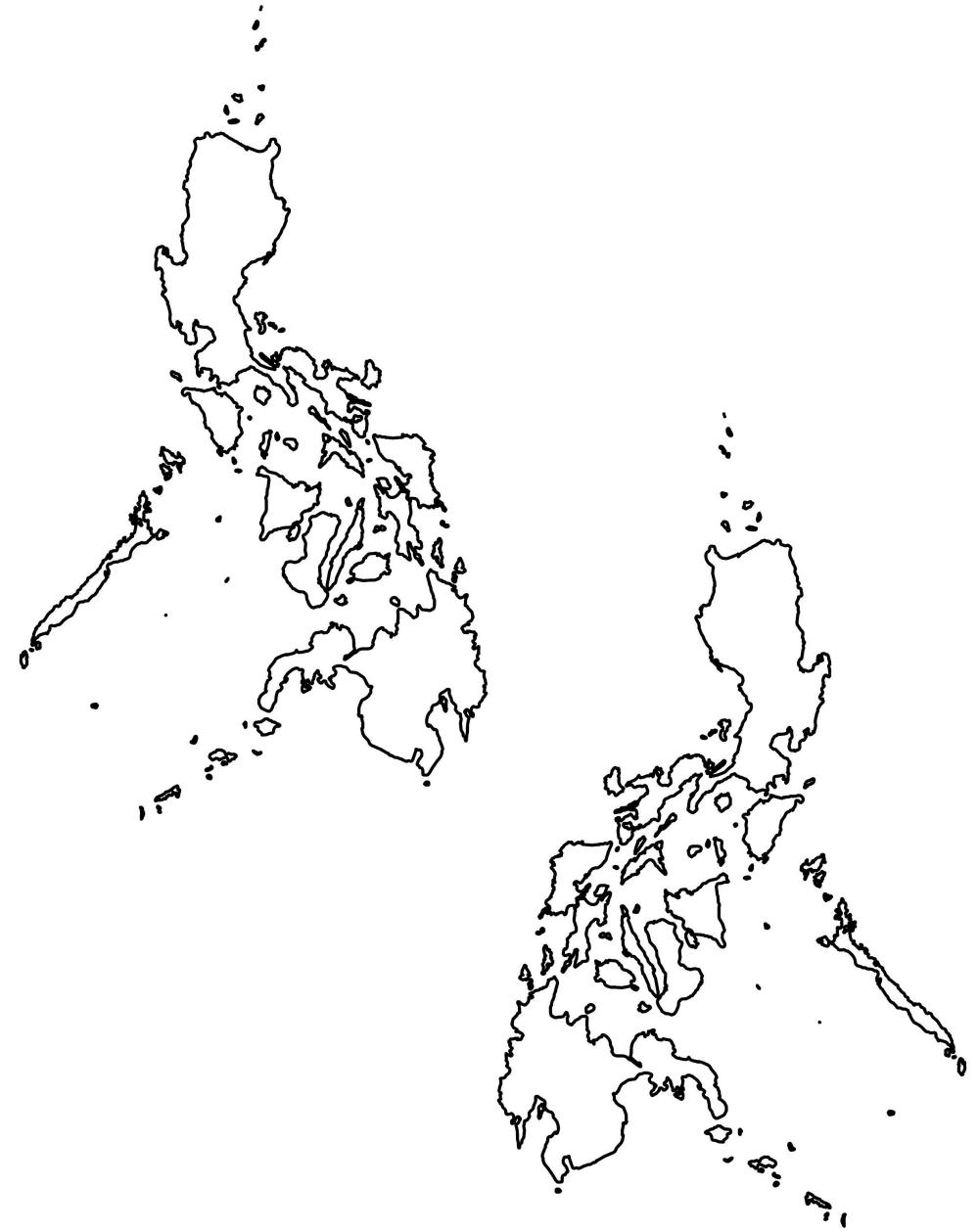
Comprehending Philippine and Reverse-Philippine case alignment

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Introduction

Comparative psycholinguistics & theoretical sentence processing

- What can typologically different languages show us about the mechanisms of real-time comprehension? [eADM; Bornkessel-Schlesewsky & Schlesewsky 2009]
- To what degree is grammar shaped by limitations on processing? [Competition Model; MacWhinney & Bates 1989]

Today's goals

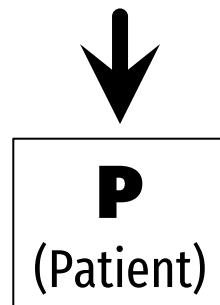
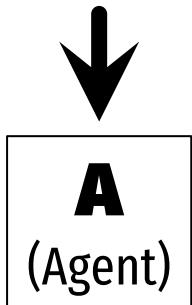
- Highlight parallels between **W. Austronesian**  & **S. Caucasian**  languages
- Theorize about the processing of **high-entropy case alignment** vis-à-vis the **verb**
- Articulate **predictions** to inspire work leveraging complexity & microvariation

Comprehending thematic roles

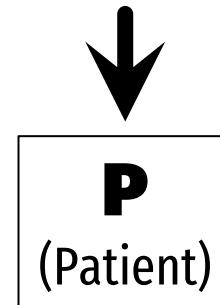
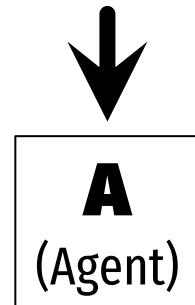
Sentences are processed quickly, incrementally, and actively [e.g. Ferreira & Qiu 2021]. Key is identifying **who did what to whom**.



The fox is biting the dog



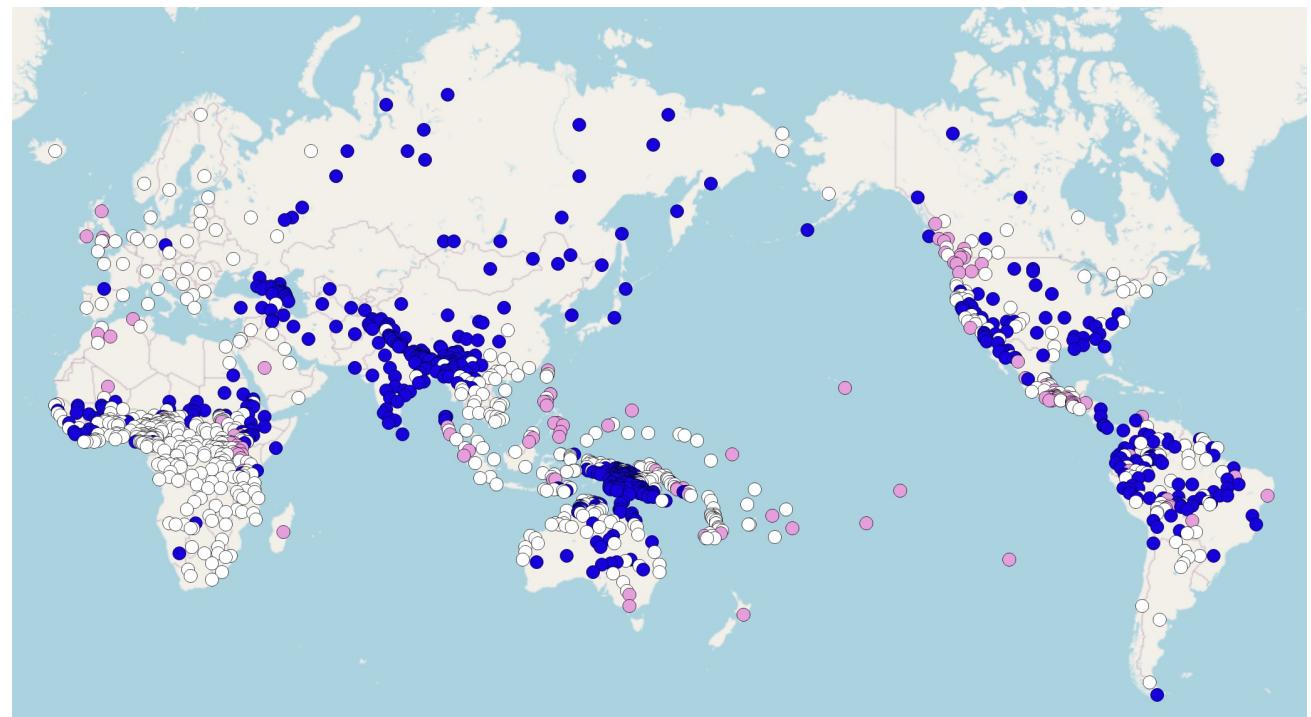
The dog is biting the fox



Cues influencing θ-processing

The verb

- Verbal lexical semantics are at the heart of the conceptualized event
- Yet, **verb-final** languages outnumber **verb-initial** ones!
 - Lavender dot = Verb-Initial
 - Blue dot = Verb-Final



[WALS, Ch 81; Dryer & Haspelmath 2013]

Cues influencing θ-processing

Word order

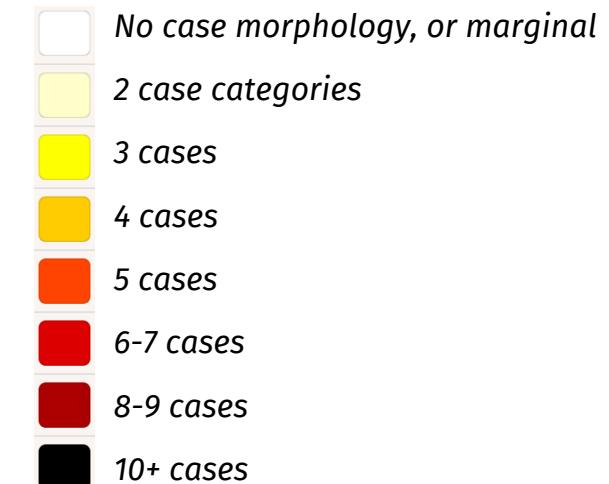
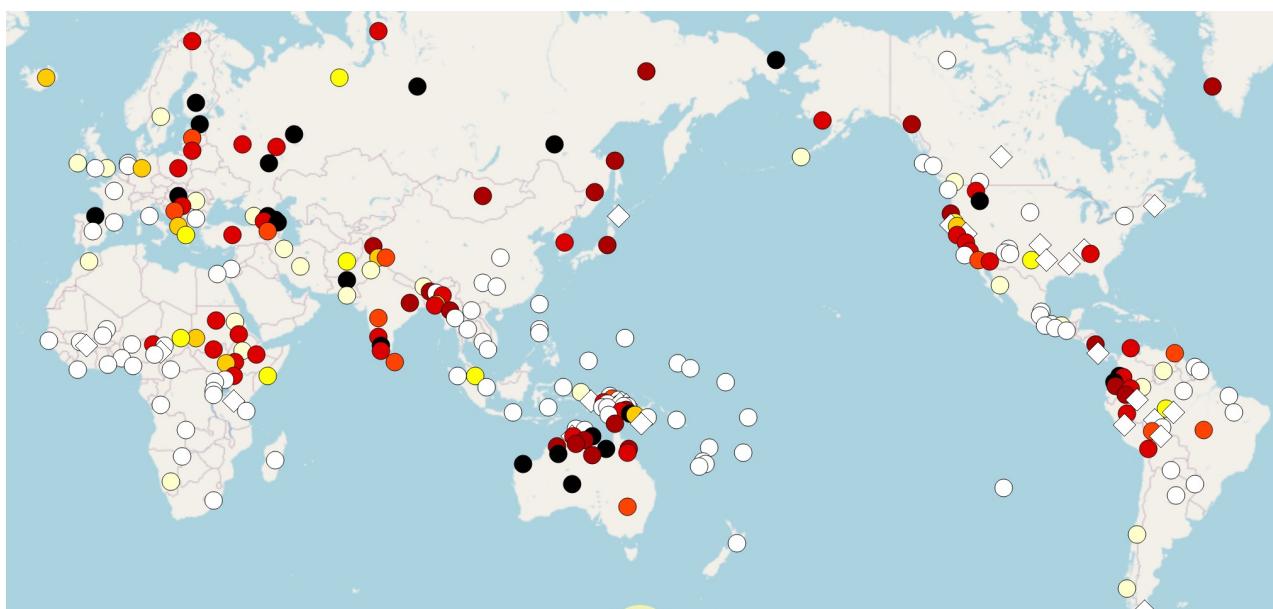
- In some languages, the *only* grammatical word order is **A<P**. In others, it's flexible.
- But even in flexible languages, there's often an **A-initial preference** [e.g. German: Bader & Meng 1999; Turkish: Demiral et al. 2008; Chamorro: Wagers et al. 2015]
- Rooted deeply in cognition [Sauppe et al. 2023]? But possibly not universal [e.g. Kaqchikel Mayan: Koizumi et al. 2014]

Lg where word order is...	Odds of NP1's θ-role	Cue Utility
Strict	$p(\mathbf{A} 1\text{st}) \approx 1$ $p(\mathbf{P} 1\text{st}) \approx 0$	Great
Flexible	$p(\mathbf{A} 1\text{st}) > p(\mathbf{P} 1\text{st})$	Ok
Free	$p(\mathbf{A} 1\text{st}) \approx p(\mathbf{P} 1\text{st})$	Poor

Cues influencing θ-processing

Case

- A major locus of **crosslinguistic variation** – many diverse patterns, including none at all
- Rich case marking correlates with **flexible word order**, and **verb finality** (Greenberg 1963, Bickel et al. 2015)



(WALS, Ch 49; Dryer & Haspelmath 2013)

Cues influencing θ-processing

Case

- An **important cue** for comprehension in every language investigated so far!
- Affects reading times (Bader & Meng 1999), eye movements (Henry et al. 2017), **and neurophysiological responses** (Chow et al. 2018)
- **Including in 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).

Lg where case is...	Odds of θ-role given case morpheme κ	Cue Utility
Straight-forward	$p(\mathbf{A} \kappa) \approx 1$ $p(\mathbf{P} \kappa) \approx 0$	Great
Complex	$p(\mathbf{A} \kappa) > p(\mathbf{P} \kappa)$	Ok
Sadistic	$p(\mathbf{A} \kappa) \approx p(\mathbf{P} 1st)$	Poor

Philippine Case Alignment

Paiwan (Formosan) [after Chen & McDonnell 2019]

	Verb	Agt	Pat	Obl
(1a)	<i>Qmalup</i>	<i>a caucau</i>	<i>tua vavuy</i>	<i>i gadu.</i>

hunt:AV ALPHA man BETA pig GAMMA mount'n
"The man hunts wild pigs in the mountains"

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(1a)	<i>Qmalup</i>	<i>a caucau</i>	<i>tua vavuy</i>	<i>i gadu.</i>
	hunt:AV	ALPHA man	BETA pig	GAMMA mount'n
	“The man hunts wild pigs in the mountains”			
(1b)	<i>Qalupen</i>	<i>nua caucau</i>	<i>a vavuy</i>	<i>i gadu.</i>
	hunt:PV	DELTA man	ALPHA pig	GAMMA mount'n
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	hunt:PV	DELTA man	ALPHA pig	GAMMA mount'n
	“The man hunts <u>wild pigs</u> in the mountains”			
(1c)	<i>Qalupan</i>	<i>nua caucau</i>	<i>tua vavuy</i>	<i>a gadu.</i>
	hunt:OV	DELTA man	BETA pig	ALPHA mount'n
	“The man hunts wild pigs <u>in the mountains</u> ”			

Philippine Case Alignment

Paiwan (Formosan) [after Chen & McDonnell 2019]

- One cosmopolitan “pivot” marker (**ALPHA**) that overwrites various “inherent” cases (**BETA=Pat**, **DELTA=Agt**, **GAMMA=Obl**)

	Verb	Agt	Pat	Obl
(1a)	<i>Qmalup</i>	<i>a caucau</i>	<i>tua vavuy</i>	<i>i gadu.</i>
	hunt:AV	ALPHA man	BETA pig	GAMMA mount'n
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- Special inflection (“voice morphology”) on **clause-initial verbs** disambiguates **ALPHA**

	Verb	Agt	Pat	Obl
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	hunt:PV	DELTA man	ALPHA pig	GAMMA mount'n
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- Special inflection (“voice morphology”) on **clause-initial verbs** disambiguates **ALPHA**
- Case–role mapping is generally sensitive to **topichood** [e.g. Chen, to appear]

	Verb	Agt	Pat	Obl
(1a)	<i>Qmalup</i>	<i>a caucau</i>	<i>tua vavuy</i>	<i>i gadu.</i>
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	“The man hunts wild pigs <u>in the</u> mountains”			

Philippine Case Alignment

Tagalog (Philippine) [after Rackowski & Richards 2005]

	Verb	Agt	Pat	Obl
(2a)	<i>Bumili</i>	<i>ang bata</i>	<i>ng tela</i>	<i>sa palengke.</i>
	buy:AV	ALPHA child	BETA cloth	GAMMA market
		"The child bought cloth at the market"		
(2b)	<i>Binili</i>	<i>ng bata</i>	<i>ang tela</i>	<i>sa palengke.</i>
	buy:PV	BETA child	ALPHA cloth	GAMMA market
		"The child bought <u>the cloth</u> at the market"		
(2c)	<i>Binilhan</i>	<i>ng bata</i>	<i>ng tela</i>	<i>ang palengke.</i>
	buy:OV	BETA child	BETA cloth	ALPHA market
		"The child bought cloth <u>at the market</u> "		

Philippine Case Alignment

Tagalog (Philippine) [after Rackowski & Richards 2005]

- Pivot case (**ALPHA**) still has wide distribution
- One inherent case (**GAMMA**=**Obl**), another “default” case (**BETA**=**Agt/Pat**)
- V1-voice morphology usually disambiguates both **ALPHA** and **BETA**

	Verb	Agt	Pat	Obl
(2a)	<i>Bumili</i>	<i>ang bata</i>	<i>ng tela</i>	<i>sa palengke.</i>
	buy: AV	ALPHA child	BETA cloth	GAMMA market
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	buy: OV	BETA child	BETA cloth	ALPHA market
	“The child bought cloth <u>at the market</u> ”			

Reverse-Philippine Alignment

Georgian (South Caucasian) [Shanidze 1953, Harris 1985, Nash 2017]

Agt	Obl	Pat	Verb
(3a) <i>ekʰim-i</i> doctor- ALPHA	<i>mχat'var-s</i> painter- BETA	<i>ts'i gn-s</i> book- BETA	<i>atʃ'venebs.</i> show: FUT

“The doctor will show the book to the painter”

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Agt	Obl	Pat	Verb
(3a) <i>ekʰim-i</i> doctor- ALPHA	<i>mχat'var-s</i> painter- BETA	<i>ts'i gn-s</i> book- BETA	<i>atʃ'venebs.</i> show: FUT
			“The doctor <u>will show</u> the book to the painter”
(3b) <i>ekʰim-ma</i> doctor- DELTA	<i>mχat'var-s</i> painter- BETA	<i>ts'i gn-i</i> book- ALPHA	<i>atʃ'vena.</i> show: AOR
			“The doctor <u>showed</u> the book to the painter”

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	Agt	Obl	Pat	Verb
(3a)	<i>ekʰim-i</i> doctor- ALPHA	<i>mxat'var-s</i> painter- BETA	<i>ts'ign-s</i> book- BETA	<i>atʃ'venebs.</i> show: FUT
				“The doctor <u>will show</u> the book to the painter”
(3b)	<i>ekʰim-ma</i> doctor- DELTA	<i>mxat'var-s</i> painter- BETA	<i>ts'ign-i</i> book- ALPHA	<i>atʃ'vena.</i> show: AOR
				“The doctor <u>showed</u> the book to the painter”
(3c)	<i>ekʰim-s</i> doctor- BETA	<i>mxat'vr-istʰvis</i> painter- GAMMA	<i>ts'ign-i</i> book- ALPHA	<i>utʃ'venebia.</i> show: PERF
				“The doctor <u>must have shown</u> the book to the painter”

Reverse-Philippine Alignment

Georgian (South Caucasian) [Shanidze 1953, Harris 1985, Nash 2017]

- Two very cosmopolitan cases
(ALPHA & BETA)

	Agt	Obl	Pat	Verb
(3a)	<i>ekʰim-i</i> doctor- ALPHA	<i>mxat'var-s</i> painter- BETA	<i>ts'ign-s</i> book- BETA	<i>atʃ'venebs.</i> show: FUT
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				“The doctor <u>must have shown</u> the book to the painter”

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- Two very cosmopolitan cases
(ALPHA & BETA)
- Two inherent cases
(GAMMA=Obl, DELTA=Agt)

	Agt	Obl	Pat	Verb
(3a)	<i>ekʰim-i</i> doctor- ALPHA	<i>mxat'var-s</i> painter- BETA	<i>ts'ign-s</i> book- BETA	<i>atʃ'venebs.</i> show: FUT
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				“The doctor <u>must have shown</u> the book to the painter”

Reverse-Philippine Alignment

Georgian (South Caucasian) [Shanidze 1953, Harris 1985, Nash 2017]

- Two very cosmopolitan cases
(**ALPHA** & **BETA**)
- Two inherent cases
(**GAMMA**=Obl, **DELTA**=Agt)
- Case-role mapping is determined by **tense** morphology on **clause-final verbs**

	Agt	Obl	Pat	Verb
(3a)	<i>ekʰim-i</i> doctor- ALPHA	<i>mχat'var-s</i> painter- BETA	<i>ts'ign-s</i> book- BETA	<i>atʃ'venebs.</i> show: FUT
				"The doctor <u>will show</u> the book to the painter"
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				"The doctor <u>showed</u> the book to the painter"
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				"The doctor <u>must have shown</u> the book to the painter"

Summary

Philippine Case Alignment

Paiwan (V-initial)

	Agt	Pat	Obl
AV	ALPHA	BETA	GAMMA
PV	DELTA	ALPHA	GAMMA
OV	DELTA	BETA	ALPHA

Tagalog (V-initial)

	Agt	Pat	Obl
AV	ALPHA	BETA	GAMMA
PV	BETA	ALPHA	GAMMA
OV	BETA	BETA	ALPHA

Reverse-Philippine Case Alignment

Georgian (V-final)

	Agt	Pat	Obl
T1	ALPHA	BETA	BETA
T2	DELTA	ALPHA	BETA
T3	BETA	ALPHA	GAMMA

Normie Case Alignment

Classical Nom/Acc

	Agt	Pat	Obl
Any	ALPHA	BETA	GAMMA

Georgian = Bizarro-Tagalog

Despite many typological differences, W. Austronesian and S. Caucasian languages are eerily similar.

- | | Verb | N1 | N2 |
|------|------------------------------|--------------------|-------------------|
| (4a) | <i>Pumatay</i> | ang balyena | ng pating. |
| | kill:AV | ALPHA whale | BETA shark |
| | “The whale killed the shark” | | |
| (4b) | <i>Pinatay</i> | ang balyena | ng pating. |
| | kill:PV | ALPHA child | BETA shark |
| | “The shark killed the whale” | | |

[Hsieh 2016]

- | | N1 | N2 | Verb |
|------|--------------------------------------|--------------------|------------------|
| (5a) | <i>vesap'-i</i> | zvigen-s | <i>mok'lavs</i> |
| | whale- ALPHA | whale- BETA | kill:FUT |
| | “The whale will kill the shark” | | |
| (5a) | <i>vesap'-i</i> | zvigen-s | <i>mouk'lavs</i> |
| | whale- ALPHA | whale- BETA | kill:PERF |
| | “The shark must've killed the whale” | | |

Georgian = Bizarro-Tagalog

Despite many typological differences, W. Austronesian and S. Caucasian languages are eerily similar.

- In both, comprehenders must **attend to the verb** to comprehend case alignment.

Verb	N1	N2
(4a) <i>Pumatay</i> ang balyena ng pating.	kill:AV ALPHA whale BETA shark	"The whale killed the shark" [V _{AV} •A•P]

Verb	N1	N2
(4b) <i>Pinatay</i> ang balyena ng pating.	kill:PV ALPHA child BETA shark	"The shark killed the whale" [V _{PV} •P•A]

[Hsieh 2016]

N1	N2	Verb
(5a) <i>vesap'-i</i>	<i>zvigen-s</i>	<i>mok'lavs</i>

N1	N2	Verb
(5a) <i>vesap'-i</i>	<i>zvigen-s</i>	<i>mouk'lavs</i>

Georgian = Bizarro-Tagalog

Despite many typological differences, W. Austronesian and S. Caucasian languages are eerily similar.

- In both, comprehenders must **attend to the verb** to comprehend case alignment.
- These seem like **gratuitously complex** ways to grammatically signal θ -roles!

Verb	N1	N2
(4a) <i>Pumatay</i>	<i>ang balyena</i>	<i>ng pating.</i>
kill:AV	ALPHA whale	BETA shark

"The whale killed the shark" [$V_{AV} \cdot A \cdot P$]

Verb	N1	N2
(4b) <i>Pinatay</i>	<i>ang balyena</i>	<i>ng pating.</i>
kill:PV	ALPHA child	BETA shark

"The shark killed the whale" [$V_{PV} \cdot P \cdot A$]

[Hsieh 2016]

N1	N2	Verb
(5a) <i>vesap'-i</i>	<i>zvigen-s</i>	<i>mok'lavs</i>
whale-ALPHA	whale-BETA	kill:FUT

"The whale will kill the shark" [$A \cdot P \cdot V_{T_1}$]

N1	N2	Verb
(5a) <i>vesap'-i</i>	<i>zvigen-s</i>	<i>mouk'lavs</i>
whale-ALPHA	whale-BETA	kill:PERF

"The shark must've killed the whale" [$P \cdot A \cdot V_{T_3}$]

But just how complex?

$H(r|k)$ = Role-case entropy

- Conditional entropy is a **measure of uncertainty** about one variable given knowledge of another.

$$H(r|k) = -\sum_{r \in R, k \in K} P(r \& k) \log P(r|k)$$

(sum of odds-weighted conditional-surprisal values for all role-case combinations)

- $H(r|k)$ measures, abstractly, **how difficult it is to parse** an argument's grammatical role based on its case morphology.



But just how complex?

$H(r|k)$ = Role-case entropy

- Conditional entropy is a **measure of uncertainty** about one variable given knowledge of another.

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(sum of odds-weighted conditional-surprisal values for all role-case combinations)



- $H(r|k)$ measures, abstractly, **how difficult it is to parse** an argument's grammatical role based on its case morphology.

Low Conditional Entropy Conjecture [Ackerman & Malouf 2013]

- Grammars can **only be so entropic** before they are unlearnable.
- Attested case systems are less entropic than they could be [Foley 2022].

(Reverse) Philippine = High Entropy

Tagalog • $H(r|k) = 1.30$ bits

	Agt	Pat	Obl	Thm
AV	ALPHA	BETA	GAMMA	ALPHA
PV	BETA	ALPHA	GAMMA	n/a
OV	BETA	BETA	ALPHA	BETA
RPV	BETA	BETA	GAMMA	BETA

Paiwan • $H(r|k) = 0.89$ bits

	Agt	Pat	Obl	Thm
AV	ALPHA	BETA	GAMMA	ALPHA
PV	DELTA	ALPHA	GAMMA	n/a
OV	DELTA	BETA	ALPHA	BETA

Georgian • $H(r|k) = 1.22$ bits

	Agt	Pat	Obl	Thm
T1	ALPHA	BETA	BETA	ALPHA
T2	DELTA	ALPHA	BETA	ALPHA
T3	BETA	ALPHA	GAMMA	ALPHA

Nom/Acc • $H(r|k) = 0.50$ bits

	Agt	Pat	Obl	Thm
Any	ALPHA	BETA	GAMMA	ALPHA

Processing Philippine Case

**Processing
Tasks:**

<p><i>Pumatay/</i> <i>Pinatay</i> kill:VOICE</p> <p>Verb</p> <p>[<u>voice</u>: AV/PV]</p> <p>[<u>roles</u>: θ_1, θ_2]</p>		
<ul style="list-style-type: none">• Access lexical semantics• Predict two NPs		

[cf. Wagstaff
et al. 2018]

Processing Philippine Case

**Processing
Tasks:**

<p><i>Pumatay/</i> <i>Pinatay</i> kill:VOICE</p> <p>Verb</p> <p>[<u>voice</u>: AV/PV] [<u>roles</u>: θ_1, θ_2]</p>	<p><i>ang/ng balyena</i> CASE whale</p> <p>N1</p> <p>[<u>case</u>: κ_1]</p>	
<ul style="list-style-type: none">• Access lexical semantics• Predict two NPs	<ul style="list-style-type: none">• Retrieve voice• Calculate role• Integrate N1 with V	[cf. Wagars et al. 2018]

Processing Philippine Case

**Processing
Tasks:**

<p><i>Pumatay/</i> <i>Pinatay</i> kill:VOICE</p> <p>Verb [voice: AV/PV] [roles: θ_1, θ_2]</p>	<p><i>ang/ng balyena</i> CASE whale</p> <p>N1 [case: κ_1]</p>	<p><i>ng/ang pating</i> CASE shark</p> <p>N2 [case: κ_2]</p>
<ul style="list-style-type: none">• Access lexical semantics• Predict two NPs	<ul style="list-style-type: none">• Retrieve voice• Calculate role• Integrate N1 with V	<ul style="list-style-type: none">• Retrieve voice• Calculate role• Integrate N2 with V & N1

[cf. Waggers
et al. 2018]

Processing Philippine Case

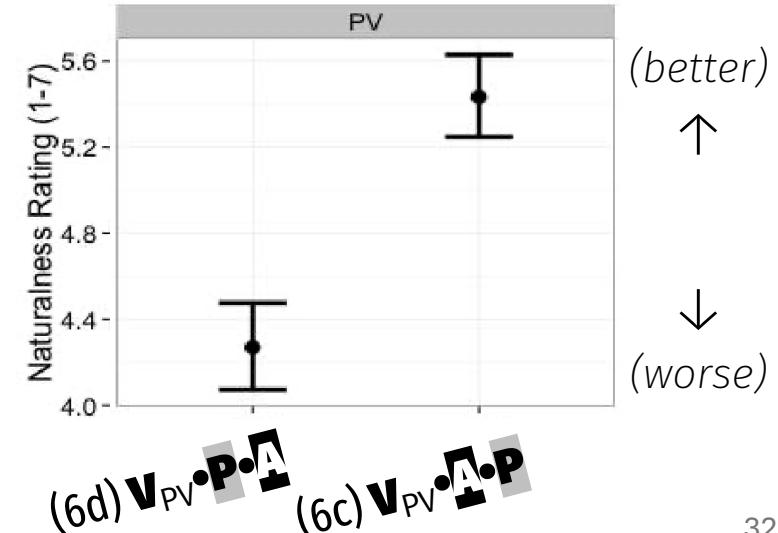
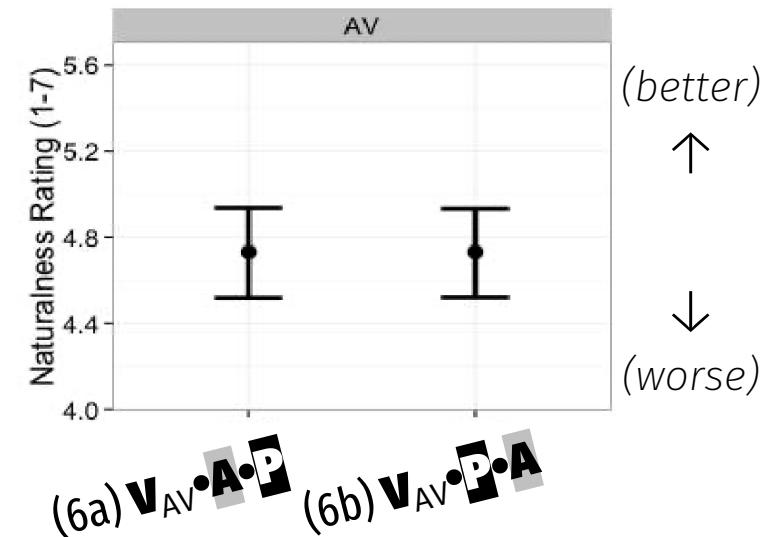
[Hsieh 2016]

	Verb	N1	N2	Condition
(6a)	<i>Pumatay</i> kill:AV	<i>ang balyena</i> ALPHA whale	<i>ng pating.</i> BETA shark	$V_{AV} \bullet A \bullet P$
(6b)	<i>Pumatay</i> kill:AV	<i>ng balyena</i> BETA whale	<i>ang pating.</i> ALPHA shark	$V_{AV} \bullet P \bullet A$
(6c)	<i>Pinatay</i> kill:PV	<i>ng balyena</i> BETA whale	<i>ang pating.</i> ALPHA shark	$V_{PV} \bullet A \bullet P$
(6d)	<i>Pinatay</i> kill:PV	<i>ang balyena</i> ALPHA whale	<i>ng pating.</i> BETA shark	$V_{PV} \bullet P \bullet A$

Processing Philippine Case

[Hsieh 2016]

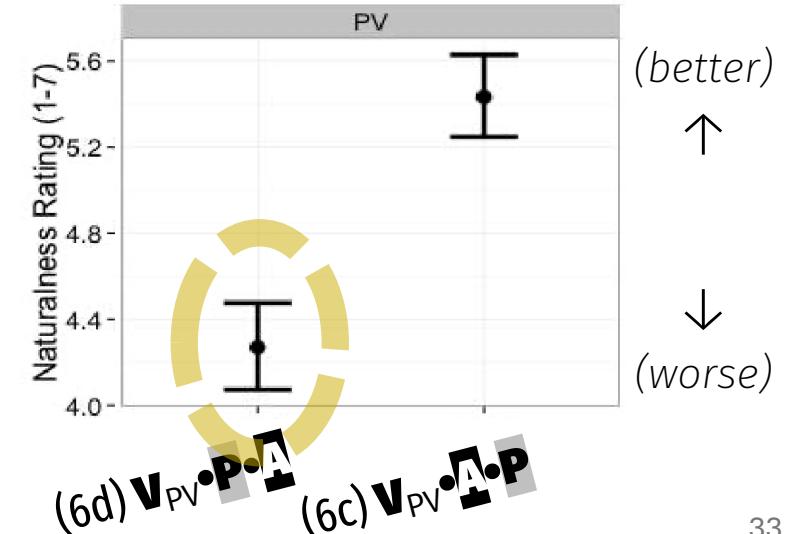
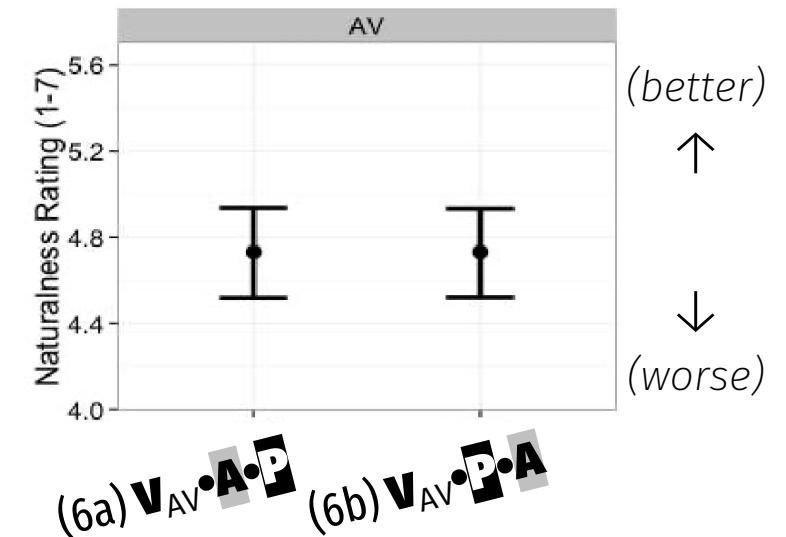
	Verb	N1	N2	Condition
(6a)	<i>Pumatay</i> kill:AV	<i>ang balyena</i> ALPHA whale	<i>ng pating.</i> BETA shark	$V_{AV} \bullet A \bullet P$
(6b)	<i>Pumatay</i> kill:AV	<i>ng balyena</i> BETA whale	<i>ang pating.</i> ALPHA shark	$V_{AV} \bullet P \bullet A$
(6c)	<i>Pinatay</i> kill:PV	<i>ng balyena</i> BETA whale	<i>ang pating.</i> ALPHA shark	$V_{PV} \bullet A \bullet P$
(6d)	<i>Pinatay</i> kill:PV	<i>ang balyena</i> ALPHA whale	<i>ng pating.</i> BETA shark	$V_{PV} \bullet P \bullet A$



Processing Philippine Case

[Hsieh 2016]

	Verb	N1	N2	Condition
(6a)	<i>Pumatay</i> kill:AV	<i>ang balyena</i> ALPHA whale	<i>ng pating.</i> BETA shark	$V_{AV} \bullet A \bullet P$
(6b)	<i>Pumatay</i> kill:AV	<i>ng balyena</i> BETA whale	<i>ang pating.</i> ALPHA shark	$V_{AV} \bullet P \bullet A$
(6c)	<i>Pinatay</i> kill:PV	<i>ng balyena</i> BETA whale	<i>ang pating.</i> ALPHA shark	$V_{PV} \bullet A \bullet P$
(6d)	<i>Pinatay</i> kill:PV	<i>ang balyena</i> ALPHA whale	<i>ng pating.</i> BETA shark	$V_{PV} \bullet P \bullet A$

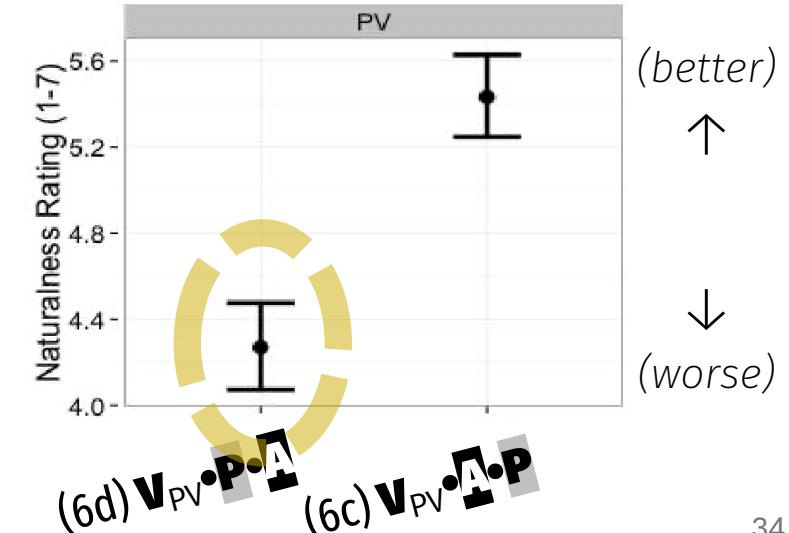
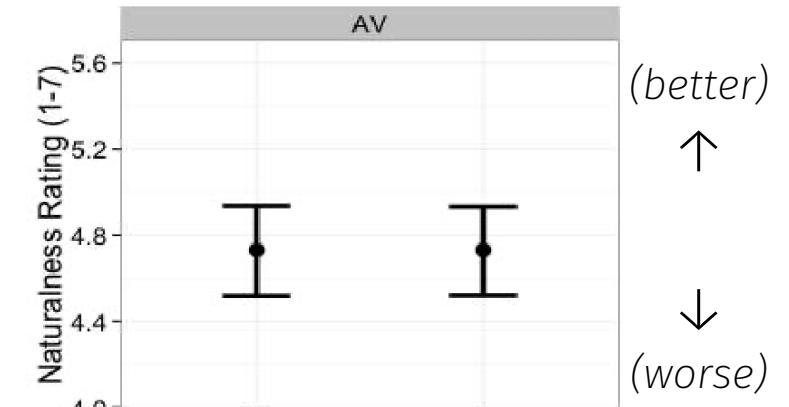


Processing Philippine Case

[Hsieh 2016]

Two interacting constraints

- **Agt-First & ALPHA-Last** [Kroeger 1993, Pizarro-Guevara & Garcia 2024]
- When neither is satisfied (6d), acceptability is degraded [Hsieh 2016] and RTs increase [Bondoc & Schafer 2022].



Processing Philippine Case

Whence Agt-First?

- Perhaps a deeply rooted fact about event perception [Bornkessel-Schlesewsky & Schlesewsky 2014; Sauppe et al. 2023]
- (Though note EA/IA asymmetries wrt VP interpretation [Marantz 1984])

Processing Philippine Case

Whence **Agt**-First?

- Perhaps a deeply rooted fact about event perception [Bornkessel-Schlesewsky & Schlesewsky 2014; Sauppe et al. 2023]
- (Though note EA/IA asymmetries wrt VP interpretation [Marantz 1984])

Whence **ALPHA**-Last?

- Reflects a high rightward structural position? [Guilfoyle et al. 1992]
- Crosslinguistic preference for topic-peripheral orders? [Herring 1990]
- Speculative: Because **ALPHA** is so entropic out-of-the-blue, **Verb+BETA** ensures the comprehender has maximal cues to disambiguate it.

Processing Reverse-Philippine Case

Processing
Tasks:

	<p><i>veʃap'-i/-s</i> whale-CASE</p> <p>N1</p> <p>[case: κ_1]</p>	
• Predict role		

Processing Reverse-Philippine Case

**Processing
Tasks:**

<p><i>veʃap'-i/-s</i> whale-CASE</p> <p>N1</p> <p>[case: κ_1]</p>	<p><i>zvigen-s/-i</i> shark-CASE</p> <p>N1</p> <p>[case: κ_2]</p>	
<ul style="list-style-type: none">• Predict role	<ul style="list-style-type: none">• Predict role	

Processing Reverse-Philippine Case

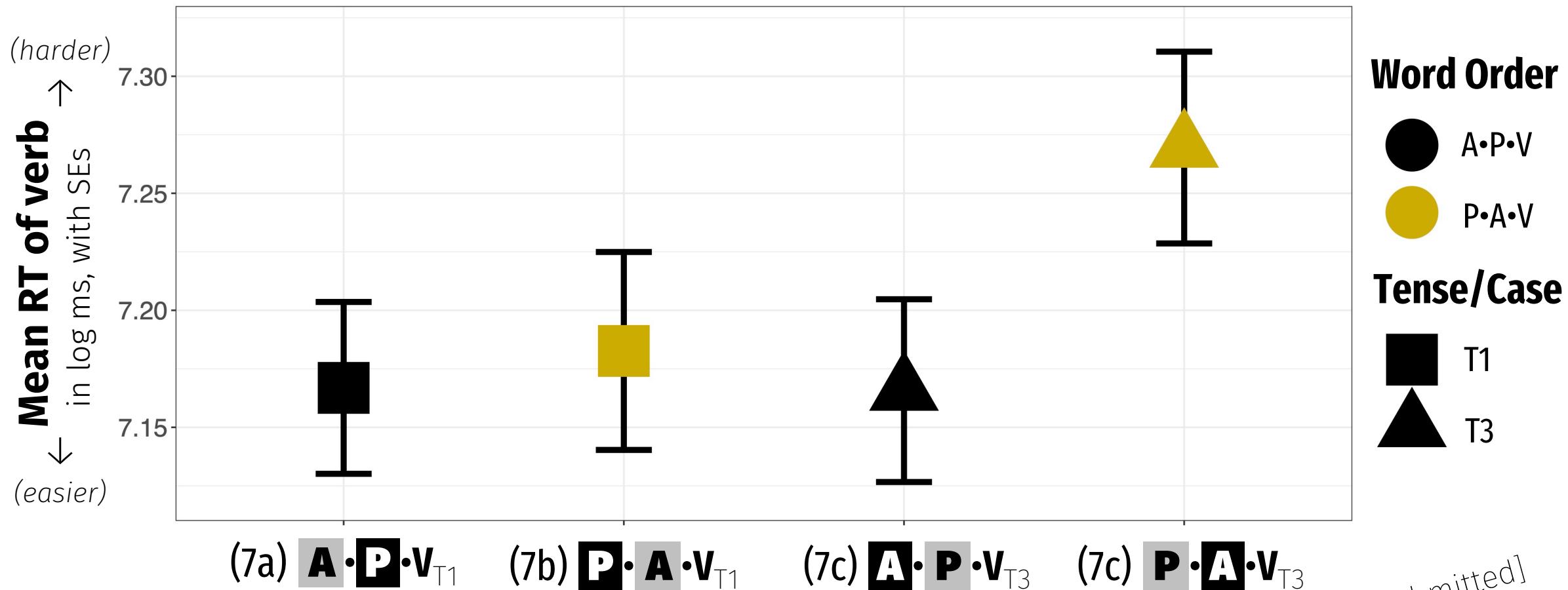
**Processing
Tasks:**

<p><i>veʃap'-i/-s</i> whale-CASE</p> <p>N1</p> <p>[<u>case</u>: κ_1]</p>	<p><i>zvigen-s/-i</i> shark-CASE</p> <p>N1</p> <p>[<u>case</u>: κ_2]</p>	<p><i>mok'lavs/</i> <i>mouk'lavs</i></p> <p>kill:TENSE</p> <p>Verb</p> <p>[<u>tense</u>: T1/T2]</p> <p>[<u>roles</u>: θ_1, θ_2]</p>
<ul style="list-style-type: none">Predict role	<ul style="list-style-type: none">Predict role	<ul style="list-style-type: none">Access lexical semanticsCalculate mappingRetrieve N1 & N2's caseIntegrate N1, N2, & V

Processing Reverse-Philippine Case

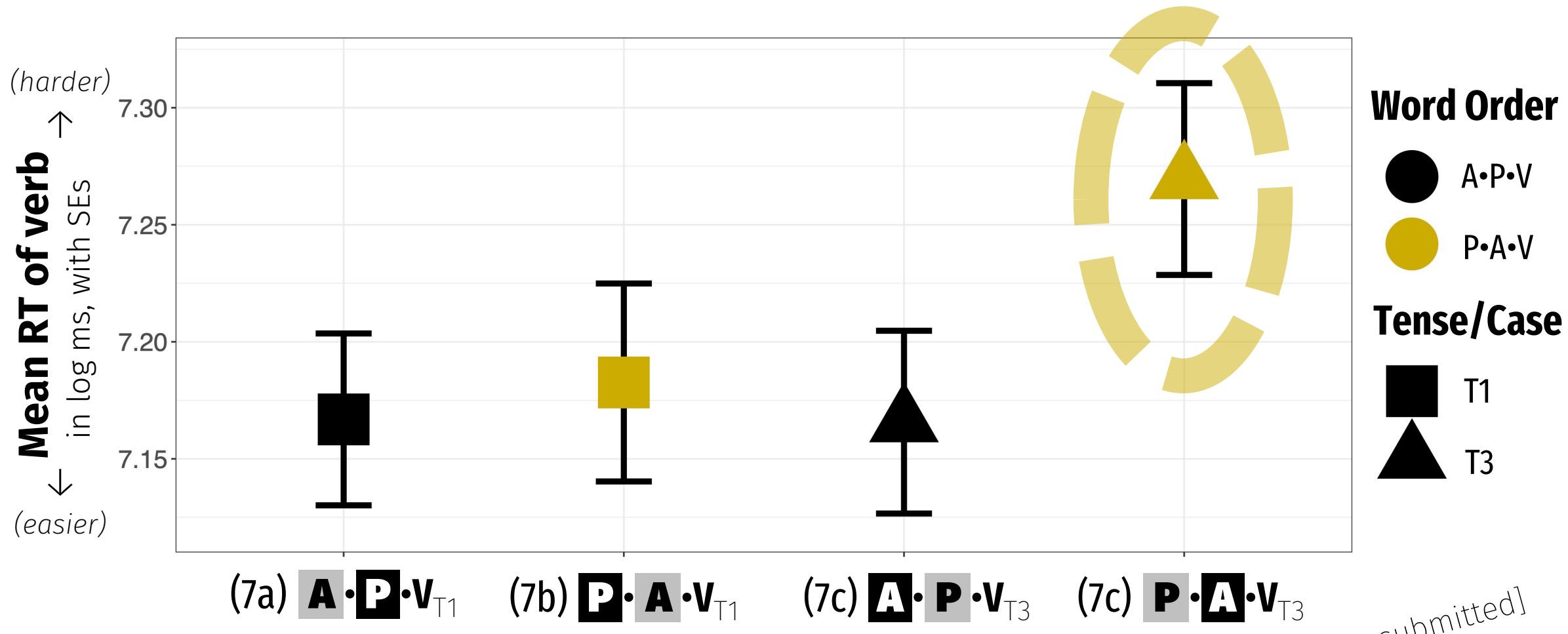
	N1	N2	Verb	Condition
(7a)	<i>veʃap'-i</i> whale- ALPHA	<i>zvigen-s</i> painter- BETA	<i>mok'lavs</i> kill:FUT	A•P•V_{T1}
(7b)	<i>veʃap'-s</i> whale- BETA	<i>zvigen-i</i> painter- ALPHA	<i>mok'lavs</i> kill:FUT	P•A•V_{T1}
(7c)	<i>veʃap'-s</i> whale- BETA	<i>zvigen-i</i> painter- ALPHA	<i>mouk'lavs</i> kill:PERF	A•P•V_{T3}
(7d)	<i>veʃap'-i</i> whale- ALPHA	<i>zvigen-s</i> painter- BETA	<i>mouk'lavs</i> kill:PERF	P•A•V_{T3}

Processing Reverse-Philippine Case



[Foley, submitted]

Processing Reverse-Philippine Case



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

[Foley, submitted]

Processing Reverse-Philippine Case

Generalization: another eerie parallel with Tagalog

- **Agt-First** interacts superadditively with **ALPHA-Last** (or a constraint that functions equivalently here) [cf. Skopeteas et al. 2011]
- i.e. $\mathbf{V}_{PV} \bullet \mathbf{P} \bullet \mathbf{A}$ (6d) is hard in Tagalog, and so is $\mathbf{P} \bullet \mathbf{A} \bullet \mathbf{V}_{T3}$ (7d) in Georgian!

Processing Reverse-Philippine Case

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A spurious connection?

- Maybe – syntactically, Georgian & Tagalog “**ALPHA**” are very different.
- Worth further investigation, since **ALPHA** nevertheless has the highest-entropy distribution in both languages.

Next steps for Comparative Psycholing

Tons of microvariation to take advantage of!

- **Comparative corpus research** to more accurately calculate for $H(r|k)$ across Austronesian – testing predictions of the Low Entropy Conj.

Leveraging low-entropy Philippine languages (e.g. Paiwan)

- Prediction: **ALPHA-Last** is even stronger, since inherent cases like **DELTA** are so informative.

Leveraging high-entropy Philippine languages (e.g. Tagalog)

- Prediction: **Agt-First** is even stronger in clauses with two **BETA** arguments (LV/CV/RPFV), since Agt & Pat are indistinguishable.

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Nutshell

Tagalog (V-initial)

	Agt	Pat	Obl
AV	ALPHA	BETA	GAMMA
PV	BETA	ALPHA	GAMMA
OV	BETA	BETA	ALPHA

Georgian (V-final)

	Agt	Pat	Obl
T1	ALPHA	BETA	BETA
T2	DELTA	ALPHA	BETA
T3	BETA	ALPHA	GAMMA

