

DESCRIBING AFFECT AND EPISTEME

A MIXED METHODOLOGY FOR THE STUDY OF EXPRESSIVE INTERJECTIONS

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Universitat Pompeu Fabra

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GLIF
Formal Linguistics
Research Group



GraC
Grammar & Cognition
Research Group

OUTLINE

- 1 PUCHA AND CHUTA: Two EI OF CHILEAN-SPANISH
- 2 LLM AND CONTEXTUAL-INFORMED ANNOTATION
- 3 WHAT INTERACTION TELLS US ABOUT SPEAKER'S ATTITUDES
- 4 RELATIONSHIP BETWEEN EMOTIVE AND EPISTEMIC STATES
- 5 DISCUSSION
- 6 CONCLUSIONS

OBJECT OF STUDY: EXPRESSIVE INTERJECTIONS IN CHILEAN SPANISH

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- Interjections have been described to be loosely integrated into the propositional structure of the utterance (Wilkins, 1992).
 - ▶ But are they actually?
- Despite their importance in interaction, little is known about these kind of particles (Ponsonnet, 2022; Dingemanse, 2023).

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- There's a need for a methodology to describe expressive interjections.
- Interjections are highly attached to the language's culture (Wierzbicka, 1992). An investigation on interjections must be, at first, culture-specific.

MOTIVATION

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- *pucha* and *chuta* are phonetically similar words that speakers use in very similar contexts to express similar content.
- Native speakers intuitively recognize that they are somehow different, though they don't know exactly why (Rivera, 2022).

pucha

chuta

MOTIVATION



Diccionario de americanismos

Escriba aquí la palabra

Q

áéíóúüñ

¡pucha! (Sinc. de *púchica*).

- I. 1. interj. *Ho, CR, Co, Ve, Ec, Pe, Bo, Ch, Py, Ar, Ur*. Expresa contrariedad, desagrado. euf; pop. (**¡a la pucha chel!**; **¡la pucha!**; **¡la gran pucha!**; **¡por la pucha!**; **¡pucha digo!**; **¡puchas**).

FIGURE: *pucha* in Dictionary of Americanisms

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FIGURE: *pucha* in Dictionary of Americanisms

Expresses annoyance, displeasure.

MOTIVATION



Viejo Perro Blanco 🕊 @ander_zavala · 21h

Ya en casa y como estropajo con el dolor 😵😭

Q 7

⤳

Heart 9

304

Bookmark Up

...



VanBass

@VBassaletti

...

Pucha, no sé qué tienes. Espero que sanes pronto y ya no sientas dolor.

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Pucha, no sé qué tienes. Espero que sanes pronto y ya no sientas dolor.

I: Already at home and I feel awful because of the pain.

R: **Pucha**, I don't know what you have. I hope you heal soon and no longer feel pain.

MOTIVATION



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¡chuta!

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FIGURE: *chuta* in Dictionary of Americanisms

MOTIVATION



ASOCIACIÓN DE ACADEMIAS DE LA
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FIGURE: *chuta* in Dictionary of Americanisms

Expresses surprise, anger or disappointment.

MOTIVATION



VICKY @chicadelosmixis · 20 nov.

Cuánto sale un electro cardiograma por Fonasa ????

Q 2



158



...



Jorgito ¿Sacó a los Ambulantes de Valpo? @Rominola · 20 nov.

El más simple como 10 Lucas

Q 1



57



...



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VICKY
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Chuta y sabes si una orden de hospital la puedo usar en privados???

I: How much does an electrocardiogram cost through Fonasa?

R: The simplest one costs like 10 bucks.

I: **Chuta**, and do you know if a hospital order can be used in private clinics?

AIM OF THIS STUDY

Our aim is to understand what is the meaning of these words, to define them in a way that acknowledges their differences and similarities and predicts their uses.

RESEARCH QUESTION

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- ① What is the emotive and epistemic content they express?

- ② How can be these words characterized using representations from LLM?

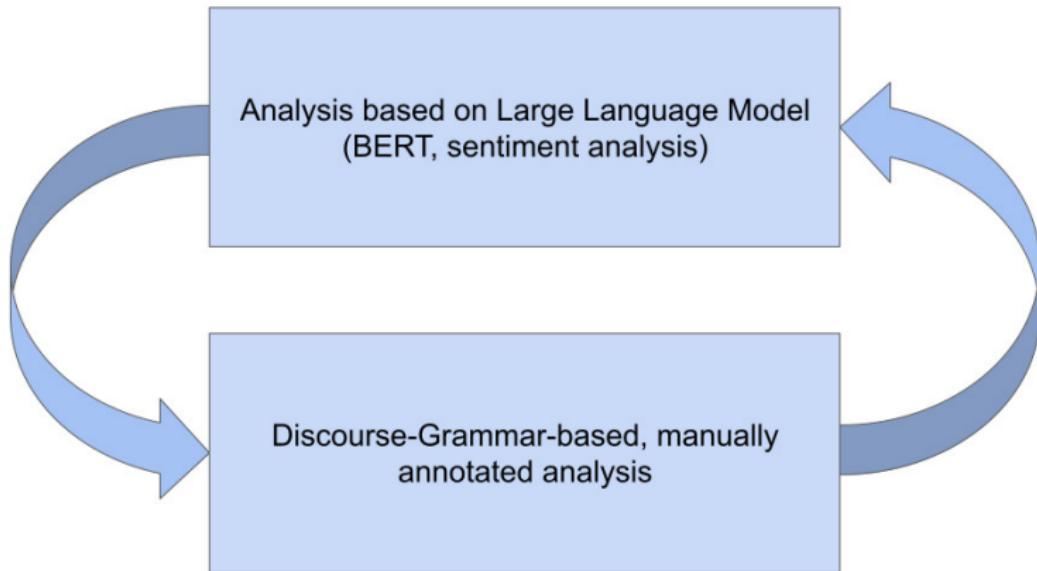
LLM AND CONTEXTUAL-INFORMED ANNOTATION

- Interjections are highly contextual. They evaluate information that is part of the common ground. In order to study them, we must collect the interactional context in which they are used.

LLM AND CONTEXTUAL-INFORMED ANNOTATION

- Interjections are highly contextual. They evaluate information that is part of the common ground. In order to study them, we must collect the interactional context in which they are used.
- We observed the use of these words in interaction creating a corpus from X (aka Twitter). We analyzed the data using manually-annotated labels and computational tools (LLM) that were mutually informed through the process.

FLOW DIAGRAM OF METHODOLOGY



DISTRIBUTION OF INTERJECTIONS

- Both interjections are used primarily as response to an initiation tweet. We observe that even stand-alone utterance either react to some contextual cue or perform a reaction.

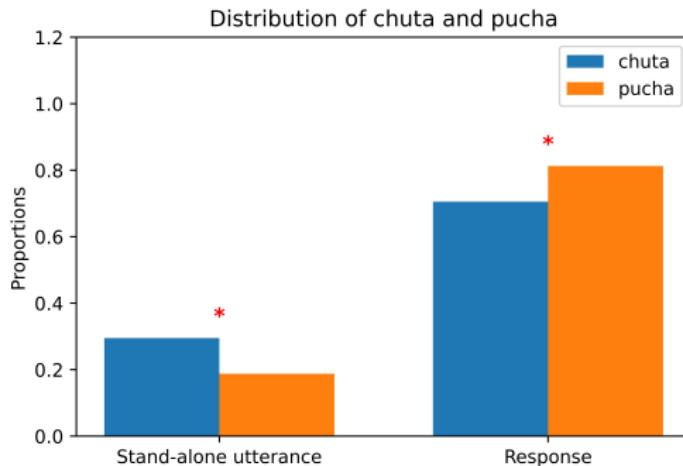
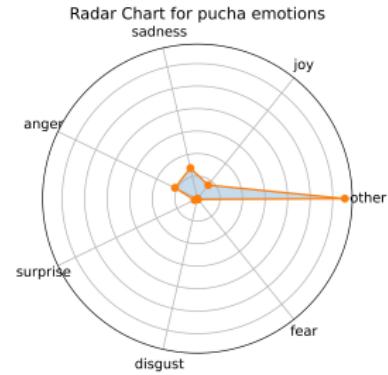
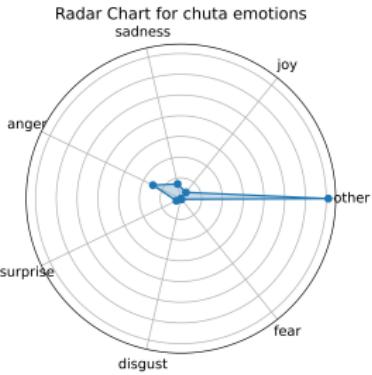


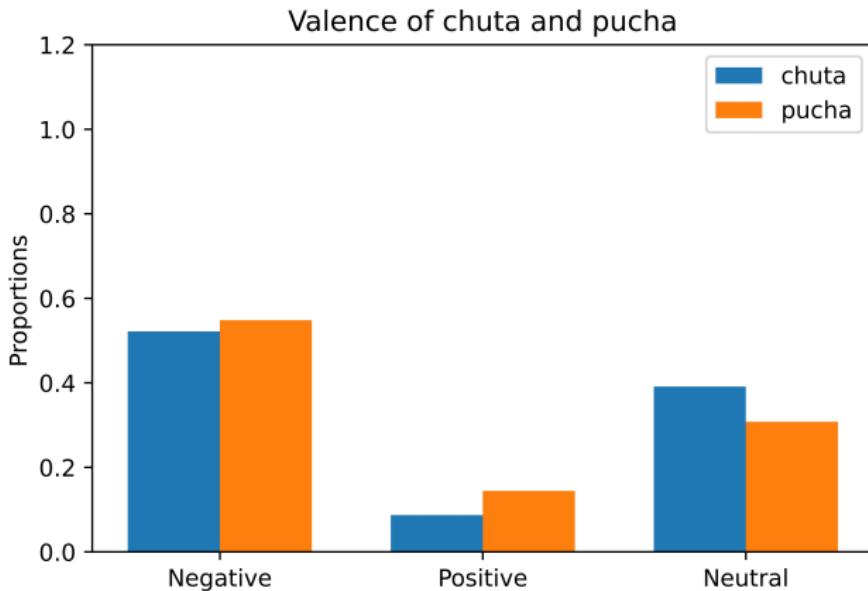
FIGURE: Chilean Corpus Twitter (2023)

EMOTIONS FROM SENTIMENT ANALYSIS



In *chuta* **76.9%** of the tweets are classified as other, followed by anger with **12.9%**. In *pucha* **59.8%** of the tweets are classified as other, followed by sadness with **22.7%** and anger with **9.1%**.

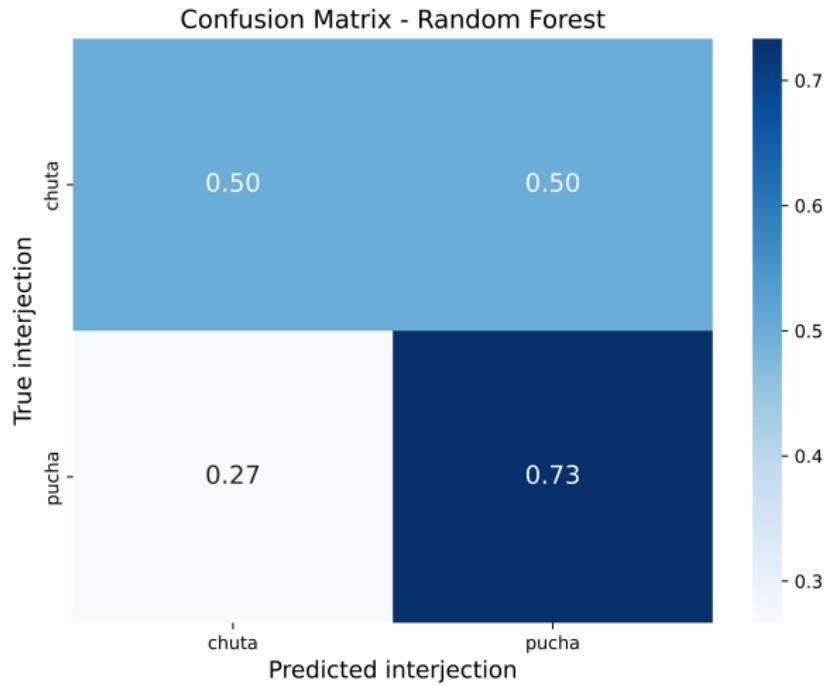
VALENCE CLASSIFICATION



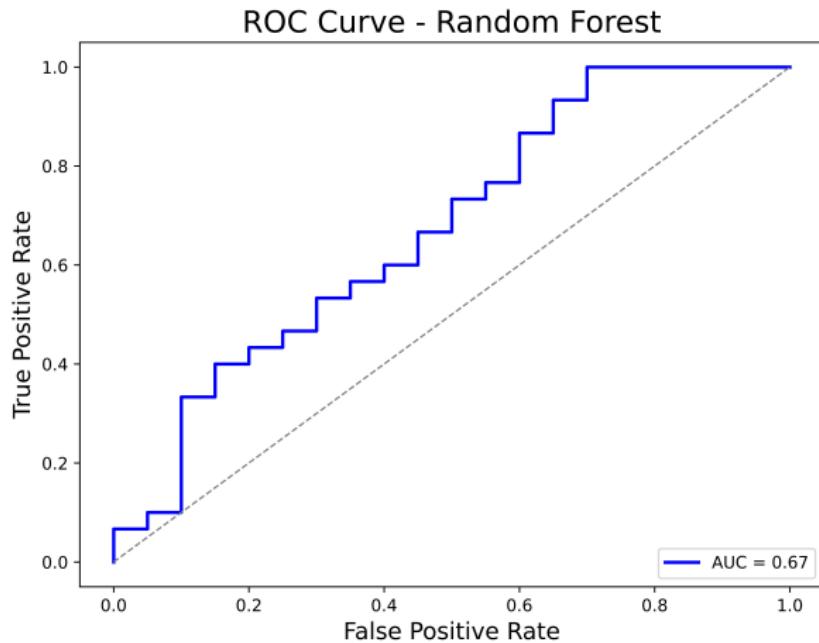
INTERJECTION CLASSIFICATION USING BERT

- We used a BERT model for Spanish to classify collected tweets containing one of both interjections.
- We used embeddings from BERT and masked both interjections. Then we train a Random Forest model (also Multi-Layer Perceptron (MLP) model) to classify the tweets containing one or the other interjection.

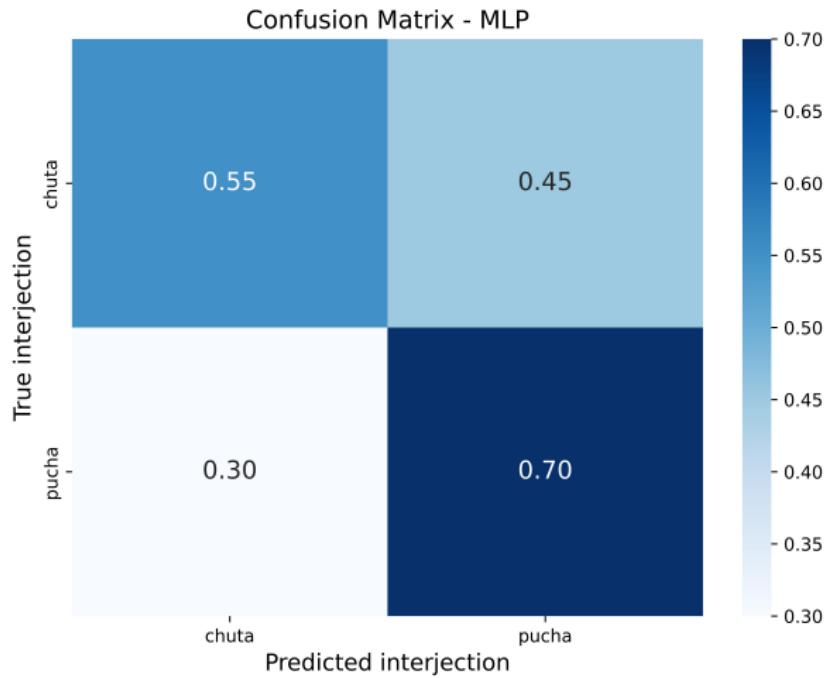
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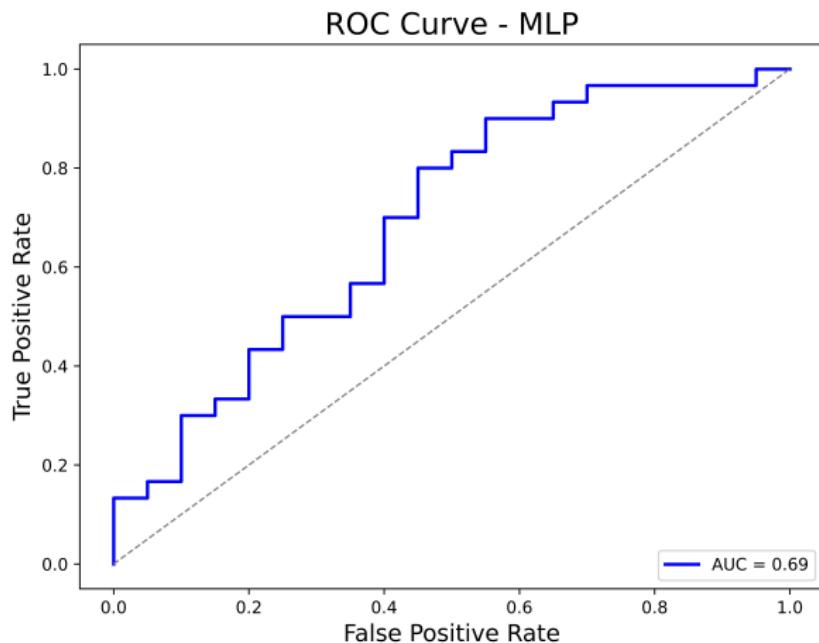
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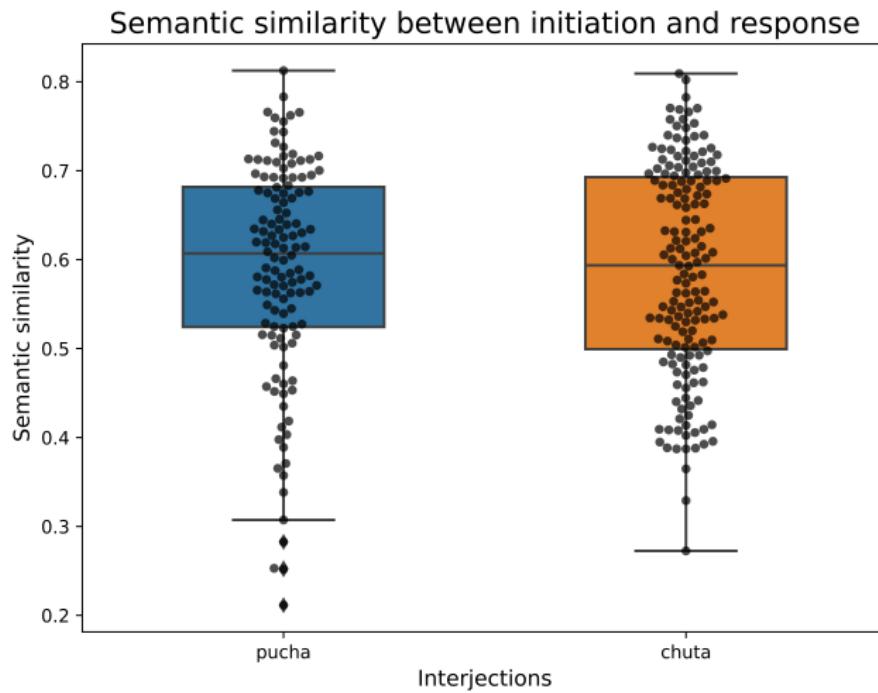


SEMANTIC SIMILARITY ANALYSIS

Semantic similarity between initiation and response tweets, where the interjection appears in the response.

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CATEGORIZATION (FROM SPEAKER'S PERSPECTIVE)

- They have similar distribution.
- Similar emotive value.
- Similar semantic distribution.
- How are they different?

CATEGORIZATION (FROM SPEAKER'S PERSPECTIVE)

CATEGORY	LABEL		
Action towards addressee's attitude	Affiliative	Disaffiliative	None
Agreement with addressee	Agrees	Disagrees	None
Hedonic valence	Positive	Negative	Neutral
Knowledge	Knows p beforehand	Didn't know p	Unavailable interpretation
Expectedness of p	Expected	Unexpected	Unavailable interpretation
Speaker's beliefs	Believes	Doesn't believe	Uncertain

Reference

- (Lindström & Sorjonen, 2013)
- (Sacks, 1987)
- (Feldman-Barret, 2011; Gasper et al., 2019)
- (Witschko, 2021)
- (Aikhenvaldt, 2012; Mellers et al., 2013)
- (Holmberg, 2011/2016)

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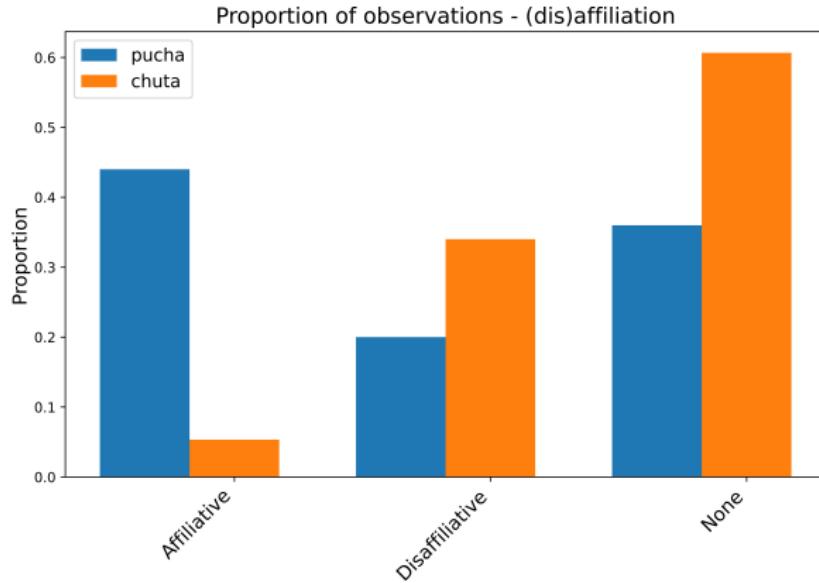
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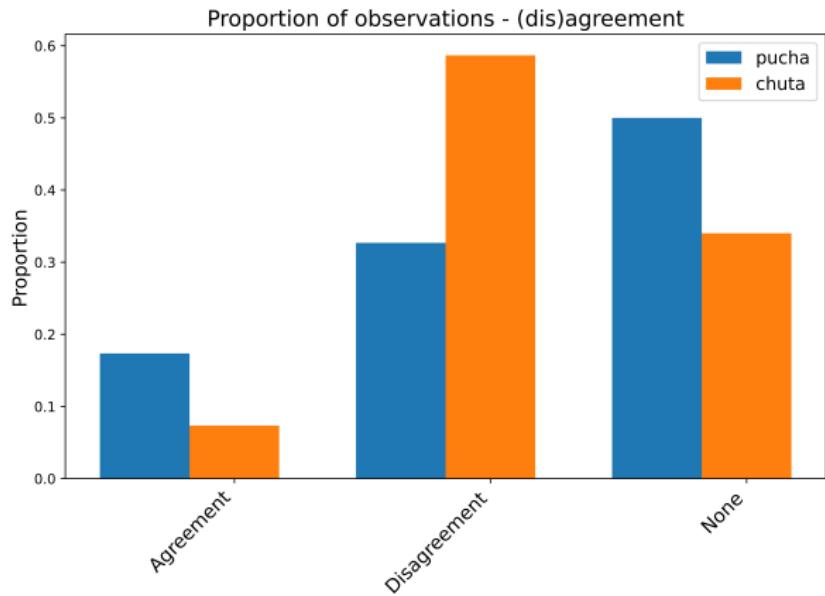
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- 79% occurrences of chuta and 98% of pucha have negative reading.
- 98% occurrences of chuta evaluate the proposition as unexpected. Only 21% occurrences of pucha have this reading.

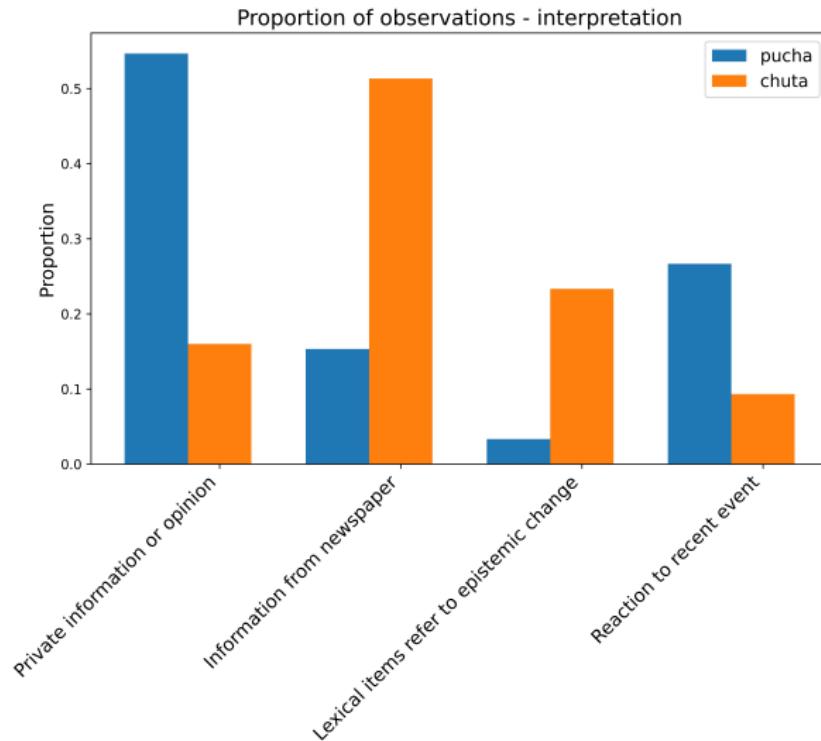
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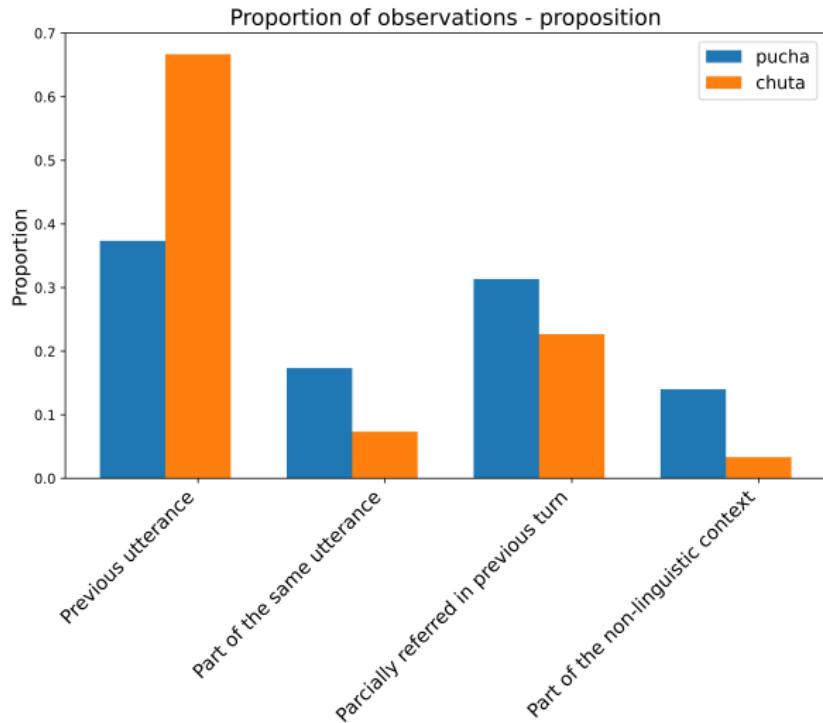
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INSIGHTS FROM THE ANALYSIS

- The (automatic and manual) analysis showed that *pucha* tends to be more emotive, while *chuta* tends to be more epistemic. Only the latter expresses an epistemic attitude of surprise.

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- The (automatic and manual) analysis showed that *pucha* tends to be more emotive, while *chuta* tends to be more epistemic. Only the latter expresses an epistemic attitude of surprise.
- This finding correlates with the idea that epistemic states are a necessary condition for the existence of emotive states (Mellers et al., 2013; Rett, 2021)

DISCUSSION

- These interactional particles under study work in the management of the common ground. They serve to acknowledge that the proposition that is shared in interaction was not part of the speaker's ground (beliefs, desires, knowledge) (Wiltschko, 2021).

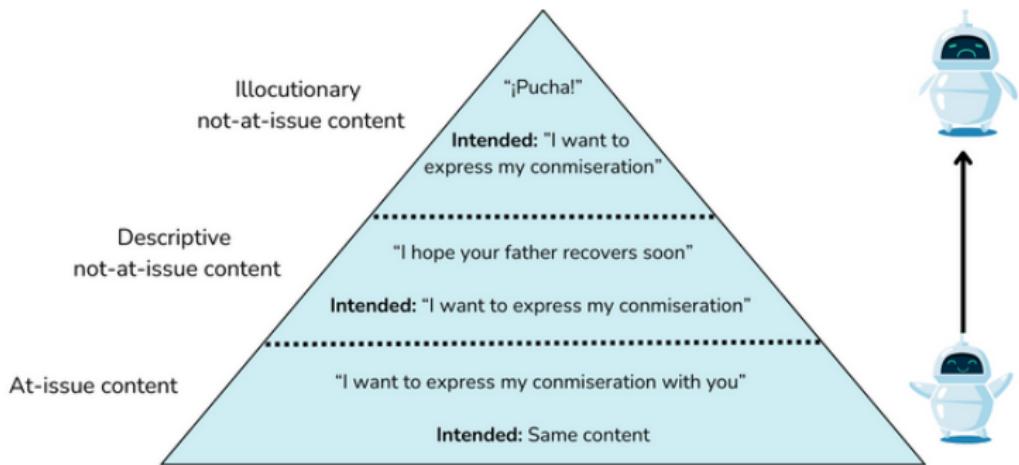
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- Expressive Intejections express culturally specific content that is not textual. This may explain why the manual annotation found differences that the model failed to capture.

DISCUSSION: LEVELS OF SEMANTIC MEANING



CONCLUSIONS

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- ③ Computational tools like LLM only can capture part of the (epistemic, emotive) meaning, specially when high contextual cues are involved.
- ④ The methodology is applicable to any other language, as the labels are motivated by cross-linguistic evidence. Nonetheless, the analysis of such labels must be cultural-specific.

LIMITATIONS

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Elon Musk
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To address extreme levels of data scraping & system manipulation, we've applied the following temporary limits:

- Verified accounts are limited to reading 6000 posts/day
- Unverified accounts to 600 posts/day
- New unverified accounts to 300/day

1:01 PM · Jul 1, 2023



FUTURE DIRECTIONS

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- ④ Use of generative models (like GPT) to observe how they would use different interjections.
- ⑤ Use linguistic data to model possible hierarchies between epistemic states and emotive states.

THANK YOU

Thank you for your attention.

ACKNOWLEDGEMENTS

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