

THIRD INTERNATIONAL CONFERENCE **PROMINENCE IN LANGUAGE**

KEYNOTE SPEAKERS

AMALIA ARVANITI

Radboud University Nijmegen

The trouble with prominence

DALE BARR

University of Glasgow

Perspective-taking and its impostors in language use

**02-03
JUNE
2022**

DEJAN MATIĆ

University of Münster

**Prominence and
information structure**

Date 02-03 June 2022

Venue AMERON Köln. Hotel Regent
Melatengürtel 15 | 50933 Cologne | Germany

Organizing committee Sophie Repp | Jakob Egetenmeyer
Haydar Batuhan Yildiz | Maria Lialiou

The Prominence Conference is hosted by
the Collaborative Research Center Prominence in Language (SFB 1252)
and the Cologne Center of Language Sciences (CCLS).



Contact prominence-conference-3@uni-koeln.de
Registration <https://sfb1252.uni-koeln.de/icpl-iii-2022>
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CCLS
COLOGNE CENTER OF LANGUAGE SCIENCES



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Conference Program

3rd International Conference 'Prominence in Language'

Conference Program

2-3 June 2022
University of Cologne

Venue

AMERON Köln. Hotel Regent
Melatengürtel 15 | 50933 Cologne
<https://ameroncollection.com/en/koeln-hotel-regent>

1 June – Wednesday

19:00 Warm-Up: Restaurant Oasis (<https://www.restaurantoasis.de>)

2 June – Thursday

08:00 - 09:00 Registration

09:05 - 09:30 **Welcome**

Prof. Dr. Bettina Rockenbach

Vice-Rector for Research and Innovation, *University of Cologne*

Prof. Dr. Stefan Grohé

Dean of the Faculty of Arts and Humanities, *University of Cologne*

Prof. Dr. Petra Schumacher

Speaker of the CRC 1252 'Prominence in Language', *University of Cologne*

SESSION I

09:30 – 10:30 **Invited Speaker: Amalia Arvaniti**
Radboud University
The trouble with Prominence

10:30 – 11:00 Coffee break

SESSION II

11:00 – 11:30 **Katrina Kechun Li, Francis Nolan, and Brechtje Post**
University of Cambridge
Variations of focus prominence in three tone languages

11:30 – 12:00 **Pingping Jia and Judith Meinschaefer**
Free University of Berlin
The interaction of tonal and metrical prominence in the Pingding dialect of Chinese

12:00 – 12:30 **Maria Lialiou¹, Aviad Albert¹, Alexandra Vella², and Martine Grice¹**
University of Cologne¹, University of Malta²
Prominence at edges? Some evidence from Maltese wh-words using periodic energy

12:30 – 14:00 **LUNCH**

SESSION III

14:00 – 14:30 **Lena Borise¹, Andreas Schmidt², and Balazs Suranyi¹**
Hungarian Research Centre for Linguistics¹, University of Potsdam²
Preverbal foci are syntactically disparate but prosodically uniform

14:30 – 15:00 **Volker Struckmeier**
Ruhr University Bochum
Discourse prominence relations as an explanation for semantic reconstruction under ellipsis

15:00 – 15:30 **Anna Pia Jordan-Bertinelli¹, Christopher Saure², and Stefan Hinterwimmer²**
University of Witwatersrand¹, University of Wuppertal²
An experimental investigation of the interaction of narrators' and protagonists' perspectival prominence in narrative texts

SESSION IV + COFFEE

15:30 – 17:00 **POSTER SESSION I**

SESSION V

17:00 – 18:00 **Invited Speaker: Dejan Matić**
University of Münster
Prominence and information structure

19:00 **CONFERENCE DINNER**
Restaurant: Zum Alten Brauhaus (www.brauhaus-suedstadt.de)

3 June – Friday

SESSION VI

09:00 – 09:30 **Lena Pagel, Simon Roessig, and Doris Mücke**
University of Cologne
Articulatory encoding of prominence in habitual and loud speech

09:30 – 10:00 **Christine Prechtel**
University of California
Testing the inverse relationship between lexical stress strength and macro-rhythm strength

SESSION VII + COFFEE

10:00 – 11:30 **POSTER SESSION II**

SESSION VIII

11:30 – 12:00 **Sebastian Sauppe¹, Arrate Isasi-Isasmendi¹, Caroline Andrews¹, Åshild Næss², Moritz M. Daum¹, Monique Flecken³, Itziar Laka⁴, Martin Meyer¹, and Balthasar Bickel¹**
University of Zurich¹, University of Oslo², University of Amsterdam³, University of Basque Country⁴

The prominence of agents in event cognition and language processing: Reviewing the cross-linguistic evidence for a malleable preference

12:00 – 12:30 **Christopher Hammerly¹, Adrian Staub², and Brian Dillon²**
University of British Columbia¹, University of Massachusetts²
Prominence guides incremental interpretation: Lessons from obviation in Ojibwe

12:30 – 14:00 **LUNCH**

SESSION IX

- 14:00 – 14:30 **Paul Compensis and Petra B. Schumacher**
University of Cologne
Marking discourse prominence or marking a shift in attention? The case of Bulgarian differential object indexing
- 14:30 – 15:00 **Nehir Aygül, Yvonne Portele, and Markus Bader**
Goethe University
Separating thematic role effects from structural prominence effects: a comparison of Turkish and German pronouns
- 15:00 – 15:30 **Duygu Özge¹, Ebru Evcen², and Joshua Hartshorne³**
Middle East Technical University¹, University of California San Diego², Boston College³
Implicit causality biases in Turkish psychological state events
- 15:30 – 16:00 **COFFEE BREAK**

SESSION X

- 16:00 – 16:30 **Umesh Patil¹, Stefan Hinterwimmer², and Petra B. Schumacher¹**
University of Cologne¹, University of Wuppertal²
Evaluative expressions influence prominence: effects on *die* and *diese* pronouns
- 16:30 – 17:30 **Invited Speaker: Dale Barr**
University of Glasgow
Perspective-taking and its impostors in language use
- 17:30 – 17:45 Closing remarks

Poster sessions
see next four pages

2 June – Thursday

POSTER SESSION I

15:30 - 17:00

[1] Aviad Albert, Maria Lialiou, Simona Sbranna, and Francesco Cangemi
University of Cologne
Improved acoustic characterization of prosodic prominence using periodic energy mass

[2] Simon Roessig, Janne Lorenzen, and Stefan Baumann
University of Cologne
Evidence for a prosodic prominence budget in German utterances

[3] Enkeleida Kapia¹, Felicitas Kleber¹, and Alejna Brugos²
Institute for Phonetics and Speech Processing¹, Massachusetts Institute of Technology²
Discrete and continuous-valued prosodic cues to prominence perception in Albanian

[4] Christine T. Röhr¹, Michelina Savino², T. Mark Ellison¹, and Martine Grice¹
University of Cologne¹, University of Bari²
The role of intonation in attention allocation in serial recall

[5] Ricardo Napoleão de Souza¹ and Maria Cantoni²
University of Helsinki¹, Federal University of Minas Gerais²
An evaluation of secondary prominence in spontaneous Brazilian Portuguese

[6] Sarah Dolscheid¹, Judith Schlenker², Barbara Zeyer¹, and Martina Penke¹
University of Cologne¹, Arctic University of Norway²
How animacy and literacy affect picture naming

[7] Maria Bardají i Farré, Semra Kizilkaya, Sonja Riesberg, and Nikolaus P. Himmelmann
University of Cologne
Some natural forces are animate agents

[8] Lidia Federica Mazzitelli
University of Cologne
Animacy as a prominence-lending feature in Lakurumau

[9] Åshild Næss
University of Oslo
Prominence levels and the symmetrical voice-to-transitivity shift

[10] Yvonne Portele
Goethe University
Patient prominence in German: Effects of accessibility and structural priming

[11] Thiago Bruno de Souza Santos, Stella von Randow-Jopen, Antonia Dietrich, and Pamela Perniss

University of Cologne

Marking prominence in German Sign Language (DGS): A corpus analysis of object marking with the sign AUF

[12] Jakob Egetenmeyer

University of Cologne

The varying prominence status of indirect speech in adversative contexts

3 June – Friday
POSTER SESSION II

10:00 - 11:30

[1] Kirsten Culhane

University of Freiburg

Examining acoustic evidence for word-level prosodic prominence in Waima'a

[2] Isabelle Franz¹, Christine Knoop¹, Gerrit Kentner², Sascha Rothbart¹, Vanessa Kegel¹, Julia Vasilieva¹, Sanja Methner¹, Mathias Scharinger¹, and Winfried Menninghaus¹

Max Planck Institute for Empirical Aesthetics¹, Goethe University²

Prosodic phrasing and syllable prominence in spoken prose – prediction from text and validation

[3] Alicia Janz, Simon Wehrle, and Simona Sbranna

University of Cologne

Making conversation work: Prominence in the intonation of feedback signals

[4] Heiko Seeliger and Sophie Repp

University of Cologne

Don't make me more prominent! Or do? Prosodic reflexes of contrast, newness and givenness in wh-exclamatives and wh-questions

[5] Christina Domene Moreno, Baris Kabak, and Haykanush Sazhumyan

University of Würzburg

Crosslinguistic differences in the mapping of prominence between music and language

[6] Yibing Shi

University of Cambridge

Corrective focus and tone sandhi in Xiangshan Wu Chinese

[7] Sandra Debreslioska¹ and Pamela Perniss²

Lund University¹, University of Cologne²

Gestures accompany new and focused referents in discourse

[8] Magdalena Repp, Petra B. Schumacher, and Clare Patterson

University of Cologne

Prominent protagonists influence discourse topicality

[9] Baris Kabak¹ and Janne Lorenzen²

University of Würzburg¹, University of Cologne²

Grammar-external and structural factors predict the rate of forestressing in African American English: A corpus study

[10] Timo Buchholz¹, Jet Hoek², and Klaus von Heusinger¹

University of Cologne¹, Radboud University²

Syntactic and prosodic cues for prominent clauses

[11] Tiago Augusto Duarte, Marco García García, and Klaus von Heusinger

University of Cologne

Differential Object Marking and discourse prominence in Spanish

[12] Albert Wall¹, Senta Zeugin², and Philipp Obrist²

University of Vienna¹, University of Zurich²

Experimental evidence from Ibero-Romance for fine-grained distinctions on prominence scales

[13] T. Mark Ellison

University of Cologne

Prominence facilitates communication between predictive agents

Abstracts of Invited Talks

The trouble with prominence
Amalia Arvaniti
CLS, Radboud University, Netherlands

In this talk, I will provide a critical review of the concept of prominence. First, I will show how theoretical developments in the mid-twentieth century led to the replacement of “stress” by utterance-level “prominence”. Further, I will review evidence about the role played by acoustic parameters (especially F0) and intuitions largely based on West Germanic languages in shaping our current understanding of what prominence is and how it should be studied. Finally, I will discuss recent findings which point to important differences between languages and propose a way of accommodating these in a theory of word stress and sentence prominence based on metrical abstractions, contending that this alternative conceptualization would allow us to disentangle acoustic salience from phonological relationships of metrical strength.

Perspective-taking and its impostors in language use

Dale Barr

University of Glasgow

What does it mean to "take another's perspective"? How do we determine whether the cognitive operations underlying certain behaviors, such as those underlying the linguistic marking of prominence, involve attributing and reasoning about mental states? In this talk I will distinguish four non-mentalistic types of cognitive processing that can give rise to behavior that is often mistaken for genuine perspective taking, as personified by: The Double (using one's own perspective as a proxy); The Charlatan (attribute substitution); The Conspirator (parallel operation of functionally independent processes); and The Freeloader (offloading cognitive computation to social interaction). The broad array of evidence for these patterns suggest that much of what is typically counted as social reasoning may in fact be accomplished through an ad hoc set of low-level cognitive heuristics.

Prominence and information structure

Dejan Matic

University of Münster

A wide-spread belief has it that sentences are partitioned into information-structural segments and that these segments have discrete denotations or at least carry discrete contributions to sentence interpretation. It is also commonly assumed that each of the segments (topic, comment, background, focus, etc.) is positively or negatively correlated to prominence. This talk will be an attempt to deconstruct the notions of information structure and reanalyse the assumed means of expressing it as various types of prominence bearers that receive their specific interpretations through an interplay of contextual clues, world knowledge and micro-conventionalisations.

Talk and Poster Abstracts

The abstracts are ordered by surname of first author

Improved acoustic characterization of prosodic prominence using periodic energy *mass*

Aviad Albert, Maria Lialiou, Simona Sbranna and Francesco Cangemi

University of Cologne

Since Fry's seminal papers on stress (e.g. Fry 1955), the main acoustic cues to prominence in phonetics and phonology have traditionally included both *acoustic intensity* and *duration* as two separate dimensions of prosodic *quantity*. This aspect of prosodic quantity plays a role both in lexical prominence, such as word stress (see overview in Gordon & Roettger 2017) and post-lexical prominence, such as intonational pitch accents (see Baumann & Winter 2018).

Selection: Instead of measuring the intensity of the acoustic signal we suggest a more selective approach in which we measure the *periodic energy* of the signal to reflect the strength of vocalic (voiced) components of speech, excluding voiceless aperiodic components. A measurement of periodic energy relates to pitch intelligibility in perception (House 1990), and is commensurate with functional accounts of syllables as pitch-bearing units, whereby periodic energy can be directly linked with *sonority* (Albert & Nicenboim 2020). Crucially, the periodic energy of speech favors the contribution of harmonic *periodic* components that carry pitch and characterize vocalic elements in the syllabic nuclei, over noisy *aperiodic* components that characterize consonantal portions in the syllabic margins.

Integration: We suggest further that acoustic power and duration should be integrated when attempting to quantify perceived prosodic strength. This can be restated in terms of the problem of measuring power from time series within intervals, essentially asking the following questions: should we track the highest/lowest peak, should we calculate the mean value, or should we sum over the duration of the interval? Those three alternatives differ in how they incorporate time into the measurement of power. Only the latter—summing—truly considers the contribution of time in the perception of quantity (see Turk & Sawusch 1997, Gordon 2004 on the integration of duration and power in prominence, and see Price 1980 on duration effects in perception of sonority). We adopt the summing approach by measuring the area under the periodic energy curve. We term this measurement *mass*.

The integration of power and duration into a single *mass* scale does not mean that language systems and individuals cannot differ in the extent to which they exploit specific aspects of quantity (e.g. increasing duration rather than intensity to enhance prosodic strength). Exploration of these two quantitative dimensions in isolation remains accessible and interesting as before. Mass measurements simply add the integrated quantitative view of prosodic strength, which has been neglected in standard accounts.

Plan: We present methods for obtaining periodic energy and mass measurements using the *ProPer* toolbox Albert et al. 2020, as Figure 1 illustrates. We demonstrate the usefulness of mass measurements with real experimental data from two recent studies: a study of Maltese wh-constructions (Lialiou et al. 2021) and a study on the L2 German intonation of Italian speakers (Sbranna et al. 2021). Maltese speakers exhibit a consistent increase in prosodic strength in locations of stress and focus, while only moderately increasing the strength of unstressed tone-bearing syllables (see Figure 2). In Figure 3, Italian learners of German deaccentuate both given and new information, whereas German speakers deaccentuate only given information and L1 Italian speakers do not deaccentuate at all. In both studies, aggregated mass measurements reveal distinct behaviors that might have otherwise been missed.

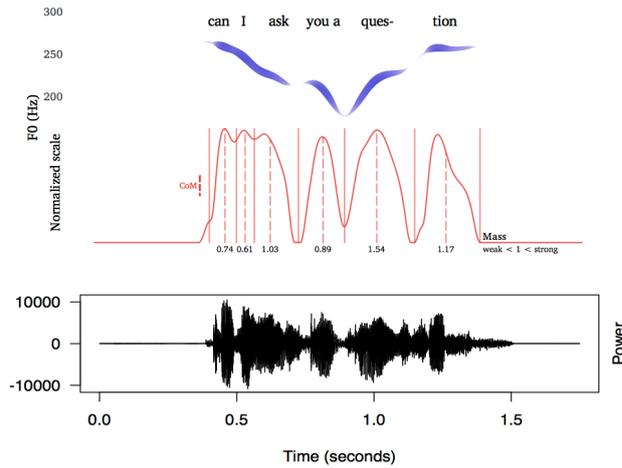


Figure 1 (left). Speech example from the *ProPer* toolbox: Periodic energy plotted in the red curve in the middle, time aligned with the F0 curve in blue at the top and the waveform in black at the bottom. Normalized mass values under the red curve reflect the area under the periodic energy curve within syllabic intervals, between solid vertical boundary lines. Dashed red lines within intervals denote the Center of Mass (CoM). Mass values above 1 reflect a strong syllable. Values below 1 reflect weak syllables.

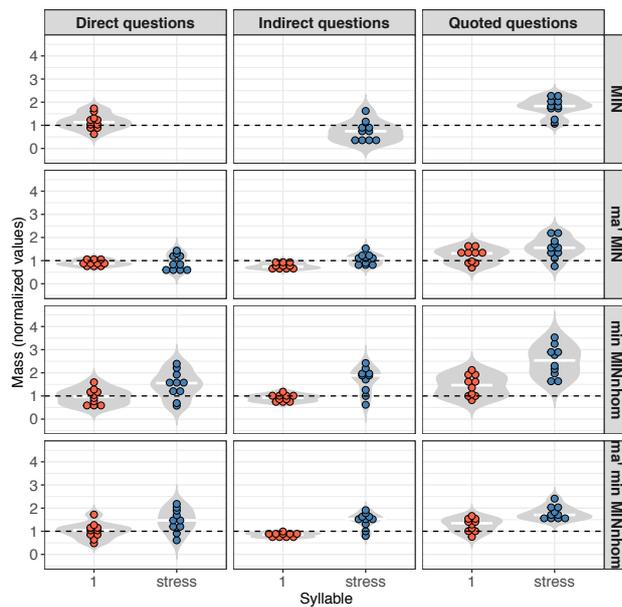


Figure 2 (left). Aggregated mass values of Maltese speakers. Blue data points depict stressed syllables in wh-words of varying size (rows) and type (columns). Red data points depict the initial syllable of the wh-word, which carries a tone in "Direct questions" (left panels) but not in the other modalities: "Indirect questions" in the middle and narrowly focused "Quoted questions" on the right. Data taken from Lialiou et al. (2021).

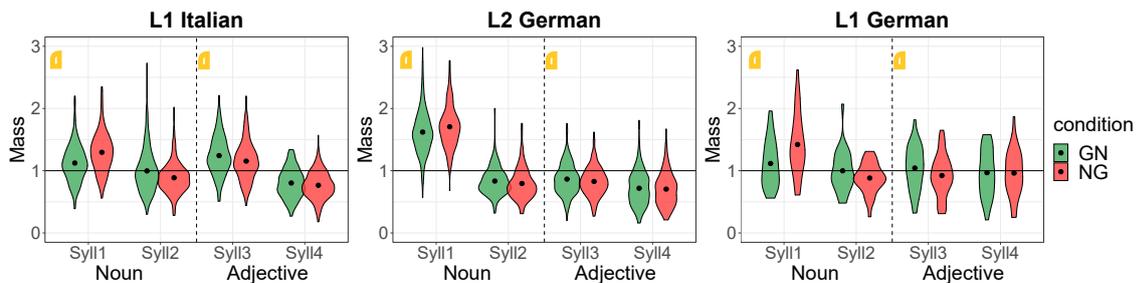


Figure 3 (bottom). Aggregated mass values comparing Italian and German speakers uttering noun-adjective pairs in two conditions: given-new in green (GN) vs. new-given in red (NG). Deaccentuation patterns are observed between the stressed syllables (in orange frames) by comparing syll3 to syll1. Data taken from Sbranna et al. (2021).

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- Sbranna, S., Ventura, C., Albert, A., & Grice, M. (2021). Developing prosodic competence: Marking information status in L2 German. In *TAI*. Sonderborg, Denmark [poster presentation].
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**Separating thematic role effects from structural prominence effects:
a comparison of Turkish and German pronouns**

Nehir Aygül, Yvonne Portele & Markus Bader
Goethe University Frankfurt

We investigate pronoun resolution in Turkish (pro-drop) and German (non pro-drop). Thematic roles were manipulated by using different *transfer of possession* (ToP) verbs (1).

- (1) a. **Get-type** (Recipient–Agent): Peter got a book from Mary.
b. **Give-type** (Agent–Recipient): Mary gave Peter a book.

Prior research has shown that the position of expressions within the referential hierarchy (see (2); e.g., Ariel, 1990; Gundel et al., 1993) correlates with discourse properties of its antecedent: the more reduced the form (left) the more prominent its antecedent.

- (2) **Referential hierarchy** (short): null pronoun > pronoun > demonstrative > full NP

We investigated Turkish null pronouns and overt p(ersonal)-pronouns and German p(ersonal)-pronouns and d(emonstratives)-pronouns. Turkish null pronouns and German p-pronouns are at the top of the referential hierarchy in their respective language and refer back to prominent referents (e.g., Turan, 1996; Bosch et al., 2003). Turkish p-pronouns and German d-pronouns come next on the referential hierarchy in each language and are used for less prominent referents (e.g., Enç, 1986; Bosch et al., 2003). This suggests the following correspondences: (i) Turkish null pronouns ~ German p-pronouns; (ii) Turkish p-pronouns ~ German d-pronouns.

The first major aim of our experiments was to test whether these correspondences indeed hold. Our second main aim was to test whether the interpretation of the different pronouns is affected by thematic and structural factors in similar ways, suggesting a single notion of prominence.

Table 1: Materials and method

German Experiment	Turkish Experiment
<i>Context</i>	<i>Context</i>
Give-type (Agent–Recipient): Jonathan hat Henri ein Halstuch gegeben. <i>Jonathan gave Henri a scarf.</i>	Give-type (Agent–Recipient): Koray Canberk’e bir atkı verdi. <i>Koray gave Canberk a scarf.</i>
Get-type (Recipient–Agent): Maja hat von Luisa ein Ei bekommen. <i>Maja got an egg from Luisa.</i>	Get-type (Recipient–Agent): Ayşe Melike’den iki yumurta aldı. <i>Ayşe got two eggs from Melike.</i>
<i>Prompt:</i>	<i>Prompt:</i>
No-pronoun: _____	No-pronoun: _____
p-pronoun: Er/Sie _____	p-pronoun: O _____
d-pronoun: Der/Die _____	null pronoun: [ÖZNE YOK] _____
	<small>(explicit prompt participants were familiarized with)</small>
<hr/> Method	<hr/> Method
<ul style="list-style-type: none"> • 39 native speakers of German • 30 sentences • Written sentence/text continuation 	<ul style="list-style-type: none"> • 30 native speakers of Turkish • 30 sentences • Written sentence/text continuation

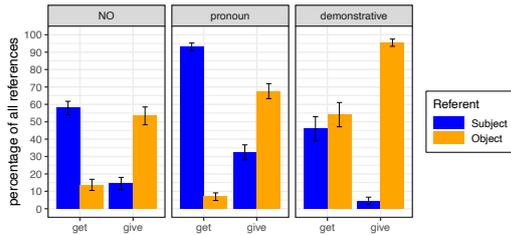


Figure 1: References for the three prompts in German.¹

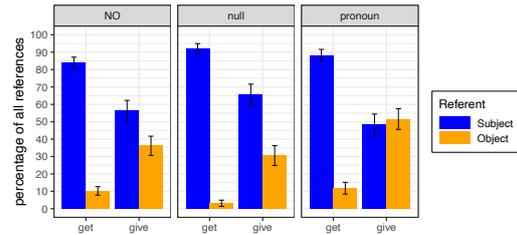


Figure 2: References for the three prompts in Turkish.¹

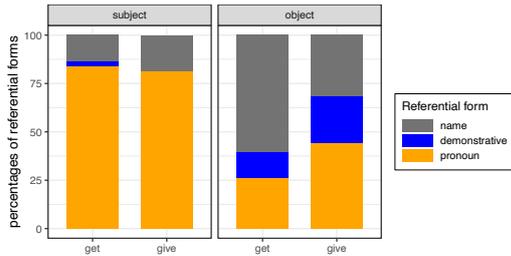


Figure 3: Referential forms in German.

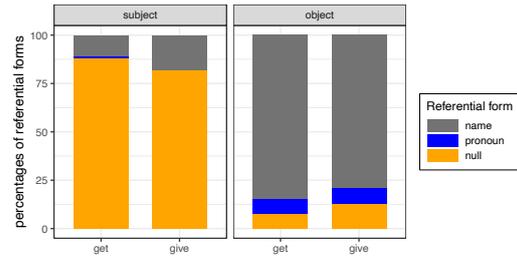


Figure 4: Referential forms in Turkish.

We investigated reference selection as well as reference form selection using three different continuation prompts in German and Turkish, manipulating verb type (see Table 1 for a summary of the experimental method). Experiments were presented on Ibex Farm.

For reference selection (Fig. 1 and 2),¹ both languages showed an effect of thematic roles with a bias for recipients over agents, as visible by more references to the subject for *get*-type than for *give*-type verbs with all three prompts. This runs counter to a prominence-based influence of thematic roles because agents are more prominent than recipients (see Patterson & Schumacher, 2021), but is in line with event-based thematic influences (e.g., Stevenson et al., 1994). We will corroborate this finding with an analysis of the produced coherence relations. With regard to structural factors, Turkish null and p-pronouns and German p-pronouns show a strong subject bias modulated by verb bias whereas German demonstratives show a strong object bias, also modulated by verb bias.

As for reference form selection (Figures 3 and 4), references to the subject showed the same pattern for Turkish null pronouns and German p-pronouns. For reference to objects, in contrast, we found a strong name preference in Turkish and a more distributed pattern in German.

In sum, Turkish null and German p-pronouns are in correspondence both for interpretive preference and choice of referential form. Turkish p- and German d-pronouns converge for choice of referential form – when they are used at all, they are used for referring back to the object – but diverge for interpretive preferences – Turkish p-pronouns prefer subject antecedents whereas German d-pronouns prefer object antecedents. We will compare our findings with results for psych verbs in German (Bader et al., to appear) and Turkish (Konuk & von Heusinger, 2021). We will argue for a separation of thematic role effects from structure-based prominence effects along the lines of Stevenson et al. (1994).

¹Note that percentages do not sum to a 100% in the no-pronoun prompt condition (German and Turkish) and in the null-pronoun condition (Turkish), mainly because of references to the inanimate theme object.

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An experimental investigation of the interaction of narrators' and protagonists' perspectival prominence in narrative texts

Anna Pia Jordan-Bertinelli, Christopher Saure and Stefan Hinterwimmer
University of Witwatersrand (Johannesburg) and University of Wuppertal

In this paper, we present the results of an experiment investigating the effect of different narrative situations on the availability of locally prominent protagonists as anchor for Free Indirect Discourse (FID). FID is often used in narrative texts to express thoughts or opinions belonging to a protagonist mentioned in the preceding text. It differs from Direct Discourse (DD) and Indirect Discourse (ID) in that instead of explicitly marking its content as representing a thought or utterance via quotation marks or embedding it under a propositional attitude verb, FID instead relies on its content, context and certain linguistic cues for its interpretation and is dependent on having a suitable, prominent anchor to function as its perspectival center. While normally the speaker of an utterance will serve as the assumed perspectival center of the expressed thoughts, things differ in narrative texts due to the necessary distinction between the narrator telling the story and prominent protagonists appearing in it who often function as the anchor for FID instead. While the narrator may be prominent on a global level, a protagonist can become prominent locally, with respect to a single sentence or text segment. According to Zeman (2020), this feature of narrative texts installs them with a potential for multiperspectivity absent from everyday conversation.

The most popular line of analysis proposed for FID (see Schlenker 2004 or Eckardt 2014, for example), is that sentences can not only be interpreted with respect to a single context *C*, which is the context of the speaker (in oral conversation) or the narrator (in fictional texts), but also with respect to an additional context *c*. *c* is the context of some protagonist that has been made prominent by the preceding linguistic context. In contrast to DD and ID, which are fully interpreted either with regard to *c* or with regard to *C*, respectively, FID is partially interpreted with regard to both contexts; pronouns and verbal tense markings are interpreted with regard to *C*, while all other context-sensitive expressions are interpreted with respect to *c* whenever *c* has been introduced.

While there have been experimental investigations on the availability of locally prominent protagonists in narrated texts featuring a third-person narrator (Hinterwimmer & Meuser 2019) or a homodiegetic first-person narrator (Bimpikou 2020), a protagonist's availability as anchor in the presence of a prominent heterodiegetic third-person narrator has not been investigated experimentally. A deeper understanding of the influence the narrator's perspectival prominence has on the availability of protagonists as perspective takers is crucial for our understanding of how perspective taking in narrative texts works, however.

Therefore, we conducted an acceptability rating study and created items in three conditions: condition A featured a neutral third-person narrator, condition B a homodiegetic first-person narrator and condition C a prominent, evaluative third-person narrator. All items consisted of four sentences and ended with FID from a locally prominent protagonist's point of view. Participants had to rate the acceptability of the FID sentence on a scale from 1-7. Condition B received significantly lower ratings than the other two conditions, whereas there was no significant difference between conditions A and C. This indicates that a prominent third-person narrator does in fact not have a strong effect on the protagonists' availability as anchor for FID, while a homodiegetic first-person narrator does.

A forced-choice study using the same setup, in which participants had to choose if the thought expressed by FID belonged to the narrator or the protagonist, was meant to ensure that participants were actually interpreting the final sentence as FID and not as a comment by the

narrator in condition C. Its results proved that there was a strong tendency to choose the protagonist as perspectival center in all conditions.

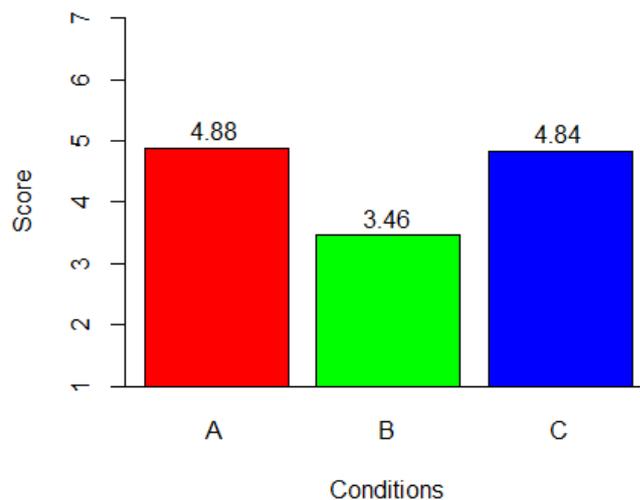
Our experiments thus managed to confirm that locally prominent protagonists can function as potent perspectival anchors for FID even in the context of a globally prominent narrator and prove that narrative texts indeed possess an inherent potential for multiperspectivity.

(1) Exemplary test item in conditions a), b) and c):

a)/b) Als Julia, komplett mit Reithelm und Gerte ausgerüstet, in den Stall kam, war Tarek/ich dabei, ein Pferd zu satteln. Er/Ich legte dem sonst so nervösen Hengst in kürzester Zeit den Sattel an und das Tier beruhigte sich sofort und ließ sich von ihm/mir streicheln. Sie sah ihm/mir erstaunt vom Rand der Box dabei zu. Wow, dieser Schönling kannte sich ja echt gut aus mit Pferden!
When Julia arrived at the stable, fully equipped with riding helmet and riding crop, Tarek/I was busy saddling a horse. He/I put the saddle on the usually very nervous stallion in no time at all, and the animal immediately calmed down and let itself be petted by him/me. She watched him/me in amazement from the edge of the stall. Wow, this pretty boy really knew his way around horses!

c) Als Julia - ein etwas schüchternes Mädchen leider - in den Stall kam, war Tarek dabei ein Pferd zu satteln, der blöde Wichtigtuer. Er legte dem sonst so nervösen Hengst in kürzester Zeit den Sattel an, und das war echt ein wildes Vieh, da kann man nichts sagen. Sie sah ihm erstaunt vom Rand der Box dabei zu. Wow, dieser Schönling kannte sich ja echt gut aus mit Pferden!
When Julia - a somewhat shy girl, unfortunately - came to the stable, Tarek was saddling a horse, the stupid blowhard. He put the saddle on the usually nervous stallion in no time at all, and it really was a wild beast, there is no question about it. She watched him in amazement from the edge of the stall. Wow, this pretty boy really knew his way around horses!

(2) Results of acceptability rating study: Mean ratings of all three conditions (ratings stem from a scale of 1 to 7)



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Preverbal foci are syntactically disparate but prosodically uniform

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In many V-final languages, narrow foci appear immediately preverbally, preferentially or obligatorily (Kim 1988; Kidwai 1999, a.o.). Syntactically, focus-verb adjacency has been derived (i) either via a functional Spec-Head configuration (= raised), or (ii) via displacement of intervening material (= in-situ). In (i), the focused constituent moves to a dedicated Spec, FP, and the verb raises to F⁰, thereby creating adjacency (Hungarian: Bródy 1990; Malayalam: Jayaseelan 1996; Persian: Karimi 2008). Alignment of focus with nuclear stress, which targets Spec, FP, has been hypothesized to trigger movement (Hungarian: Szendrői 2003). In (ii), focus-verb adjacency results from the displacement of intervening material to the left or right periphery (Hindi: Mahajan 1990; Turkish: Şener 2010; Basque: Arregi 2002), motivated either by the information-structural properties of the displaced material (Şener 2010) or by the need for the focused constituent to carry nuclear stress (Arregi 2002). Whether (i) or (ii) is used in a given language can be determined based on e.g., scope facts, the position of the *focus+verb* string within the clause, and verb-inversion phenomena. The availability of two disparate derivations suggests that preverbal focus placement is not a grammatical primitive, but instead represents coincidentally identical outcomes of two different syntactic processes.

In this paper, we offer a unified account of preverbal focus placement of (i) and (ii) types, rooted in the requirements of prosodic structure. Following Hamlaoui & Szendrői (2015), we take an Intonational Phrase (*ι*) to correspond to the highest syntactic projection that hosts verbal material (HVP), including its specifier, which is enforced by ALIGNHVP-L and ALIGNHVP-R constraints, Optimality Theory-style. Following Féry (2013), we assume that focused constituents align with *ι*-edges (Focus-as-Alignment=FA), via ALIGN-FOC-*ι*-R or ALIGN-FOC-*ι*-L constraints. Nuclear stress, in languages that have it, in the FA approach is also aligned with an *ι*-edge, enforced by H-*ι*-R or H-*ι*-L.

Bringing these analytical components together, we propose that preverbal foci in OV languages are aligned with edges of *ι*. Raised foci, (i), align with the left edge of *ι*, being housed in the specifier of XP that also attracts the raised verb (ALIGN-FOC-*ι*-L; Féry 2013). There, in languages that have nuclear stress, they receive prosodic prominence associated with the left edge of *ι* (H-*ι*-L). We illustrate this language type with Hungarian and extend the analysis to Iron Ossetic (Iranian) and Eastern Armenian. In-situ foci, (ii), align with the right edge of *ι* and receive prosodic prominence there (ALIGN-FOC-*ι*-R and H-*ι*-R, if applicable). The material intervening between the focus and the verb is displaced, allowing for the focused constituent to satisfy ALIGN-FOC-*ι*-R. The verb to the right of the focused constituent routinely undergoes prosodic integration, and does not interfere with right-alignment of focus (Truckenbrodt 2006, Buring 2012). We use Turkish as the illustration and extend the analysis to other Turkic languages (Uyghur, Kazakh) and Georgian (Kartvelian). Overall, bringing together the FA and HVP approaches allows for a unified account of syntactically disparate preverbal foci – a theoretical contribution that, to the best of our knowledge, has not been made before.

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Syntactic and prosodic cues for prominent clauses

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Syntactic subordination appears to influence the prominence status of subjects: in configurations with a main clause and a subordinate clause, cf. (1), the subject of the second clause is less frequently pronominalized than when the second clause is also a main clause, cf. (2) (e.g. Miltsataki 2011). However, this effect may not be due to syntactic subordination per se, but rather be the result of the relative prominence of the propositions, for which syntactic subordination is but one cue. We present original data showing that both syntactic and prosodic cues indicate the level of integration or subordination of the second clause and thus affect the accessibility of its subject.

Our experiment explores the interaction of syntactic and prosodic cues in a 2x3 design. Participants interpreted an ambiguous pronoun after hearing an audio recording of a German mini-discourse containing the proper names of two subject referents of the same gender. The discourse always consisted of a main clause followed either by a subordinate clause introduced by the causal connective *weil* and with verb-final word order (1), or by a main clause introduced with the causal connective *denn* and with main-clause (V2) word order (2). In addition, the strength of the prosodic boundary between the two clauses was manipulated in three conditions: (i): without a clear boundary pitch movement and a pause of only 30 ms (no/weak boundary: \emptyset); or with a pause of 250 ms and (ii) a boundary rise or (iii) a boundary fall (strong high/low boundary: H%/L%). The complex sentence was followed by a third clause with an ambiguous pronoun as the subject of a nonce verb. Participants were then asked which of the two subject referents the pronoun referred to (forced-choice: e.g., *Wer daupte?* [*Who dauped?*]).

- (1) [main-sub] Nadja hat vegane Burger gekauft $\begin{cases} \emptyset \\ H\% \\ L\% \end{cases}$ weil Sabine kein Fleisch isst. Sie daupte.
Nadja has vegan burgers bought because Sabine no meat eats. She *dauped*.
- (2) [2-main] Nadja hat vegane Burger gekauft $\begin{cases} \emptyset \\ H\% \\ L\% \end{cases}$ denn Sabine isst kein Fleisch. Sie daupte.
because Sabine eats no meat. She *dauped*.

We analyze the proportion of pronouns resolved to the subject of the first clause (e.g., “Nadja” in (1)-(2)). We expect to find two main effects. First, we predict a main effect of the syntactic manipulation: more pronouns resolved to the the first referent in the *weil*-condition than in the *denn*-condition. Second, we expect a main effect of the prosodic manipulation, with contrasts between all three conditions. We predict that with no or only a very weak boundary (1- \emptyset , 2- \emptyset), reference of the ambiguous pronoun to the first subject is higher than with a strong boundary (1-H%/L%, 2-H%/L%), because a strong boundary should increase the likelihood of an interpretation of the second clause not as integrated, but as independent and thus more prominent. In addition, we predict that resolution to the first referent is higher with a high (1-H%, 2-H%) than with a low boundary (1-L%, 2-L%), because in German high boundaries signal non-finality, while low boundaries signal finality (e.g. Grice & Baumann 2007). Preliminary results based on 111 participants show a clear effect of the syntactic cues, and a somewhat unexpected interaction between syntax and the high boundary condition in terms of resolution to the first referent (Figure 1).

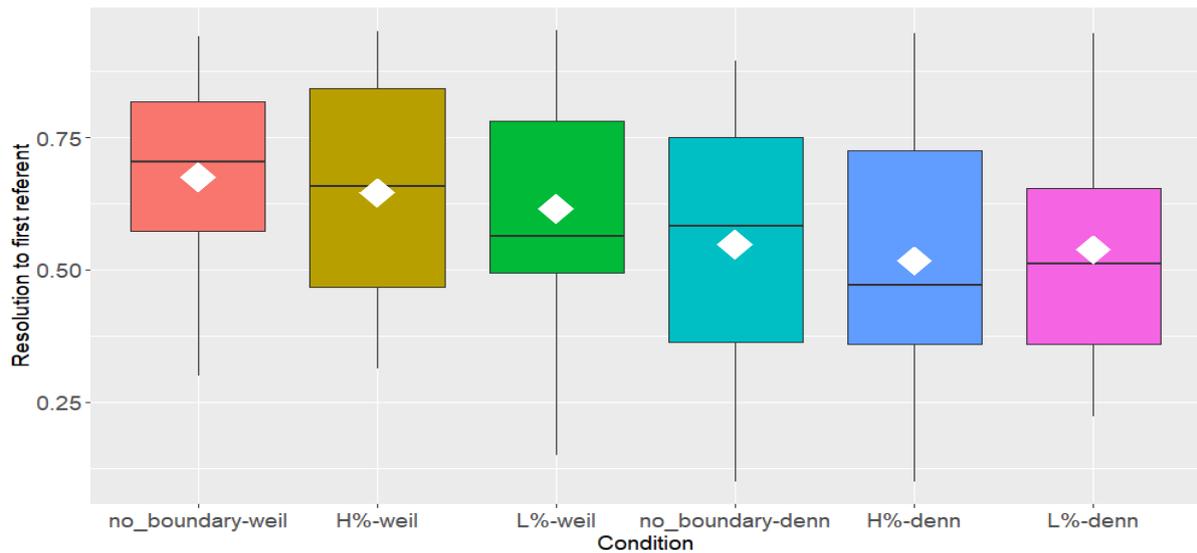


Figure 1. Boxplot showing resolution of the ambiguous pronoun to the first referent per condition, across 24 items. Based on data from 111 participants. Bars indicate medians, diamonds indicate means.

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Marking discourse prominence or marking a shift in attention? The case of Bulgarian differential object indexing

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Recent accounts on differential object marking (DOM) relate the special marking of a particular argument or referent to “the speaker’s assessment of its saliency” [1] and attribute it to deviances with respect to its discourse status [2]. This perspective can be systematized by the application of the notion of *discourse prominence* [3] that captures the tracking and (dynamic) ranking of several referents in discourse in a non-categorical way.

We show that this perspective is particularly suited for the description and explanation of differential object indexing (DOI; traditionally known as object reduplication or clitic doubling) in Bulgarian. DOI is a subtype of DOM and consists of a bound element on the verb cross-indexing a co-nominal element (e.g. NP) in the sentence. We challenge previous accounts assigning a pure topic-marking function to DOI in Bulgarian by presenting natural examples and experimental evidence. For example, DOI sometimes co-occurs with focal elements or is used to (re-)active a previously prominent element whose status became obscure [4]. These examples suggest that DOI is not marking the topicality of the referent but rather related to a particular (medium-level) activation of a referent.

To investigate this further, we conducted a web-based experiment combining comprehension questions, acceptability judgment and reaction time measurement. In each trial, a discourse topic was established by repeated mention in the discourse (e.g. *Peter* in the example stimuli below) and a second referent (*the woman*) introduced right before the critical sentence. In the target sentence, the most prominent element was referred to as object with or without DOI. This was contrasted with target sentences either presenting the second (less prominent) referent as object or a discourse-new (not prominent but inferable) referent, both with DOI. Among the DOI conditions, cross-indexing less prominent referents yielded the strongest behavioural response in comparison to indexing the most prominent or the non-prominent referent (see figures below). Responses to the comprehension question were more accurate, the reaction times quicker and the acceptability judgment higher for the referent with a medium prominence level (except for reaction time, all these effects were significant – both in an interaction as well as a group-level analysis). These results support the idea that DOI is sensitive to fine-grained prominence differences and serves as a prominence-lending cue for referents that initially have a medium-level discourse prominence rank based on the previous context.

It is less clear however if DOI serves as a marker of a particular prominence level or rather as an attentional cue indicating to the listener that there is a substantial (less predictable) shift in the prominence ranking of the referents that are currently accessible in the common ground. To some extent, this resembles the recent discussion of (unbound) demonstrative pronouns in German that are associated with re-orientation towards less prominent referents – thereby expressing a certain aspect of contrast or shift in attention [5]. We elaborate on the validity of postulating a prominence-related attention marking function with respect to the findings presented above and discuss potential targets for future research on this issue.

Examining acoustic evidence for word-level prosodic prominence in Waima'a

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This paper examines acoustic evidence for stress at the word level in Waima'a, an Austronesian language spoken in Timor-Leste, located in the south east of the Indonesian archipelago. Waima'a has been described as having no word-level stress, but only phrase-level prosody, characterised by pitch movements at the right edge of the intonation unit (Himmelman 2010). The location of Waima'a can be seen in Figure 1.

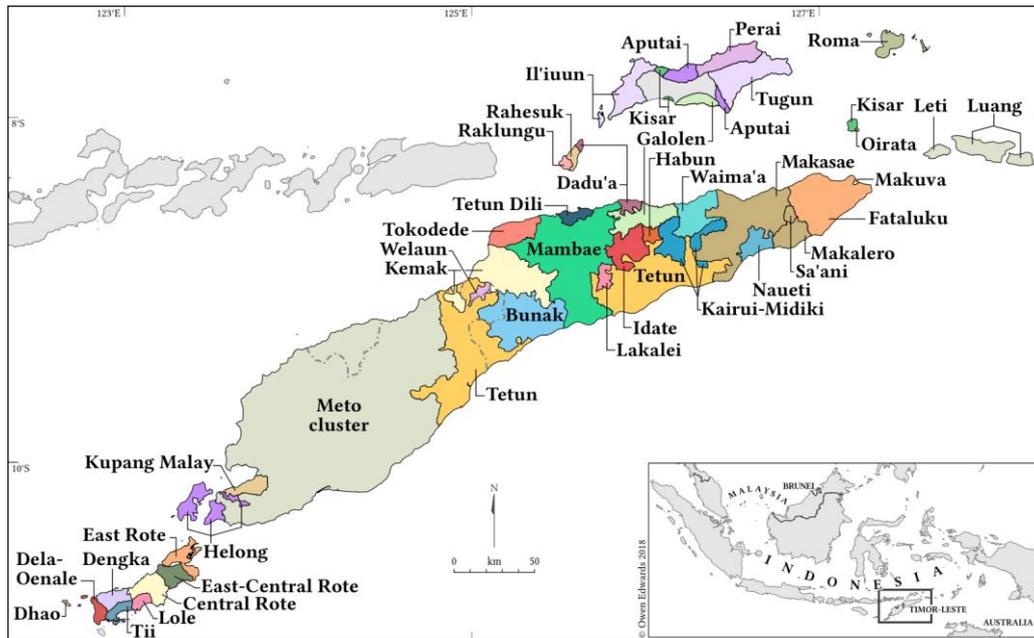


Figure 1: Languages of Greater Timor

Following the methodology of Kaland (2019), this study considers six potential acoustic correlates of word stress, namely F0 movement, rise/fall ratios, duration per segment, duration deviation¹, two measures of spectral tilt (H1-A2 and H1-A3) and vowel displacement from the centre of the vowel space (i.e. vowel reduction). These measurements are mostly derived from raw measures such as raw F0 and raw duration, and are intended to reduce the possible interference of phrase-level prosodic phenomena (Kaland 2019: 59). More broadly, derived measures have been found to be more reliable correlates of stress than raw measures (Gordon and Roettger 2017).

The data used in this study was taken from spontaneous narratives collected by the author during a field trip in 2019. Penultimate and ultimate syllables of disyllabic words were compared. This is because word stress — if there is evidence for it — tends to fall on the penultimate syllable in languages of Eastern Indonesia (Kaufman and Himmelman 2021).

A statistical analysis was carried out using Linear mixed models fit by maximum likelihood. A given measure was the response and syllable (penultimate and ultimate) was the predictor. Speakers and items (words) were included as random intercepts. For each measure, likelihood

¹ Duration deviation refers to duration of a given syllable minus the mean duration of all syllables with the same structure (e.g. CV, CVC). Positive duration deviation is indicative of longer syllables, while negative indicates shorter syllables.

ratio tests (χ^2) were carried out, comparing the model to an intercept-only model (i.e. without the effect of syllable) in order to determine the significance of syllable (penultimate vs ultimate). Table 1 reports the results of the statistical analysis for all measures, except for vowel displacement which is reported in Table 2.

Table 1

	Penultimate syllable		Ultimate syllable		χ^2	p
	mean	SD	mean	SD		
F0 movement (ST)	3.04	3.38	2.87	3.22	0.45	=0.503
Rise/fall ratio	0.77		0.62		0.82	=0.366
Duration per segment (ms)	82.8	35.39	68.14	22.88	1.34	=0.247
Duration deviation (ms)	2.28	42.19	-2.28	46.08	1.48	=0.224
H1-A2 (dB)	14.46	11.54	13.45	12.22	0.61	=0.433
H1-A3 (dB)	24.09	10.98	21.73	14.05	5.20	=0.23

Although differences can be observed between penultimate and ultimate syllables for several measures, no significant effects of syllable were found for any of the acoustic measures listed in Table 1.

Table 2 reports mean F1 and F2 (Bark) per vowel for penultimate and ultimate syllables. It also reports on the affect of syllable on formant displacement relative to centre of the vowel space. This was calculated by performing post-hoc pairwise comparisons using Tukey HSD test (Bonferroni corrected) on the interactions between the fixed factors syllable (two levels: penultimate, ultimate) and vowel (five levels: /i/, /e/, /a/, /o/ and /u/) with speakers and items (words) as random factors. This was to test the possible effects of syllable on formant displacement for each vowel separately.

Table 2

	F1		F2		p
	Penult. syllable	Ult. syllable	Penult. syllable	Ult. syllable	
/i/	3.95	3.85	13.25	12.75	=0.99458
/e/	5.04	4.81	12.21	12.4	=1
/a/	6.64	6.33	11.1	10.9	=0.9539
/o/	5.45	5.24	9.98	10.26	=0.99997
/u/	4.04	4.45	10.25	9.91	=0.59567
centre	5.35		11.21		

The approximate vowel space of Waima'a can be seen in Figure 2.

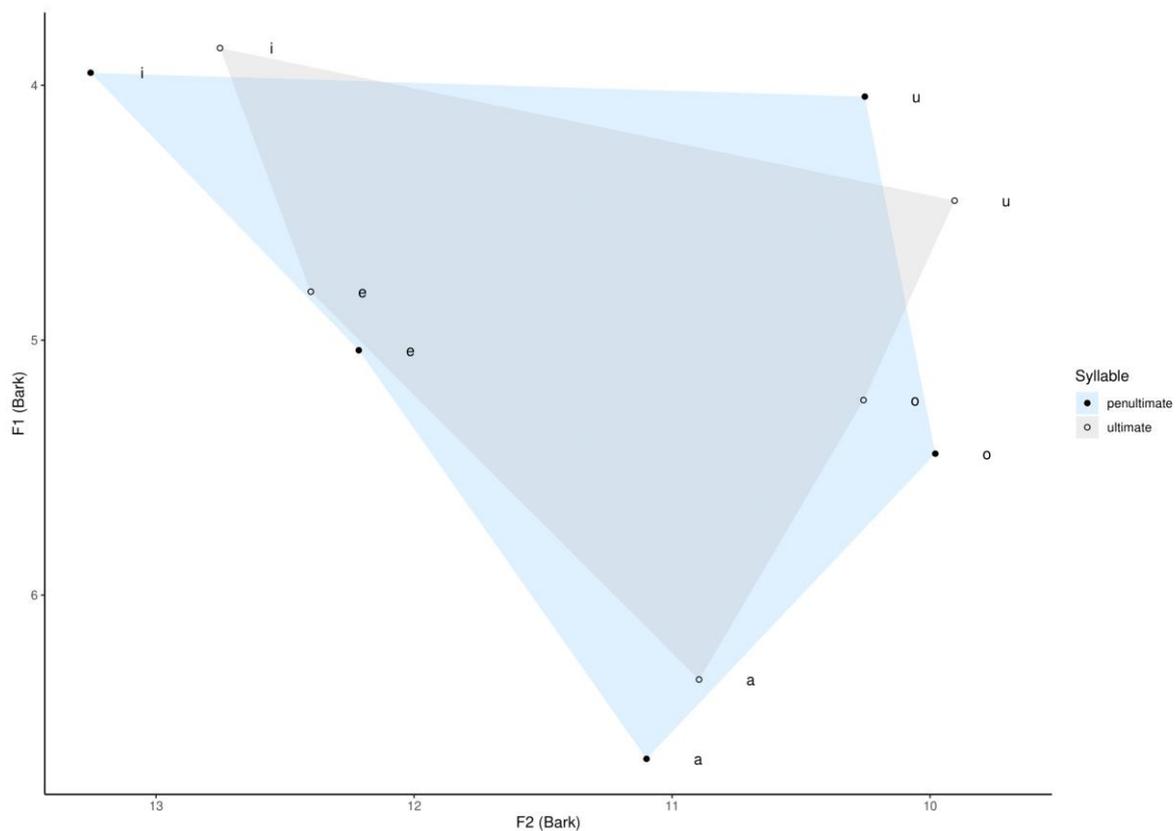


Figure 2: Waima'a vowel space

Some differences can be observed in the between the position of penultimate and ultimate syllables in the vowel space in Figure 2. However, the syllable was not found to have any significant affect on formant displacement for any of the vowels, as can be seen in Table 3.

This paper finds no evidence for acoustic marking of word stress in Waima'a, supporting an analysis of Waima'a as a language without word stress as described by Himmelmann (2010). This study also contributes to our understanding of word prosodic systems in languages of Eastern Indonesia more broadly, which have generally not been well-studied quantitatively.

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Example stimuli for the four conditions (object index and co-nominal in bold):

Context (translated): The next story is about **Peter**. Yesterday, **Peter** was at a party and Ø talked to a beautiful woman for a long time. Suddenly, ...

a. Most prominent referent (and discourse topic) without DOI

ženata go celunala
 woman-ART.SG.F 3.SG.M.ACC kiss-PTCP.SG.F
 ‘the woman kissed him.’

b. Most prominent referent (and discourse topic) with DOI

ženata go celunala **Petār.**
 woman-ART.SG.F 3.SG.M.ACC kiss-PTCP.SG.F Peter
 ‘the women kissed Peter.’

c. Less prominent referent with DOI

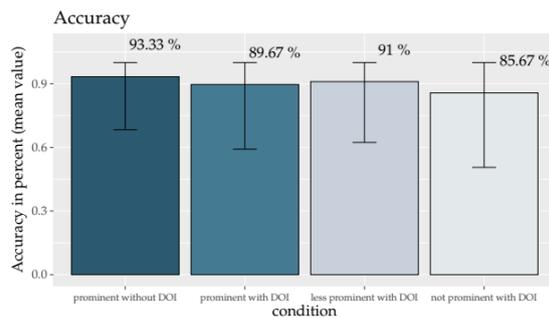
Petār ja celunal **ženata.**
 Peter 3.SG.F.ACC kiss-PTCP.SG.M woman-ART.SG.F
 ‘Peter kissed the woman.’

d. Not prominent (but inferable) referent with DOI

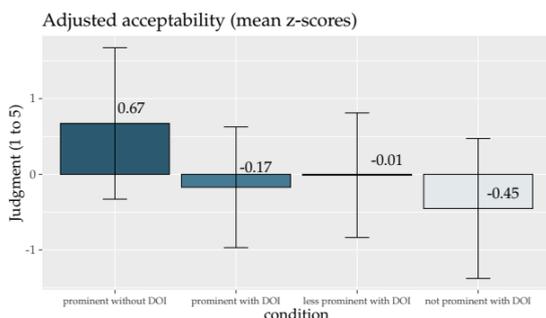
Petār ja celunal **domakinjata.**
 Peter 3.SG.F.ACC kiss-PTCP.SG.M host-ART.SG.F
 ‘Peter kissed the (female) host.’

Plots for the relevant domains measured in the experiment

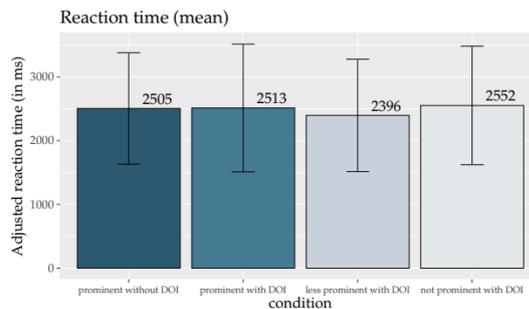
Boxplot of mean accuracy



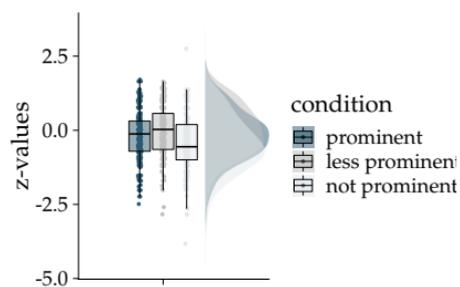
Boxplot of (adjusted) acceptability z-scores



Boxplot of (adjusted) mean reaction time



Raincloudplot of z-values



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Gestures accompany new and focused referents in discourse

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How speakers linguistically distinguish between new/given or topical/focused information in discourse is a well-established field of research. What role the visual/gestural parts of language play, however, is less well understood. This study examines *when* speakers use speech-accompanying gestures in the flow of discourse, and if so, *how they use them*. It has previously been suggested that information structure plays a key role (McNeill, 1992). For instance, there is evidence that gesture presence and mode of representation depend on a referent's accessibility (more/less accessible) and/or on how a referent is expressed (lexical noun phrase (NP) vs. pronoun) (Debreslioska, Özyürek, Gullberg & Perniss, 2013; Perniss & Özyürek, 2015; Debreslioska & Gullberg, 2019). As such, speech-accompanying gestures have been considered prominence lending cues which parallel or complement speech (Debreslioska, 2019; Debreslioska & Gullberg, 2020). However, some important information structural dimensions such as 'aboutness' (topic vs. focus elements of the clause) and how they influence gesture use remain largely unexplored. This study therefore examines gestures' sensitivity to 'aboutness', in addition to referent accessibility and referential form, and tests the potential interaction between these variables, in the production of connected discourse.

The data set consisted of 30 videotaped narrative retellings by 10 native speakers of German. We used three short Charlie Chaplin movie clips as stimulus material ('The Lunch Break' extracted from *Modern Times*, 1936; 'The Date' and 'The Good Deed' extracted from *City Lights*, 1931). Participants produced their narrative retellings in a dialogical situation, in which a confederate acted as listener.

For the speech coding, we first divided the narratives into clauses (unified predicates expressing a single situation; Berman & Slobin, 1994). Then we identified all referential expressions, and coded them for form (lexical NP vs. pronoun), referent accessibility (more vs. less accessible), and 'aboutness' (i.e., part of the topic or focus element of the clause). The identification of gestures was carried out in ELAN, a software developed for the frame-to-frame analysis of digital video (Sloetjes & Wittenburg, 2008). We annotated all gesture strokes (i.e., the most meaningful parts of the gestural movements) without the availability of speech in order to guarantee an objective procedure based on the physical features of hand and arm movements. In a second step, the sound was turned back on and we selected those gestures that temporally co-occurred with referential expressions. A gesture counted as co-occurring with a referential expression if the gesture stroke temporally aligned with at least one syllable of the referential expression and did not also co-occur with an additional content word. The selected gestures were categorized as *referential* or *non-referential* (i.e., as representing some property of the referent and/or its actions/movements by way of iconicity/deixis or not).

The data were analyzed from three perspectives. Analysis 1 examined how likely different types of referential expressions are accompanied by gestures (IV: referential form, referent accessibility and aboutness; DV: presence/absence of gesture). Analysis 2 took the gestures as starting point and examined how they pattern with the different properties of the referential expressions (IV: referential form, referent accessibility and aboutness; DV: number of gestures). Analysis 3 also took the gestures as starting point and examined gesture referentiality in relation to 'aboutness' (IV: aboutness; DV: gesture referentiality).

Preliminary results for analysis 1 showed that gestures are more likely to occur with lexical NPs and less accessible referents. However, there was no relationship between ‘aboutness’ and the presence/absence of gestures (i.e., speakers are similarly likely to use gestures with topical and focused referents). Analysis 2 showed that more gestures are produced with lexical NPs, less accessible referents, as well as with referents that are part of the focus element of a clause. Analysis 3 showed that *non-referential* gestures associate with topical referents whereas *referential* gestures associate with focused referents. The findings suggest that speech-associated gestures play an important role in the expression of information structure. That is, if we take speech as a starting point, referential form and referent accessibility predict the incidence of gestures. Furthermore, if we start with gestures, that is, if we come across a gesture in discourse, it is highly likely that the co-occurring speech will be part of the focus element of a clause. The findings further highlight the role of information structure for our understanding of gesture functions, namely by showing that ‘aboutness’ can predict *how* gestures will be produced (i.e., whether they are *referential* or *non-referential*).

The study reveals important relationships between speech-accompanying gestures (in terms of their presence and referentiality) and (the expression of) newness and aboutness. Newness and aboutness belong to the set of prominence-related functions (Himmelmann & Primus, 2015), which therefore strengthens the view that gestures might be used as visual prominence lending cues in addition to prominence markers in speech. Further research is needed to clarify in which situations gestures are more likely to be recruited to highlight prominent information and in which situations they tend not to be, perhaps as a function of how many other cues are used in speech. To conclude, the study provides new insights into the integrated nature of speech and gestures and emphasizes the importance of considering gestures in studies of language and discourse.

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An Evaluation of Secondary Prominence in Spontaneous Brazilian Portuguese

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Secondary stress refers to prominences that occur in a word in addition to the main prominence (primary stress). However, not only are solid phonetic parameters to detect secondarily stressed syllables lacking, but there is also disagreement about its role in language-specific phonology (cf. Cutler 2010, Tabain et al. 2003). Whatsmore, methodological and theoretical differences in investigations of secondary stress make it difficult to extract meaningful generalizations. Major unresolved issues include: the role of phrasal prominence, differences between spontaneous and prepared speech, and the role of morphosyntactic processes such as derivation in the phonetic expression of secondarily stressed syllables.

This paper tackles those issues by examining the acoustic properties of unstressed syllables in spontaneously produced Brazilian Portuguese. Four main traits make Portuguese ideal for the investigation secondary prominence: i) the frequency of long uncompound words in the core vocabulary (e.g. *borboleta* /boɦ.bo'le.tɛ/ for ‘butterfly’); ii) common derivation processes through affixation (*borboletinha* /boɦ.bo.le'tʃi.nɐ/ ‘small butterfly’); iii) variable stress location; and iv) widespread unstressed vowel reductions (see Cristófaros-Silva et al. 2019). There is also wide disagreement regarding secondary stress in Portuguese, which may partly derive from methodological issues and different data sources (cf. Abaurre & Galves 1998, Arantes & Barbosa 2006, 2008, Fernandes-Svartman et al. 2019, Magalhães 2019, Moraes 2003). To the best of our knowledge, this is the first study of secondary prominence that examines spontaneous speech.

Method. The data analyzed here comes from recordings of 40 Brazilian Portuguese speakers (20 female, mostly from Minas Gerais state), from a preexisting database (Follador Neto et al. 2019). We extracted all polysyllabic words of four or more canonical syllables from the corpus. Main dependent variables were *duration*, intensity, spectral emphasis, F1, F2 and f0. Independent variables included: word size (no. of syllables), location relative to the primarily stressed syllable (pre- or post-stressed), distance to the stressed syllable (in no. of syllables), derivation status (simple or derived). Additionally, for derived words we coded whether the syllable carried main stress in the underived form. Independent control variables included: vowel height (high, mid, or low), nasality (oral or nasal), and position within the Intonational Phrase (pre-boundary, post-boundary, or mid-phrase).

The data were manually segmented and annotated. Praat scripts extracted all the acoustic measurements. A statistical classifier was used to identify patterns based on the most relevant acoustic cues. The results were compared with a classification based on the locations of secondary stress predicted by phonological studies and the comparison was tested for statistical significance in R.

Results & Discussion. A preliminary assessment of the data suggests that secondary stress placement is more variable than predicted by phonological studies. It appears to interact with both morphological factors, and with vowel reduction phenomena. While postulated by phonologists, phonetic studies have found little support for the existence of systematic secondary prominence in Portuguese, few of which have examined spontaneous speech. The full analysis of the present data will help resolve some of those issues.

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Differential Object Marking and discourse prominence in Spanish

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In Spanish, human, indefinite direct objects optionally receive Differential Object Marking (DOM), realized by *a*, which is derived from the homophone preposition *a* ‘to’. The parameters that determine DOM are animacy, referentiality and information structure (inter alia Fábregas 2013). Leonetti (2004) and Iemmolo (2010) assume that the crucial parameter for DOM is topicality, which they define in terms of aboutness topic. In this presentation, we take a more general discourse perspective and assume with Chiriacescu & von Heusinger (2010) that DOM marking signals the prominence of the direct object. We measure the discourse prominence of arguments by their topic continuity (Givón 1983), i.e., by their frequency to be anaphorically taken up in the subsequent discourse. Thus, we predict for Spanish that DOM marked human indefinite direct objects are more often rementioned in the following discourse than unmarked human direct objects.

We tested this hypothesis with a corpus study and a paragraph continuation task. The corpus study is based on the *Corpus del Español del Siglo XXI*. The study focuses on written European Spanish and analyzes sentences containing both a human subject (Ref1) and an indefinite human direct object (Ref2), such as in (1). Two searches were employed, one with DOM and the other without DOM. In total, 3942 sentences were analyzed, of which we could only use 112 sentences with human arguments in subject and object position. We annotated the first following clause for anaphoric uptake of Ref1 and Ref2. Because of this scarce data, we conducted an online paragraph continuation experiment with 24 test items consisting of a small paragraph with three sentences and two or three human referents, of which the last one was introduced by an indefinite direct object with or without DOM (see ex. (2)). We asked participants to add one continuation sentence to each test item. The experiment was distributed via Prolific and we annotated 1848 test sentences produced by 77 participants, who were all native European Spanish speakers.

The results are summarized in Table 1. As for the corpus search, the numbers reveal that there are more referential uptakes of direct objects (Ref2) with DOM than without DOM. Moreover, we observe the mirror images for uptakes of the subject (Ref1). With regard to the paragraph continuation task, the results show first of all that there is a much higher frequency of uptake for direct objects (Ref2) than for subjects (Ref1). The results from the paragraph continuation task indicate a slight preference of uptake for the direct objects with DOM. Interestingly, this effect is most pronounced for contexts with three human referents, while it is not visible in contexts with two referents (see Table 2). We think that contexts with more than two referents allow to better model the subtle effects of DOM on referent management in discourse.

We conclude that our corpus search as well as our paragraph continuation task supports the hypothesis that DOM signals discourse prominence of human indefinite direct objects in Spanish.

(1) **Context:**

Mi padre₁ envió a un hombre₂ a buscarme
'My father₁ sent DOM a man₂ to look for me'

Continuation:

y desde luego que ese batidor₂ era bueno, porque me encontró.
'and of course this scout₂ was good, because he found me.'

(CORPES XXI, 2011. Martínez, Gabi, *Sólo para gigantes*)

(2) **Context:**

El productor₁ veía que no quedaba demasiado tiempo de rodaje. Se dio cuenta de que el director₃ estaba totalmente desbordado y para que el proyecto no sufriese ningún retraso, envió un a ayudante₂.

'The producer₁ noticed that there was not much time left for shooting. He₁ realised that the director₃ was totally overwhelmed and to ensure that the project was not delayed, he₁ sent DOM an assistant₂.'

Continuation:

El ayudante₂ consiguió cumplir con las expectativas | y el proyecto se logró hacer en el tiempo esperado.

'The assistant₂ was able to meet expectations and the project was completed on time.'

	Corpus		Experiment	
	Ref1	Ref2	Ref1	Ref2
DOM	42,2% (35/83)	48,2% (40/83)	35,0% (297/848)	74,4% (631/848)
No DOM	55,2% (16/29)	37,9% (11/29)	37,2% (306/823)	71,3% (587/823)

Table 1: Next mention bias of Ref1 and Ref2 in the corpus study and the experiment

	Experiment	
	AddRef	NoAddRef
DOM	73,3% (313/427)	75,5% (318/421)
No DOM	67,0% (276/412)	75,7% (311/411)

Table 2: Next mention bias of Ref2 with [±Additional Referent]

Corpus

REAL ACADEMIA ESPAÑOLA: Banco de datos (CORPES XXI) [en línea]. *Corpus del Español del Siglo XXI (CORPES)*. <<http://www.rae.es>> [last access: 06.01.2022]

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The varying prominence status of indirect speech in adversative contexts

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In this paper, we explore the temporal and argumentative anchoring potential of indirect speech realized as part of an embedded clause following *pero* ('but') + speech verb (in past tense). Traditional accounts of temporal discourse structure tend to analyze only the relationship of indirect speech with the preceding context (Rohrer 1985). By focusing on the following context and temporal anchoring relationships, we are able to investigate the hierarchical structuring in which the indirect speech takes part (Himmelmann/Primus 2015; Becker/Egetenmeyer 2018). The co-occurring conjunction *pero* ('but') assigns an argumentative value to the clause which may boost its prominence status (Egetenmeyer talk).

In a basic conception in the lines of discourse representation theory (Kamp/Rohrer 1983; Kamp/Reyle 1993), textual development is brought about by perfective main verbs. Therefore, an embedded clause of indirect speech is not expected to contribute to temporal development (Forăscu et al. 2006: 67-68). This entails that a following reference time (Becker/Egetenmeyer 2018) is not anchored to a time corresponding to the embedded speech (see (1)).

- (1) [1] *María llegó_{perf} a la oficina.* [2] *Dijo_{perf} [3] que hacía_{imperf} mucho calor allí dentro.* [4] *Abrió_{perf} la ventana.*
'[1] Maria arrived at the office. [2] She said [3] that it was very warm in there. [4] She opened the window.'

The three (main) sentences in the example express a sequence of three events, [1] > [2] > [4]. Crucially, the time point introduced via the event in [4] (*abrió*, 'opened') is temporally anchored to the time introduced via the speech verb in [2] (*dijo*, 'said') (Becker/Egetenmeyer 2018). The main verbs ([1], [2], [4]) are marked for perfective aspect. A verb marked for imperfective aspect often pertains to the background (Weinrich 1982) and fails to advance narrative time (Kamp/Rohrer 1983). However, in a habitual context, the basic sequentiality in (1) may also be realized by verbs marked for imperfective aspect (*llegaba*, 'usually entered', *decía*, 'usually said', *abría*, 'usually opened'). In such a case, the embedded speech would also be expected to be of low prominence and not to play a role in the anchoring relationships.

Countering the described typical constellations, corpus data show that embedded indirect speech may display a varying degree of prominence if the speech verb follows an adversative connector. The connector attributes argumentative force to its argument (Anscombe/Ducrot 1977), which licenses the variability of the prominence value (Egetenmeyer talk). We focus on Spanish and analyze structures including *pero* ('but'). What we take as evidence for the prominence status is whether the proposition following the indirect speech is anchored to it or not. Example (2) presents the structure of interest. Again, the indirect speech ([3]) is not part of the anchoring relationship as [4] is temporally anchored to [2].

- (2) [1] *Finalmente, el cacique admitió_{perf} que Azzo estaba_{imperf} enterrado en el oasis,* [2] *pero dijo_{perf} [3] que sus huesos eran_{imperf} inviolables.* [4] *Nos dijo_{perf} que aquel hombre no era_{imperf} del todo normal [...].* (CREA: Cardeñosa, *El código secreto*, 2001: 336)
'[1] Finally, the chief admitted that Azzo was buried in the oasis, [2] but said [3] that his bones were inviolable. [4] He told us that the man was not quite normal.'

However, as (3) shows, the embedded clause may become part of the anchoring relationship. Then, the prominence value is boosted yielding equal prominence with respect to the surrounding propositions (see Becker/Egetenmeyer 2018 for a formalization). Then it becomes available as anchor for a following proposition. In (3), the anchoring of sentence [4] to [3] is made explicit by the recurring use of *vender* ('to sell').

- (3) [1] [D]e crío, sólo tenía_{imperf} dos [...] jaulas pequeñas [...], [2] **pero** mi madre me **decía**_{imperf} [3] **que** [...] los vendiera_{imperf.subj} en lugar de soltarlos. [4] Venderlos podría_{cond} haberlos vendido, porque algunos cantaban_{imperf} tan bien [...]. (CREA: Aguirre & Uña Zugasti, *Nuevas leyendas del Monasterio de Piedra*, 2000: 113-114)

‘[1] As a child, I only had two small cages, [2] but my mother told me [3] to sell them instead of letting them go. [4] I could have sold them, because some sang so well.’

While in example (2) the speech verb is marked for perfective aspect, it is marked for imperfective aspect in (3). However, the case of a prominence value which is elevated beyond equal prominence seems to be compatible only with speech verbs marked for perfective past. This elevated prominence can be shown when the indirect speech clause functions as anchor for a proposition realizing a subordinating rhetorical relation (Jasinskaja/Karagjosova 2020). In the corpus, we also find examples showing low prominence. Then, the indirect speech and the speech verb are both skipped in the anchoring relations (Egetenmeyer 2020). In the respective occurrences, the speech verbs are marked for imperfective past. We explain the variance on the grounds of a possible co-specification between the verb of speech or thought and the indirect discourse (Pustejovsky 1995). Co-specification paves the way for the influence of aspect.

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Prominence Facilitates Communication between Predictive Agents

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This presentation offers a formal model of prominence as an adaptive epiphenomenon in communication between predictive agents.

The model of communication is presented here in terms of *speakers* and *listeners*, although it applies equally to non-speech communication media. *Forms* are signals produced by a *speaker* and potentially interpretable by a *listener*, changing their *discourse state*. The goal of the speaker is to lead the listener from a default starting discourse state to a desired target discourse state, perhaps representing information new to the listener.

The model is based on 5 assumptions:

(A1) There is a joint distribution over discourse state transitions and forms. Agents use a single model of the relationship between a form f and transitions from one discourse state s_1 to another s_2 , namely a probability over triples $P(f, s_2, s_1)$. The activation of a form f in a given discourse state s_1 is the conditional margin probability $P(f | s_1) = \frac{\sum_{s_2} P(f, s_2, s_1)}{\sum_{f, s_2} P(f, s_2, s_1)}$.

(A2) Listeners adjust state distributions given received forms. Pickering & Garrod (2013, see also Pickering & Gambi 2018) describe a forward-modelling account of linguistic interaction in which the listener simulates the speaker's production and makes predictions about forthcoming productions. They correct their understanding of speaker intentions when heard forms do not match their predictions. The current model likewise assumes that listeners correct their predicted discourse state distribution given input forms using the conditional probability $P(f | s_2, s_1) = \frac{P(f, s_2, s_1)}{\sum_f P(f, s_2, s_1)}$, and Bayes' theorem (1) (see Rouder & Morey 2018).

$$(1) \quad P(s_2 | f, s_1) = \frac{P(f | s_2, s_1)}{P(f | s_1)} P(s_2 | s_1)$$

(A3) Speakers find state transition paths from common ground to informed states. Given a default shared discourse state s_0 , and a state s_n where the listener knows what the speaker wishes to convey, speakers construct a sequence of states $(s_0, s_1, s_2, \dots, s_n)$ and forms (f_1, \dots, f_n) such that the following hold:

(A4) Speakers seek consistent levels of interpretational confidence in the listener. Speakers maintain a certain level of confidence in the listener, so that the posterior probability of the discourse state never falls below a threshold θ , $P(s_2 | f, s_1) \geq \theta$. This assumption ensures that the forms produced by the speaker are effective in rendering the target discourse state probable to the listener.

(A5) Speaker minimises production effort. Finally, speakers attempt to achieve the desired threshold of listener confidence with a minimum of effort. Effort expended is approximated by a measure of how unlikely the form is to appear. It is expected that the less likely a form is, the more effort is required to express it. One measure fitting this requirement equates effort with the negative log likelihood $-\log_2 P(f | s_1)$ of producing form f after state s_1 .

The resulting model of communication represents both:

Discourse Prominence. Schumacher & van Heusinger (2019) identify discourse prominence with the likelihood with which a discourse referent will be picked out by a referring expression. This is represented by $P(s_2 | s_1)$ the likelihood of a particular new discourse state (e.g. after rementioning a referent) given the previous one.

Code Prominence: the ability of a form to steer the listener away from a predicted discourse state to another. The larger $\frac{P(f | s_2, s_1)}{P(f | s_1)}$, the more strongly state s_2 will be picked out.

The model will be illustrated with results from SFB1252 projects, including work by Savino et al. (2020).

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Some natural forces are animate agents

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Animate referents are inherently more prominent than inanimate ones when it comes to grammatical constructions. This prominence distinction is manifest in a broad range of grammatical phenomena where expressions referring to animate referents show a different, and usually a more finely nuanced, grammatical behavior than expressions referring to inanimate referents (e.g. split-ergative systems, plural formation, etc.). The well-known animacy hierarchy is one widely used construct to account for the manifold manifestation of this distinction (cp. Yamamoto 1999).

While the basic structure of this hierarchy is clear, with humans being more prominent than non-human animates, which in turn are more prominent than inanimates, there are many details that are still unresolved. One issue concerns the role of controlling or dynamic entities which are generally considered to be inanimate. With regard to such entities, it has been observed that expressions referring to intelligent machines and some kinds of natural forces are allowed to occur in argument functions otherwise mainly restricted to animates (Dixon 1972:306-311; Enghels 2007).

In this paper, we are concerned with natural forces such as thunderstorms, earth quakes, wind and the sun. We have two goals. First, we will provide cross-linguistic evidence for the hypothesis that whenever constructional options for animate and inanimate arguments differ, some natural forces regularly pattern with animates when occurring in agentive function. Examples are provided on the next page. Second, we show that not all natural forces behave in this way. Rather, some natural forces, e.g. the sun, regularly pattern with inanimates with regard to constructions sensitive to animacy distinctions. Furthermore, some natural forces (e.g. the wind) allow for alternative construals, sometimes patterning with animates, sometimes with inanimates. Consequently, the question arises what motivates the differing grammatical propensities of the two (or three?) classes of natural forces. We hypothesize that the ability for (forceful?) motion has a role to play.

The grammatical patterning of natural forces is of more general relevance, as it promises to provide further insights into which properties of animates makes them particularly good agents. In this regard, Lowder & Gordon (2015) claim that the natural forces at issue here are not only grammatically, but also cognitively processed like animate entities.

To support our claims, we present data from several unrelated language families (see next page).

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Examples

a) Turkish: Differential object marking

In Turkish, direct objects as in (1) are optionally marked with the accusative suffix *-(y)I* if the subject is animate. Inanimate subjects invoke a strong shift towards an accusative marking preference. Our observations from a forced choice study show that some natural forces like *storm*, *draft* or *river* grammatically pattern with animate subjects in allowing for optional marking (2). In contrast, others like the *sun*, *fire* or *quake* pattern like inanimate subjects in triggering an accusative marking preference on the direct object (3).

- (1) a. *Öğretmen bir karton(-u) kes-ti.*
teacher a cardboard-ACC cut-PST
'The teacher cut a cardboard.'
- b. *Makas bir karton^{??}(-u) kes-ti.*
scissors a cardboard-ACC cut-PST
'The scissors cut a cardboard.'
- (2) *Fırtına bir gemi(-yi) bat-ır-dı.*
storm a ship-ACC sink-CAUS-PST
'The storm sank a ship.'
- (3) *Güneş bir çorba^{??}(-yi) ısı-t-ti.*
sun a soup-ACC warm-CAUS-PST
'The sun warmed a soup.'

b) Western Austronesian languages: Limited-control constructions

In Western Austronesian languages, limited-control constructions such as the Tagalog one in (4a) are used when the ability of the agentive argument to control the eventuality expressed by the predicate is at issue. This construction generally excludes inanimate agents, as these, by definition, lack the ability to control eventualities. Nevertheless, some natural forces are allowed in them (cf. example (4b)).

- (4) Tagalog (Himmelman 2004:105)
- a. *na-dalá ko ang libró*
RLS.POT.PV-carried 1.SG.POSS SPEC book
'I took the book by accident.'
- b. *ang dahun ay na-dà-dalá ng tubig*
SPEC leaf PM RLS.POT.PV-RDP-carried GEN water
'The leaf was being carried along by the current, ...'

c) Tima: Middle voice constructions

A further example are middle-voice constructions in Tima (Niger-Congo). These constructions allow for constructions with animate agents (such as *ihwáà* 'people' in (5a)) but, generally, do not accept inanimate agents as subjects. However, an exception within inanimate agents are, again, natural elements such as *údí* 'water', which, just like animate agents, are judged acceptable in a construction like (5b).

- (5) Tima
- a. *ihwáà ì-cím-ǵl=á=ɬán*
people PAST-gather-MV=SOURCE=LOC3P
'the people gathered (at one spot)'
- b. *údí àn-cím-ǵl=á=ɬán*
PL:water 3P:PRF-gather-MV=SOURCE=LOC3P
'the water has gathered (in one place)'

Prosodic Phrasing and Syllable Prominence in Spoken Prose. A Validated Coding Manual

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Metrical grids are supposed to reflect relative syllable prominence (Lieberman & Prince, 1977), and partly account for the domains of the Prosodic Hierarchy (Halle & Vergnaud, 1987). However, their use for empirical studies is limited to highly controlled and short sentences. Also, current systems using metrical grids for syllable prominence prediction focus on decoding small verses (for poetry see Lerdahl, 2001), or on syntax/semantic-based automatic decoding of sentences that need to be annotated syntactically (Windmann et al., 2011). A replicable system for manually coding syllable prominence and prosodic boundaries in longer sentences or even texts is lacking so far, let alone its validation with the phonetic realization.

Based on work in the fields of metrical phonology (Kiparsky, 1966; Liberman & Prince, 1977) and existing prominence and pause coding systems (Gee & Grosjean, 1983; Windmann et al., 2011), we developed a manual for coding syllable prominence (yielding up to 9 degrees of prominence) and prosodic boundaries (with 6 degrees of juncture, including positions where a boundary is particularly unlikely). The manual consists of a set of rules that are to be applied in a prescribed order; these rules mainly refer to simple cues in the text, like word/syllable count, part of speech, word position and punctuation. The coding system is based on the understanding that syllable prominence and boundary strength determine each other (Franz et al., 2022).

Three independent annotators applied the coding system to the beginning pages of four different German novels (~90 000 syllables, Fleiss kappa .88). For the phonetic validation, eight professional speakers read the texts aloud. We annotated the speech signal automatically with MAUS (Schiel, 1999). Using PRAAT (Boersma & Weenink, 2019), we extracted F0 range and duration for each syllable and compared it to predicted syllable prominence (Figure 1-2). We further compared pause duration to predicted prosodic boundary strength (Figure 3). The validation with the speech signal shows that our annotation system reliably predicts syllable prominence and prosodic boundaries. In comparison to Gee and Grosjean (1983), who developed a system to predict pauses from text with an infinite number of boundary degrees, our system generates six degrees. This is comparable to GTOBI (Baumann et al., 2000) where the speech signal is annotated. Since our annotation works with plain text, there are additional potential applications of the coding system, covering synthetic speech and (psycho)linguistic research on prosody.

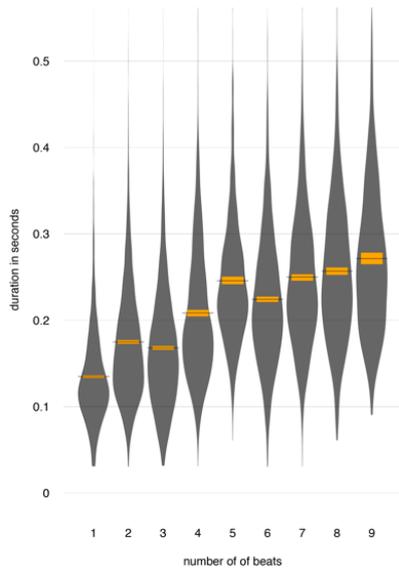


Figure 1: Syllable duration (in sec) by predicted syllable prominence (number of beats). The yellow bar shows the CI for the mean.

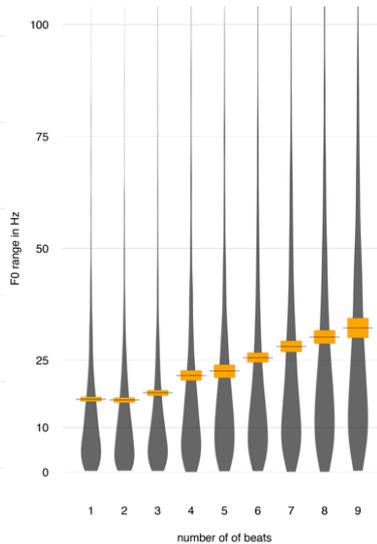


Figure 2: F0 range (in Hz) by predicted syllable prominence (number of beats). The yellow bar shows the CI for the mean.

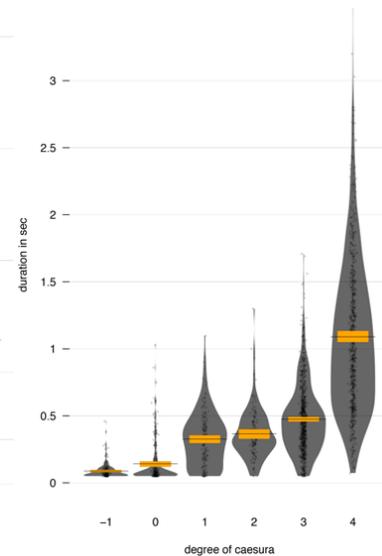


Figure 3: Pause duration (in sec) by predicted strength of prosodic boundaries (scale from -1 to 4). The yellow bar shows the CI for the mean.

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Prominence guides incremental interpretation: Lessons from obviation in Ojibwe

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Animate nouns are more likely than *inanimate* nouns to be interpreted as agents under incremental ambiguity (e.g. Gennari & MacDonald, 2008; Wagers & Pendleton, 2016; Wagers, Borja, and Chung, 2018). Here, we investigate how an understudied type of prominence information, *obviation*, affects processing. Obviation organizes *animate third persons* by their discourse prominence: A third-person entity “in the spotlight” is PROX(IMATE), while all others are OBV(IATIVE). Like person and animacy, obviation can be described through the *Person-Animacy Hierarchy* (1; PAH).

(1) 1/2 (PARTICIPANTS) > 3 (PROXIMATE) > 3' (OBVIATIVE) > 0 (INANIMATE)

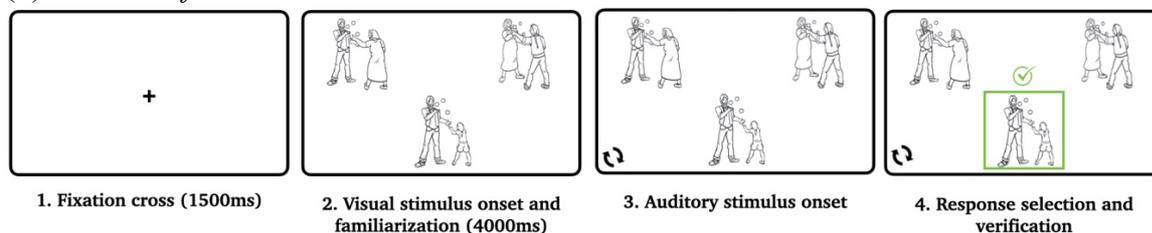
We present a study of real-time processing in Ojibwe to ask **whether the PAH is generally employed in comprehension, with higher-ranked nouns more likely to receive agent interpretations.**

Our stimuli (2) are RCs crossing two factors: HEAD obviation (PROX/OBV) and VOICE (DIR/INV). Obviation and voice codetermine interpretation: DIRECT (-aa) indicates PROX acting on OBV, and INVERSE (-igo) the reverse.

- (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}’

There is a period of ambiguity where the obviation of the head noun is known, but the disambiguating voice information is not. We used eye-tracking while listening to **assess preferences to interpret the head noun as an agent** under ambiguity. 16 speakers of Ojibwe participated in the task schematized in (3). In the two critical images the head noun was either the agent or patient. After familiarization, a sentence played. Participants selected the image associated with their interpretation via a touch screen.

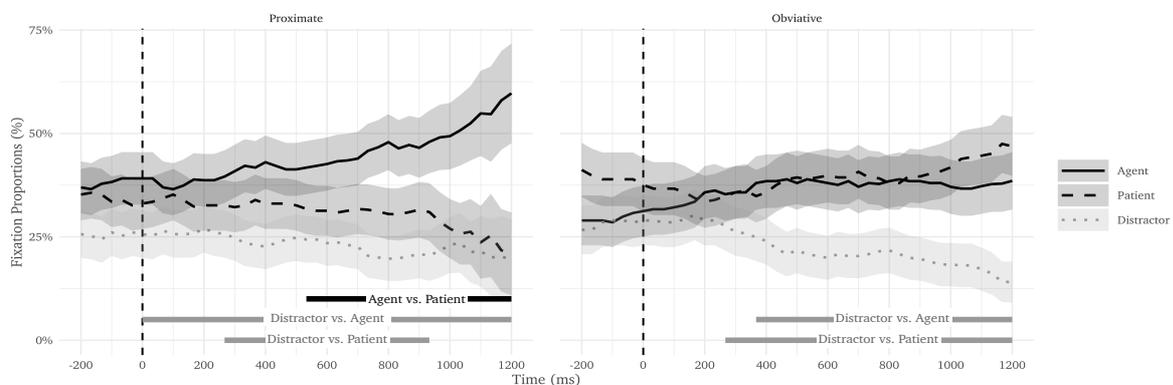
(3) *Outline of task.*



Looks towards each image during the ambiguous region, collapsed across levels of VOICE (not yet encountered in the sentence), are in (4). Cluster-based permutation tests (Barr, Jackson, and Phillips, 2014) showed an effect of HEAD ($p = .005$), driven by increased looks towards the agent image after proximate heads ($p = .013$). There were no differences following obviative heads. This finding suggests that **PROXIMATE nouns are more likely to be incrementally interpreted as agents.**

A logistic mixed effects model of picture selection accuracy (5) revealed a main effect of HEAD ($p < .001$) 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. Bruening, 2005). This leads to increased accuracy via the “Subject Gap Advantage” (e.g. Kwon et al., 2010). The interaction between HEAD and VOICE suggests an *agent-first preference* (e.g. Bornkessel-Schlesewsky & Schlewsky, 2009): When the head is an agent, accuracy is high, perhaps because reanalysis is not necessary. This may also explain the *lack of looking preference with obviatives*: There is competition between pressures toward a patient interpretation (PAH), and towards an agent interpretation (agent-first preference). Overall, **the findings support a model where prominence effects are unified under the PAH**, with similar effects appearing with different types of prominence information (i.e. animacy, obviation) and across typologically diverse languages (e.g. Indo-European, Algonquian).

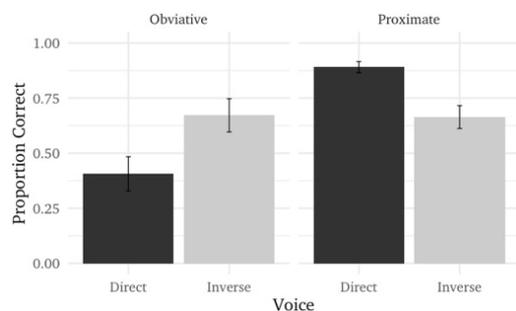
(4) Critical ROI looking results



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		0–133	-7.60	0.185
	Proximate	267–933	-38.52	*0.010
	Obviative	0–100	-5.96	0.221
		267–1200	-96.87	* < 0.001

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

(5) Picture selection results



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

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Making conversation work: Prominence in the intonation of feedback signals

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The importance of backchannels (BC) as other-oriented feedback signals is widely recognized [1, 2, 3]. BCs play an important role in constructing and maintaining shared knowledge in conversation. Tasks like the Map Task [4] are commonly used to elicit conversations that contain a large number of feedback signals. In this task, two participants collaborate to transfer a given route from one participant's map to the other without any visual contact, i.e. using only spoken language. In order to solve the task without seeing the interlocutor's map, a clear understanding about what is *common ground* (shared knowledge between interlocutors) [5] is indispensable. In spontaneous speech, on the other hand, absolute certainty about the current status of common ground is not quite as important from a strictly functional perspective [6], and BCs might therefore be seen here to serve a wider range of social functions [7].

BCs are often classified according to their function as *acknowledgement tokens* (typically with falling intonation) or *continuers* (typically with rising intonation). To investigate the interplay of the intonation of backchannels with different conversational settings, we conducted a pilot study, using recordings of two dyads of monolingual German speakers in two settings. Subjects were recorded first while having a spontaneous conversation, and then while taking part in a Map Task. It is important to note that the visual channel was available only in spontaneous conversations.

A first exploration of our data set (Map Task: 198 BC tokens; spontaneous: 37 BC tokens) shows that in task-oriented conversation, speakers use more 'standard' BC types like "ja", "mmhm", and "okay" as compared to spontaneous speech, where almost a quarter of all utterances were 'non-standard' BC types (subsumed under the category "other" in related work [8]). For the prosodic analysis, we categorized intonation contours into rising, falling and level contours by measuring the difference in semitones between the beginning and end of each token. We found that intonation contours differed according to conversational setting. Table 1 shows that, in task-oriented conversation, speakers used predominantly rising tokens (53.1%) while in spontaneous conversation most tokens were produced with falling or level intonation (fall: 45.9%, level: 40.5%). Moreover, we found that BCs in task-oriented conversations have greater intonational salience in terms of greater overall pitch excursions (2.84 ST averaged across tokens) as compared to those in spontaneous conversation (0.94 ST averaged across tokens), as shown in Figure 1 and table 2.

These findings suggest that backchannel use differs between task-oriented and spontaneous conversations. While in Map Tasks there is an inherent, functional motivation for interlocutors to continuously update and confirm the current status of common ground using continuers with prominent pitch movements [9], spontaneous conversation does not necessarily require the same degree of precision and speakers seemed to use more subtle pitch movements on their feedback signals. Subjects also used a greater variety of lexical types in spontaneous conversation, suggesting that, overall, BCs are used in a more varied and flexible manner in the absence of a constraining and goal-oriented conversational context.

Figure 1: Pitch movement in semitones for individual BC tokens in spontaneous and Map Task conversation. Cyan diamonds represent mean values, positive values represent rising contours, negative values represent falling contours.

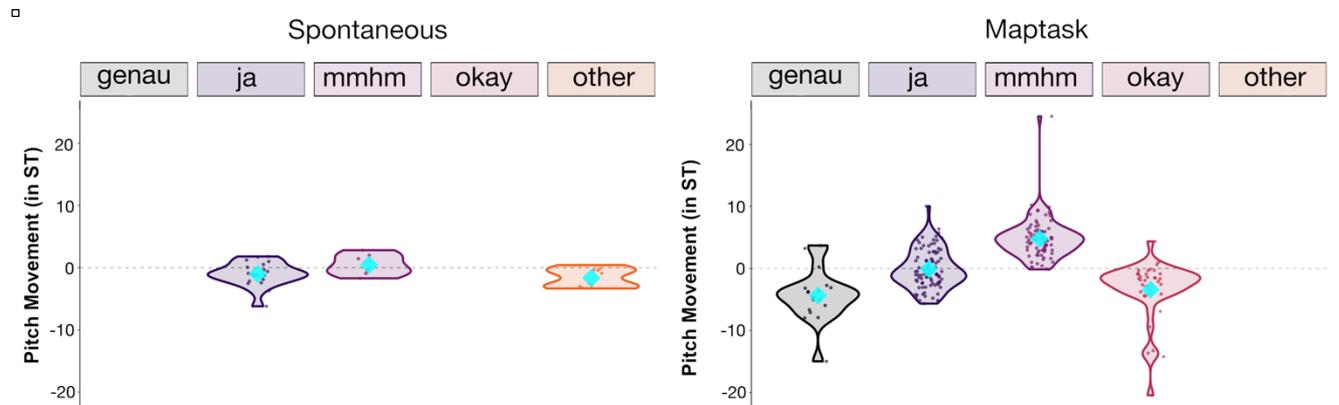


Table 1: Proportions of intonation contour by condition

	Fall	Level	Rise
Map Task	30.6 %	16.3 %	53.1 %
Spontaneous	45.9 %	40.5 %	13.5 %

Table 2: Mean values of rising and falling contours in semitones by condition and BC type (standard deviations in brackets)

	Ja	Mmhm	Genau	Okay	Other
Map Task	-0.18 (2.95)	4.82 (3.34)	-3 (3.54)	3.37 (5.11)	-
Spontaneous	-1 (1.91)	0.18 (1.51)	-	-	1.64 (1.49)

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The interaction of tonal and metrical prominence in the Pingding dialect of Chinese

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The present study addresses the question of how metrical prominence is realized in tonal languages. The data come from a field study conducted in 2019 on the Chinese dialect of Pingding, part of the Jin dialect group, which is spoken in an area surrounded by Mandarin varieties (CASS 2012). It has often been claimed that tonal languages do not have word stress or metrical prominence, and that lexical tone and word stress are mutually exclusive features (cf. the discussion in Hyman 2006; but see Hyman 2014 for counter-arguments; cf. Sui 2016 on Chinese). This study aims at showing that metrical prominence interacts with tonal prominence, as is visible in the form of tone deletion in metrically weak, but (underlyingly) tonally prominent syllables in the Pingding dialect of Chinese. The generalizations on tone deletion receive a straightforward analysis if we assume (i) that metrical prominence is on the leftmost syllable of a phonological word, and that tones are ordered along a scale of tonal prominence, (4), where contour tones are more prominent than level tones and high tones are more prominent than non-high tones.

Firstly, the Pingding data show that if, in a phonological word, the citation tone of a metrically non-prominent ("unstressed") syllable is more prominent than the tone of the metrically prominent ("stressed") syllable, the tone of the "unstressed" syllable is deleted; (1a), so that the citation tone pattern MF-HF is realized as MF-o ('o' referring to the tone which is deleted). However, tone deletion does not apply in phonological phrases with the same tonal pattern; (1b).

Secondly, tone deletion is applied only if the "unstressed" syllable bears a citation tone which is more prominent than the citation tone of the "stressed" syllable. For example, in the citation tone sequence HF-MF, where the HF on the "stressed" syllable is more prominent than the MF on the "unstressed" syllable, both tones are preserved (but sandhi applies), in phonological words as well as in phrases; (2). The same phenomenon can be observed in (rare) trisyllabic sequences and even longer monomorphemic lexemes, deleting (all and only those) tones which are more prominent than the tone of the "stressed" syllable; (3).

The tonal prominence hierarchy of this dialect is compatible with standard assumptions on the cognitive saliency of high tones and contour tones, which are more salient than low tones and level tones, see (4) (Jiang-King 1996; Jiang-King 1999; de Lacy 2002; Zhang 2007). The data from Pingding thus constitute another piece of evidence that both lexical tone and metrical prominence at the level of the phonological word can coexist in one phonological system, where metrical prominence can be perceived by the speaker as tonal prominence (and is thus learnable). If underlying tonal prominence does not align with (surface) metrical prominence, tone deletion applies, with metrical prominence winning over tonal faithfulness. The analysis we present for the data is cast in the framework of Optimality Theory.

Examples

- (1) a. Phonological word MF-HF→MF-o (tone deletion)
yao-gu [iə³¹ku⁵³⁻²²] “waist-drum” Noun
xin-ku [ɕiəŋ³¹k^hu⁵³⁻²²] “hard” Adj
an-wen [ŋæ³¹vəŋ⁵³⁻²²] “sedate” Adj
 b. Phonological phrase MF-HF→MF-HF (no tone deletion)
zhe-yu [tʂɤ³¹y⁵³] cover + rain “to keep out the rain” Verb + Obj
zhua-jin [tsua³¹teiəŋ⁵³] hold + tight “grasp firmly” Verb + Adv
- (2) HF-MF→HH-MF (no tone deletion, but sandhi in the form of contour dissimilation)
 a. Phonological word
shou-jin [ʂə⁵³⁻⁵⁵teiəŋ⁴²] “towel” Noun
qi-feng [tehi⁵³⁻⁵⁵fəŋ⁴²] start + wind “gut” Verb + Obj
 b. Phonological phrase
yan-hua [iæ⁵³⁻⁵⁵xua⁴²] eye+dim “have dim eyesight” Subj + Predicate
- (3) *yang-gao-feng* [iaŋ²²kə³¹⁻²²fəŋ³¹⁻²²]
 LL-MF-MF → LL-o-o lamb+crazy “epilepsy” Modifier +head
duo-lun-duo [tux³¹luəŋ²²tux³¹⁻²²]
 MF-LL-MF → MF-LL-o “Toronto”
- (4) Tonal prominence hierarchy HF>>MF>>LF/LFq>>LL/Lq
 (HF: high falling tone; MF: mid falling tone; LF: low falling tone;
 LFq: low falling checked tone; LL: low level tone; Lq: low level checked tone)

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Grammar-external and structural factors predict the rate of forestressing in African American English: A corpus study

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Prosody is arguably one of the most understudied areas in sociophonetic research on African American English (AAE). While prosodic cues have been claimed to be vivid markers of ethnic identity (Thomas 2015), there is little research on how AAE prosodic variants may have been socially indexed in different regions of the USA since earlier studies, in thrall of the “supraregional myth”, assumed homogeneity in AAE speech (Farrington, King and Kohn 2021).

Here, we focus on one such prosodic feature, forestressing (henceforth FORESTR), which is a well-known albeit under-theorized variant of AAE prosody. FORESTR refers to the placement of primary stress on the initial syllable of words that carry non-initial stress in many mainstream varieties of English, e.g., *pólice* (AAE) vs. *police* (General American). Accounts of FORESTR suggest that it is stratified by language-external factors such as age, region and socioeconomic status (Thomas 2015). As for language-internal constraints, Baugh (1983) notes that especially CV.CVC structures promote FORESTR. However, most such observations stem from anecdotal evidence and systematic data are lacking. Similarly, little is known about which other structural factors, predicted to circumscribe FORESTR on typological and diachronic grounds (e.g., part of speech, word segmental structure, and word prosodic makeup), modulate FORESTR in AAE.

The dearth of empirical studies arguably arises from methodological challenges since this variant results from a mismatch to an otherwise uncommon prominence pattern in English: Non-initial stress is rare in content words (e.g., Cutler & Carter 1987). As such, an empirical analysis of FORESTR requires systematic backtracking of AAE deviations to an arbitrary set of words that bear non-initial prominence in other varieties. Furthermore, as a receding feature (at least of urban Southern American English, which shares other features with AAE, Tillery & Bailey 2004), large sets of spoken data are needed to detect patterns at the intersection of phonology and sociolinguistic notions.

Here we present results from a comprehensive analysis of FORESTR using the *Corpus of Regional African American Language* (CORAAL; Kendall & Farrington 2021). Based on a list of 84 carefully selected words, we impressionistically coded 3200 tokens for stress placement, only ca. 5% of which exhibit FORESTR. The results of our logistic regression analyses show that the degree of FORESTR is modulated by speaker’s region and year of birth, with the variant being more prevalent in southern regions and in the speech of older speakers. FORESTR is also more common in nouns and heavy initial syllables that are specified to carry secondary stress.

We argue that the structural factors that reliably predict FORESTR in the CORAAL data are also attested in word prominence patterns crosslinguistically as well as in other synchronic varieties of English. We suggest that the high density of pitch accents in AAE (Wolfram & Thomas 2002, McLarty 2018) could be one of the factors that foster stress shifts to the initial syllable, especially in the form of stress reversals of primary and secondary prominence (Shattuck-Hufnagel, Ostendorf & Ross 1994). Furthermore, we take the significant correlation of FORESTR with such factors as generation as well as region in the data to suggest that the variant is in rapid decline among AAE speakers while projecting a residual association to the American South. At first sight, the overall decline in FORESTR may be seen as a sign of convergence to General American lexical stress norms. Concurrent with AAE’s distinct pitch accent patterns,

however, it may also indicate a possible alignment with an emergent supraregional accentual norm bereft of strong regional associations (see also Wolfram & Thomas 2002, who show that AAE speakers from Hyde County not only abandon regional features but also adopt new features associated with AAE supraregionally).

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Discrete and continuous-valued prosodic cues to prominence perception in Albanian
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Prominence as a perceptual phenomenon is influenced by many factors [1], but little is known about how these factors interact in the course of communication [2,3]. This study explores prominence/boundary perception using Rapid Prosody Transcription [4], by looking at how naïve Albanian speakers perceive prosodic prominences/boundaries. [5,6] have suggested that prominence in Albanian is marked both by the head (mainly L* for non-focused and L+H* for focused items) and the edge of the phrase, which is either an accentual (Ha, La) or an intonation phrase. [7] has shown that some morpho-syntactic factors affect listeners' prominence/boundary perception. Following this, the present study expands our knowledge by investigating whether listeners' perceptions are affected by: a) the presence/absence of discrete intonational categories (pitch accents/boundary tones) and b) syllable, vowel, and word duration.

Similar to [7], the analysis for this study used productions from two male and two female speakers. Twenty short (~20-second) sound files were taken from longer interviews wherein speakers described 2-picture story sequences (from QUIS [8]). 26 naïve listeners participated in the RPT experiment via Percy [9]. Following RPT methods, a text transcript of each file was displayed, with words separated by spaces, but no punctuation. Participants listened and clicked on words a) if they perceived them as highlighted in relation to surrounding words or b) if they perceived a boundary after them. For each word, two continuous-valued prosody features were calculated: the proportion of transcribers who marked the word (the p-score) and/or a boundary (the b-score) as prominent.

This study tested whether listeners' perceptions a) were affected by the presence/absence of pitch accents and boundary tones present in AlbToBI [5,6] provided by two trained annotators and b) whether syllable, vowel, and word duration played a role in listeners' prominence perceptions. Fleiss' K scores were calculated and showed that agreement was higher for b-scores (kappa = 0.62) than p-scores (kappa = 0.32), a result found in many RPT studies so far [10]. With respect to the role of prosodic factors in prominence perception, this study found that mean p-scores increase as a function of accent type, starting with no accent, L* and L+H* pitch accent (Fig. 1). Similarly, b-scores increase as a function of boundary type, starting with no boundary, L%, Ha, La and H% (Fig. 2). The low b-scores for L% is related to the fact that listeners almost never marked the end of an utterance, given instructions to detect boundaries in the utterance. Importantly, this study found that word/syllable/vowel duration did not affect the choice of the word either a) having been labelled as prominent by a trained annotator (Fig. 3) or b) having been perceived as prominent by the 26 participating subjects (Fig. 4). In conclusion, this study shows 1) that prominence perception in Albanian is affected primarily through differences in F0 as in Tamil [11], and not by means of duration, and 2) that pitch accent and boundary tone distinctions in the AlbToBI annotation system [5,6] relate to the categories perceived by naïve listeners.

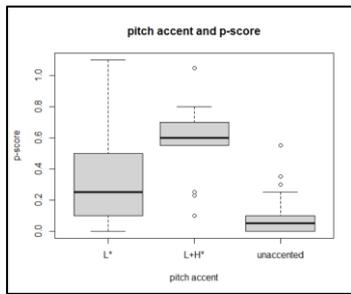


Fig. 1: p-scores as a function of pitch accent type.

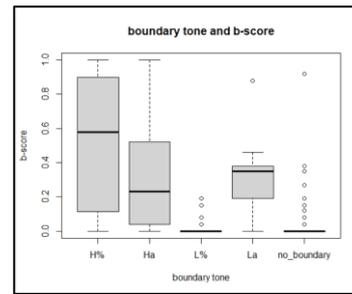


Fig. 2: b-score as a function of boundary tone.

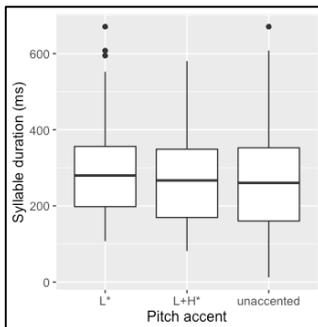


Fig. 3: Syllable duration as a function of pitch-accent type.

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Variations of focus prominence in three tone languages

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Prominence-marking constitutes an important dimension in prosodic typology [1]. However, this current framework characterises all tone languages as having head-prominence and does not account for variations in this aspect. Although tone languages prioritise tonal identity over pragmatically-driven f_0 changes, typological differences exist such as in post-focal compression [2]. The current study presents three distinctive types of prominence-marking found in closely related tone languages and suggests that the variations point to systematic differences in the prosodic function.

Three dialects from distinct Chinese language families were chosen: Guangzhou Cantonese, Chengdu dialect (a south-west Mandarin), and Changsha dialect (a Xiang variety). Prominence was elicited by embedding a target sentence with SVO structure in several focus conditions: (1) broad focus as an answer to the question ‘what happened?’ (2) subject focus induced by correction (3) object focus induced by wh-question (Changsha and Chengdu). The sentences were constructed in a way that the subject and object, excluding suffixes, have the same tonal category. A maximally dynamic tone reaching the ceiling of the tonal space was selected for analysis in the first instance, which is a high falling tone in Chengdu, and a high rising one in Changsha and Cantonese, since this would show the clearest peak and valley patterns in reaching the high target. Time-normalised f_0 was converted to semitones relative to 50Hz. Figure 1 presents preliminary results based on two repetitions of two males and two females in each dialect.

To avoid inaccuracies in determining the extrema, total f_0 movement was calculated as a replacement of pitch excursion, by adding up the absolute value of f_0 difference between successive normalised time points. Results show that under the subject focus condition, in Cantonese and Changsha, focus boosted the f_0 movement on the subject relative to the no-focus condition by 30% and 28% respectively, but by 149% in Chengdu. Total f_0 movement on post-focal position was reduced most drastically in Chengdu (-49%), followed by Changsha (-42%) and Cantonese (-24%). Under the object focus condition, the total f_0 movement resembled that of broad focus, except that the pre-focus subject in Chengdu also had greatly reduced f_0 movement (-43%). In summary, Chengdu showed clear boosted and suppressed prominence in different contexts, resembling standard Mandarin [3] but to a greater extent such that the suppression almost obscured the tonal target. On the other hand, total f_0 movement barely changed in Cantonese, in accordance with previous literature [4]. Changsha presented an intermediate type, where pitch was utilized in marking prominence as in Chengdu including post-focal compression, yet the tone target was always achieved.

The various degrees of f_0 movement involved in prominence marking can be explained in terms of different constraints on realising tonal targets [5]. As a potentially important typological dimension, we will show that it has reflexes in the prosodic structure both on the lexical and post-lexical level, leading to systematic difference in the realisations of neutral tone, tone sandhi, stress, prominence and rhythm. Results, including other phonetic features, from 16 speakers with three repetitions will be presented.

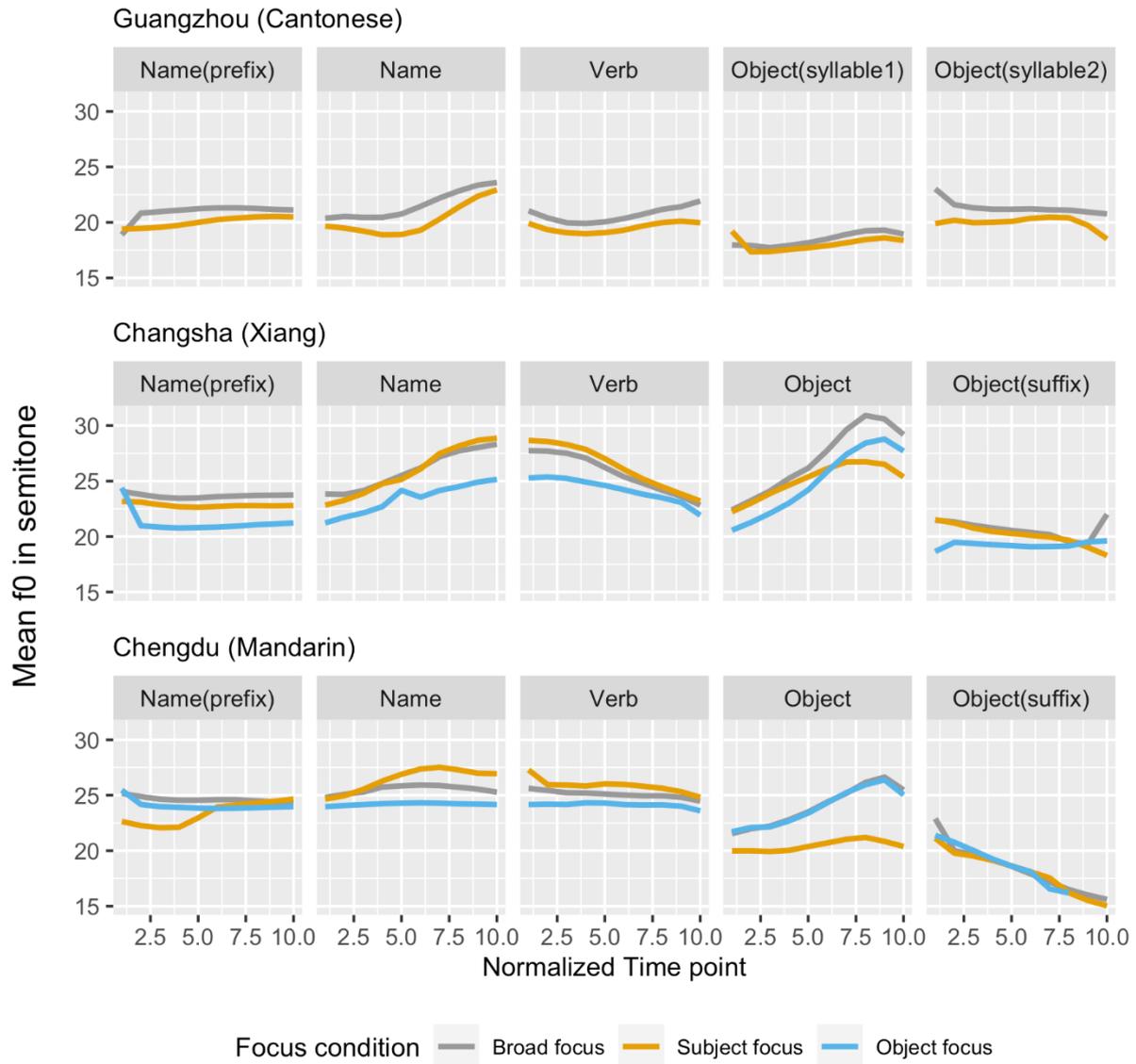


Figure 1. Average F0 contour over the time course of the target sentence. Sentences are of the form “name prefix+name+verb+(aspect marker)+object”.

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Prominence at edges? Some evidence from Maltese wh-words using periodic energy

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Maltese is a language with lexical stress and regular pitch accents as well as phrase accents, with secondary association to postnuclear stressed syllables, and edge tones [1]. Moreover, Maltese wh-words exhibit alternation in the tonal association conditioned by the question type in which they are embedded. Tones associate with the left edge of the wh-word in direct questions, and with the lexically stressed syllable in indirect and quoted questions (Fig.1 illustrates representative examples) [2,3,4]. This alternation holds regardless of the metrical structure of the word and seems to be pragmatically rather than phonologically conditioned [5].

Following [2], we investigate the relation between tonal association and prosodic strength in the two different tone bearing positions in Maltese wh-words (left edge association or head association). In a language that has pitch accents to cue prominence (a head prominence language according to [6]), the initial syllable, if not stressed, would not typically cue prominence, but rather juncture. Using the periodic energy mass metric (henceforth, mass) from the *ProPer* toolbox [7] as a measure of strength [8;9], we compare cases in which complex wh-words exhibit a falling pitch accent on the stressed syllable (indirect and quoted questions), to cases in which the wh-words bear an H tone at their left edge, i.e. word initially (direct questions). Our aim is to explore whether there are acoustic indications for a prominence cueing function of H tones associated to the left edge of wh-words. The difference between indirect and quoted questions is that in quoted questions, the wh-words are in narrow focus.

Comparing mass on word-initial and stressed syllables (see Fig.2), the model shows higher mass values on the stressed syllable across questions ($\delta_{\text{direct}} = 0.23$; $\delta_{\text{indirect}} = 0.44$; $\delta_{\text{quoted}} = 0.53$). For direct questions, the model suggests that there is no reliable difference between the word-initial syllable marked by an early H peak and the stressed syllable following it, but only a trend towards higher mass on the stressed syllable (CI [-0.68, 0.29], $P(\delta > 0) = 0.8$, evidence ratio = 4.09). For indirect questions, the model suggests an overall, even if not overly strong, tendency towards higher mass on the stressed accented syllable compared to the word-initial toneless syllable (CI [-0.91, 0.09], $P(\delta > 0) = 0.92$, evidence ratio = 12.07). Contrarily, in quoted questions, the model favours the interpretation of higher mass values on the stressed syllable as opposed to the word-initial syllable (CI [-0.99, 0], $P(\delta > 0) = 0.95$, evidence ratio = 18.46). Comparing word-initial syllables bearing an early H peak (direct) to toneless word-initial syllables (indirect) (Fig.2), the model shows a modest increase in mass on the word-initial syllable bearing a H peak ($\delta = 0.09$). Although mass differs between word-initial syllables with and without a tone, this difference is only very subtle, suggesting a weak but not reliable trend towards increased mass on the word-initial syllable with a H tone (CI [-0.11, 0.29], $P(\delta > 0) = 0.81$). Moving to stressed syllables, the model estimates only a slight difference between stressed syllables with flat pitch preceded by a H peak early in the word (direct) and stressed syllables bearing a falling pitch accent (indirect) ($\delta = -0.12$). In this respect, the model does not provide indications for a reliable difference between these two syllable conditions, but only a trend towards lower mass values on stressed syllables with flat pitch (CI [-0.34, 0.08], $P(\delta > 0) = 0.87$).

Overall, our results provide subtle rather than strong evidence of prosodic enhancement as a function of tonal association. In quoted questions, mass is undoubtedly greater across the whole wh-word compared to other conditions, presumably because narrow focus enhances the overall

mass on quoted wh-words, while the word-internal relations reflect greater prosodic strength on the stressed accented syllable as compared to the toneless word-initial one. Leaving aside quoted questions, our data does not provide unambiguous support in favour of mass enhancement in complex wh-words neither when the word-initial syllable carries an early H peak (direct) compared to toneless word-initial syllables (indirect) nor when the stressed syllable is marked by a pitch drop (indirect) compared to stressed syllables with flat pitch (direct). In both cases, we only see a subtle tendency of mass enhancement on the word-initial syllable marked by the early H peak as well as a subtle tendency for mass reduction of the stressed syllable when pitch is flat compared to when there is a fall in pitch. Hence, mass appears to remain constant, and generally unaffected by the intonational events on the wh-word, while the stressed syllable appears to preserve its prosodic strength in all cases.

In its most concise form, our main result can therefore be formulated as follows: in Maltese (at least in complex) wh-words, mass enhancement is not conditioned by tonal association (neither head nor edge) but rather by lexical stress. We found that the lexically stressed syllable preserved its prosodic strength, i.e., was always prosodically strong, independently of whether it bore a falling pitch accent or had level pitch. Moreover, the present study shows that the word-initial H tone does not affect the relative prominence between the stressed syllable and the word-initial one, and thus is unlikely to cue prominence on the initial syllable. It is nonetheless possible that the early H peak has a different prominence-related function, such as a prominence cueing function at the word level (i.e., to make the entire word more prominent in relation to other words in the utterance) [10;11]. Future research is planned to address this matter.

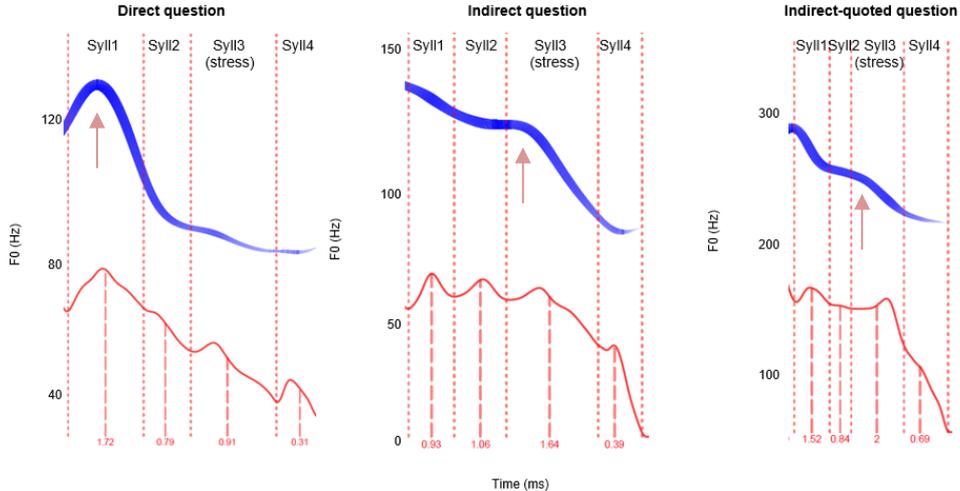


Fig. 1. Periograms and periodic energy curves of the complex wh-word “ma’ min minnhom” produced by a Maltese native speaker across question types. The dotted vertical red lines denote syllable intervals and the dashed vertical red lines depict the center of mass within intervals. Arrows refer to F0 inflections.

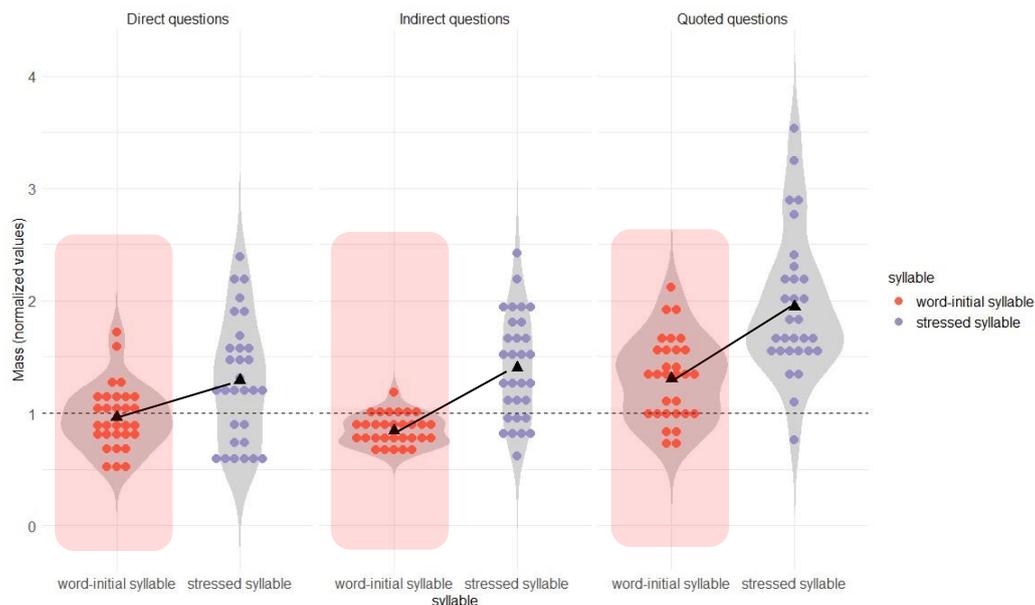


Fig. 2. Mass values ($1 =$ average strength) of word-initial and stressed syllables (x -axis) across *wh*-words as a function of direct (left panel), indirect (middle panel), and quoted (right panel) questions. Violin plots depict the distribution of the data. The width of each curve depicts the density of the data in each region. Points within violins illustrate individual data points for word-initial (in red) and stressed (in purple) syllables across *wh*-words. Black triangle points depict mean values across *wh*-words and speakers. Pink boxes facilitate comparison of word-initial syllables across conditions.

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Animacy as a prominence-lending feature in Lakurumau

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Following Himmelmann & Primus (2015), I define prominence as a relational property, which singles out one element from a set of elements of equal type and structure. Prominent elements are structural attractors, that is, they may license more operations than their competitors. Linguistic elements may be intrinsically prone to be prominent, because of their referential, semantic or grammatical properties, such as animacy, agentivity and subjecthood, which Heusinger & Schumacher (2019) label as “prominence-lending features”. In my poster, I examine the role of animacy as a prominence-lending feature in the morphosyntax and discourse in Lakurumau, a Western Oceanic language spoken in Papua New Guinea. All data come from a 19-hours corpus of Lakurumau natural speech (Mazzitelli 2017), as well as from my fieldwork notes.

Discussing phenomena such as plural marking, verbal agreement, encoding of alienable possessors and object incorporation, I show, that Lakurumau human and animate referents behave as structural attractors, being able to license more morphological and syntactic operations than their inanimate counterparts. In their turn, human referents license more operations than non-human animate referents.

In discourse, human referents are much more likely to be encoded in the prominent role of actors than animate and inanimate ones (in fact, a universal tendency; Haig & Schnell 2016), while inanimate objects in anaphora are routinely encoded as zero, while animate referents usually receive an overt pronominal encoding (4). In line with what observed by Du Bois (1987), Haig & Schnell (2016) and Schnell et al. (2021), Lakurumau displays a tendency to introduce new referents in discourse along a scale $O > S > A$. When we factor in animacy, however, we can see that human referents, actually, are equally likely to be introduced in discourse as A, S and O: their prominent status and their preference for the A role are strong enough to overcome the tendency of new referents of being coded as non-A.

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Crosslinguistic differences in the mapping of prominence between music and language

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One connection between musical and linguistic mental representations is the concordance of prominence patterns: When words and melody are brought together in music, phonetically stressed syllables strongly tend to fall on the strong beats of the musical meter (*STRESS-METER ALIGNMENT*, SMA), a well-known textsetting principle that also shows facilitatory effects in perception and memory [1]. Significant levels of SMA have been shown not only for languages like English, where stress is lexical [2], but also French, where word stress is controversial [3]. Despite vast typological variation across word-prosodic systems, the generalizability of SMA to other languages is lacking. Furthermore, languages realize acoustic prominence also by cues like increased duration and pitch, which may be shunted to musical notes as longer duration and higher notes. The extent to which languages exhibit these mappings, i.e. *STRESS-DURATION ALIGNMENT* (SDA) and *STRESS-PEAK ALIGNMENT* (SPA), also remains significantly understudied.

To develop a typological model of prominence pattern concordances between music and language, we asked (a) whether prosody-music alignment is generalizable to other languages, and (b) whether there is a correspondence between the weight of linguistic cues to prominence and the type of alignment found in the respective languages. We compared music-prosody alignment in lexical and predictable stress languages and compiled a database of children's songs in Russian (lexical) and Eastern Armenian (predictable final). The metrical value of each syllable was operationalized by assigning well-established musical prominence values to the syllable corresponding to each beat (Fig1). The melodic peak value of each syllable was calculated by adding up relative pitch in comparison to the preceding and following syllable (Fig2), also done for durational peak value. The degree of alignment for each of these values was computed by subtracting the mean of unstressed from the mean of stressed syllables only when they showed significant differences. These values are called *stress-meter alignment* (SMAV), *stress-peak alignment* (SPAV), and *stress-duration alignment value* (SDAV) respectively. To reach broader and gradient generalizations, these were compared to the raw data from [4] that investigated English (lexical) and Turkish (regular word-final stress).

Inferential statistics show that, in English, stress significantly aligns with meter (SMAV = 1.518) as expected [2] and duration (SDAV=0.776), but not melody. Russian, expected to pattern with English, exhibited significant alignment in not only meter (SMAV=1.586) and duration (SDAV=0.792) but also melody (SPAV=0.723). In addition to SMAV (0.53) and SPAV (0.988) [4], Turkish stress also aligned with duration (SDAV=1.419). Despite its similarity to Turkish, Armenian stress aligned only with duration (SDAV=0.736), but not with meter or melody.

Our findings reveal that the type and degree of alignment show crosslinguistic variation, not always accountable by notions like contrast and predictability. Instead, we propose an all-embracing typological model that takes into account not only phonetic, structural and syntagmatic properties of prominence but also its functional concomitants for cognitive processes. Our model thus complements previous approaches in showing that languages exhibit the parameters constitutive of prosodic prominence in variable degrees commensurate with their utility in a cognitive domain similar to but outside language.

Figure 1: Prominence values in 4/4 meter

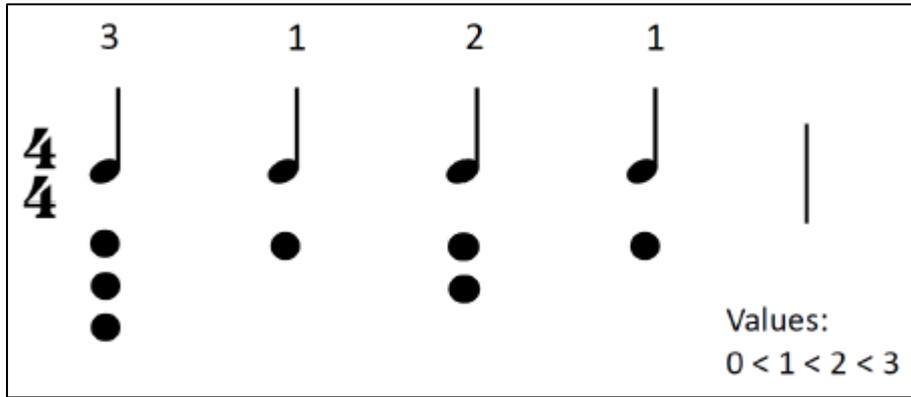
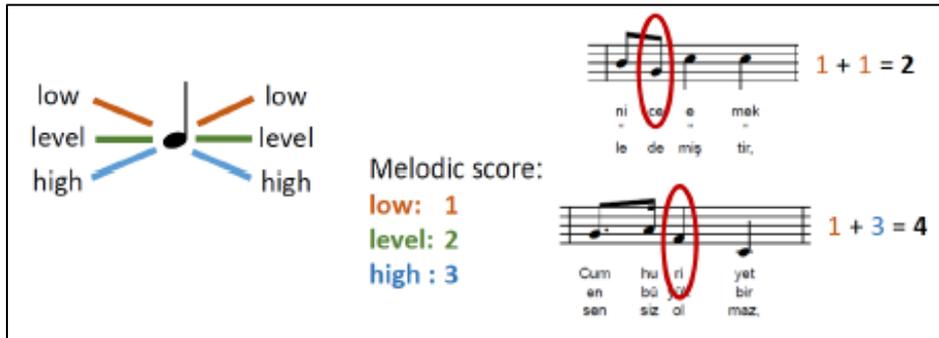


Figure 2: Melodic peak score



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Prominence levels and the symmetrical voice-to-transitivity shift

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Many researchers posit an association between the symmetrical voice systems found in the western area of the Austronesian language family and semantic or discourse transitivity, such that semantically highly transitive situations tend to be expressed by the undergoer voice (Riesberg et al. 2021 and references therein). However, the nature of this association remains poorly understood.

This paper will explore this issue from the perspective of different systems being sensitive to prominence at different levels of structure. In the Oceanic branch of Austronesian, the original symmetrical voice system has mostly been reanalysed into a system marking alternations in transitivity, with the original undergoer voice (UV) being reanalysed as the default transitive construction, and the actor voice (AV) as intransitive. This reanalysis involves a process of relinking, since the patient subject of the original UV becomes the object of the reanalysed transitive construction.

To understand how such a reanalysis might have taken place, I examine the Reefs-Santa Cruz group of Oceanic languages. One of these languages, Äiwoo (Reefs), is highly unusual for an Oceanic language in having retained a symmetrical voice system (Næss 2015, 2021); while the languages of Santa Cruz show systems of clausal organisation more like the canonical Oceanic pattern (Vaa 2013, Alfarano 2021). In the available Äiwoo data, the UV is vastly more frequent than the AV, suggesting that it may be on its way to being reanalysed as the default transitive construction. What, then, is the function of the AV? I examine usage patterns of the AV in Äiwoo and show that it occurs in a range of circumstances, which could be grouped under the heading of actor prominence according to Latrouite's (2011) analysis. The actor can be prominent at different levels, such as the discourse-structural, information-structural, or event-structural level; in Äiwoo, however, the majority of examples are found in contexts with indefinite or generic undergoer arguments, i.e. where the actor is more prominent than the undergoer at what Latrouite calls the referential level.

This increased weight of referential prominence, relative to other types of prominence, has potential consequences for the overall properties of the system. Referential prominence involves an inherent actor bias, as actors are more often referential, animate and human than are undergoers, and so increased importance of referential prominence in the system of voice choice may lead to an increased association between the actor role and subject function, giving rise to the relinking that has taken place in other Oceanic languages, including Äiwoo's closest relatives. But referential prominence is also a key property of transitivity as it is understood in the typological literature: a prototypical transitive clause does not simply involve reference to two participants, but two participants which are **thematically and referentially distinct** (e.g. Kemmer 1993, Næss 2007). That is, referential prominence may be a more central property in a system based on transitivity alternations than in one based on symmetrical voice alternations, where the presence of two referentially prominent arguments is not a prerequisite for encoding in a formally transitive clause. This might also point towards the aforementioned association between undergoer voice and transitivity, given that a definite and thus referentially prominent undergoer tends to trigger undergoer voice in symmetrical voice languages.

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Implicit causality biases in Turkish psychological state events

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How we identify the antecedent of an ambiguous pronoun has been a topic of interest in discourse anaphora studies. Crudely speaking, the most prominent entity is selected as the antecedent. Features such as topicality,^[1] givenness,^[2,3] focushood,^[3,4,5] parallel roles,^[6,7] recency,^[3] syntactic role,^[8] thematic role,^[9,10,11] verb type,^[10] coherence relations,^[13,14,15] verb valence (i.e., whether the verb has positive or negative meaning; connotation),^[16,17,18] and anaphoric expression^[3,19] have been nominated as possible determinants of prominence. However, how these factors interact is still an open question. For psychological state events (e.g., stimulus-experiencer, e.g., frighten; experiencer-stimulus, e.g., fear), the causal referents are likely to be re-mentioned in the upcoming discourse, and this leads to greater subject bias in verbs like *frighten* whereas greater object bias in verbs like *fear*. This bias, however, is not an absolute constraint on the interpretation of the pronoun^[20]. For Turkish, the intuition is that null pronouns are likely to refer to the subject and overt pronouns refer to the object^[21]. However, recent experimental studies show some verb types (e.g., action verbs) in Turkish may not reflect this expectation due to their strong thematic biases^[22]. In fact, stimulus-experiencer verbs are strongly biased towards the stimulus regardless of the anaphoric expression whereas experiencer-stimulus verbs are more malleable^[23]. In this study, we aim to replicate and extend a previous study^[23] by also manipulating several other factors to see how they interact.

We test how an ambiguous pronoun is interpreted in Turkish psychological state events (e.g., fear, frighten), and how verb valence (negative/positive) (manipulated within-subjects), anaphoric expression (null/overt), and word order (SOV/OSV) (manipulated between-subjects) influence interpretation. In a rating study, we asked Turkish participants (N=136) to determine the reference for a nonsense adjective in an utterance connected by a causal connector ‘because’ (Table 1). For the analyses, we used mixed-effect logistic regression with partially Bayesian regression, and we included random intercepts by participant and item, and random slopes of verb type by participant and word order by item. The results showed that there was greater stimulus bias in frighten-type verbs than in fear-type verbs ($\beta=1.25$, $z=7.04$, $p<.001$) (Figure 1). There was a trend for the effect of word order ($\beta=0.41$, $z=1.84$, $p=.06$), such that there was greater stimulus bias in OSV order than in SOV. This might be due to the combined effect of subjecthood and focushood. In fact, this trend was true only for fear-type verbs ($\beta=-0.63$, $z=-1.83$, $p=.06$) and only for overt pronouns ($\beta=0.69$, $z=1.80$, $p=.07$): The word order did not influence the stimulus bias in the frighten-type verbs as much as it did for fear-type verbs. Likewise, the word order did not influence the stimulus bias in the null pronoun condition as much as it did for overt pronouns. In other words, being in the focus position enhanced the subject’s prominence in fear-type verbs and in overt pronoun condition. We also found greater stimulus bias in the negative valence condition only for fear-type verbs ($\beta=-0.64$, $z=7.04$, $p<.05$) whereas for frighten-type verbs, valence did not change the stimulus bias. We conclude that Turkish psych-verbs attribute the cause to the entity in the stimulus role in frighten-type events; however, the semantics of fear-type verbs do not require a strong preference for causal attribution, which, in turn, makes fear-type verbs more malleable to external factors. We argue that this is because frighten-type verbs have more agentive properties, and they behave similarly to action verbs^[22]. Our findings highlight that pronoun resolution in Turkish is modulated by multiple factors such as word order, the type of anaphoric expression and the verb valence among others.

Table 1: Sample test items

(1)	a	SOV, Zero/Overt pronoun, Fear-type/Frighten-type verb, Positive-valence verb				
		<i>Bahar</i>	<i>Ceren-i</i>	<i>arzu-luyor/büyül-üyor</i>	<i>çünkü</i>	<i>(o) dakmuk.</i>
		Bahar-NOM	Ceren-ACC	desire/dazzle-PROG-3SG	because (she) dakmuk	
		‘Bahar desires/dazzles Ceren because she is dakmuk.’				
b	SOV, Zero/Overt pronoun, Fear-type/Frighten-type verb, Negative-valence verb					
	<i>Bahar</i>	<i>Ceren-i</i>	<i>kıskan-ıyor/üz-üyor</i>	<i>çünkü</i>	<i>(o) dakmuk.</i>	
		Bahar-NOM	Ceren-ACC	envy/upset-PROG-3SG	because (she) dakmuk	
		‘Bahar envies/upsets Ceren because she is dakmuk.’				
(2)	a	OSV, Zero/Overt pronoun, Fear-type/Frighten-type verb, Positive-valence verb				
		<i>Bahar’ı</i>	<i>Ceren</i>	<i>arzu-luyor/büyül-üyor</i>	<i>çünkü</i>	<i>(o) dakmuk.</i>
		Bahar-ACC	Ceren-NOM	desire/dazzle-PROG-3SG	because (she) dakmuk	
		‘Ceren desires/dazzles Bahar because she is dakmuk.’				
b	OSV, Zero/Overt pronoun, Fear-type/Frighten-type verb, Negative-valence verb					
	<i>Bahar’ı</i>	<i>Ceren</i>	<i>kıskan-ıyor/üz-üyor</i>	<i>çünkü</i>	<i>(o) dakmuk.</i>	
		Bahar-ACC	Ceren-NOM	envy/upset-PROG-3SG	because (she) dakmuk	
		‘Ceren envies/upsets Bahar because she is dakmuk.’				

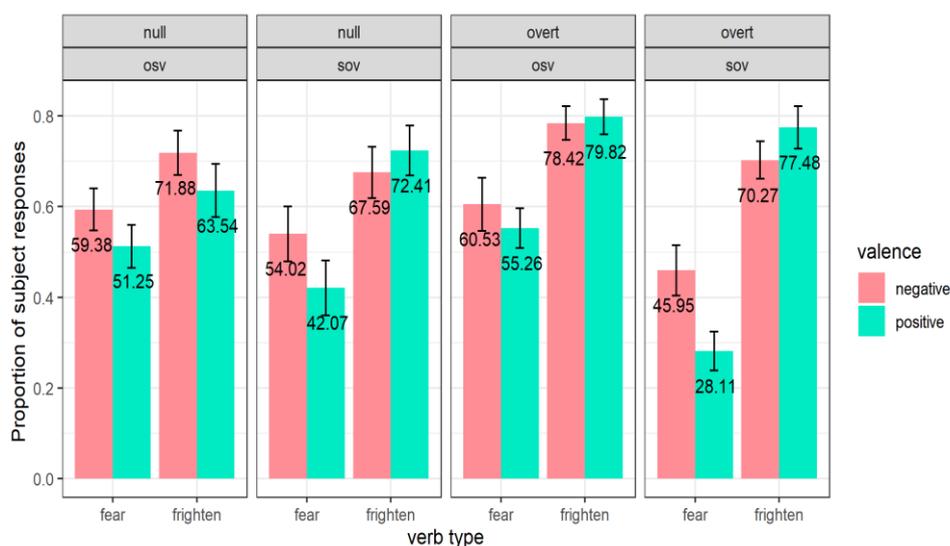


Figure 1: Subject preference in each word order, in each anaphoric type, in each verb type and valence. Error bars show the standard error of the mean.

References: [1] Givon (1983); [2] Gundel, Hedberg, and Zacharski (1993); [3] Arnold (1998); [4] Cowles, Walenski, and Kluender (2007); [5] Kaiser (2011), [6] Smyth (1994); [7] Chambers and Smyth (1998); [8] Crawley, Stevenson, and Kleinman (1990); [9] Stevenson, et al. (1994); [10] Garvey and Caramazza (1974); [11] Arnold (2001); [12] Grosz, Joshi, and Weinstein (1995); [13] Hobbs (1979); [14] Kehler (2008); [15] Rohde, Kehler, and Elman (2006); [16] Rudolph and Försterling (1997); [17] Fiedler and Semin (1988); [18] Franco and Arcuri (1990); [19] Fedele and Kaiser (2015); [20] Hartshorne and Snedeker, 2013; [21] Turan, 1997; [22] Özge and Evcen, 2020; [23] Özge, Harsthorne and Snedeker, 2016.

Articulatory encoding of prominence in habitual and loud speech

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A key function of prosody is the distribution of prominences, which is influenced by the focus structure of an utterance (Cho & Mücke, 2020; Uhmann, 1991). Focus structure is expressed by changes in the acoustic signal (e.g. f_0 and sound pressure level) and in the underlying articulation of consonants and vowels (e.g. lip and tongue movements) (Baumann & Winter, 2018; Cho, 2004; Roessig & Mücke, 2019). Notably, focus structure affects the whole utterance and not merely the production of a prominent entity (Féry & Kügler, 2008; Rump & Collier, 1996).

The present study investigates the articulatory encoding of focus structure in habitual and loud speech. It examines modulations of lip kinematics in the most prominent entity of an utterance but, importantly, extends the analysis to a less prominent entity to inquire prominence marking from a comprehensive perspective. Furthermore, the study investigates whether prominence relations are articulatorily encoded in loud speech. This is interesting because loud speech is produced with a high degree of vocal effort, which may impede the rather subtle encoding of focus.

An experiment with 20 German speakers was carried out using 3D Electromagnetic Articulography, of which 10 have been analysed to date. The speakers were engaged in an interactive question-answer task with a virtual avatar. They produced target words containing the syllables /bi, mi/. Target words were embedded in carrier sentences in two utterance positions (initial or medial). Two focus conditions were elicited through the avatar's questions: In condition 1, both the initial and the medial word were moderately prominent (in broad focus); in condition 2, the medial word was emphasised (in contrastive focus) and the initial word was less prominent (in the background). This design made it possible to study an increase and decrease in prominence and therefore the relations between focus types.

Figure 1 displays the results for the Euclidean lip distance during the target vowel /i/ in two utterance positions, focus conditions and speaking styles. In habitual speech, lip opening increases when prominence increases, i.e. in contrastive as opposed to broad focus (cf. panel A). Concurrently, lip opening decreases when prominence decreases, i.e. in the background as opposed to broad focus (cf. panel B). The same qualitative pattern can be observed in loud speech (cf. panels C/D), with an overall larger lip opening (cf. panels A/B vs. C/D). Interestingly, the differences between prominence degrees appear even larger, showing that prominence relations in lip aperture are not only preserved but enhanced – despite the fact that the lips are already generally opened wider in loud speech.

In summary, the study shows that prosodic prominence is encoded by systematic changes in supra-laryngeal articulation. Crucially, not only are those entities strengthened that are emphasised; at the same time, other entities are weakened, thereby potentially increasing the perceptual prominence of the strengthened entity. This can not only be observed in a habitual speaking style but even in loud speech. Our results underline the flexibility of the prosodic system adapting to communicative demands. These adaptations are best conceived of as the maintenance of parameter relations in a dynamical model of speech production rather than fixed, hard-coded parameter sets.

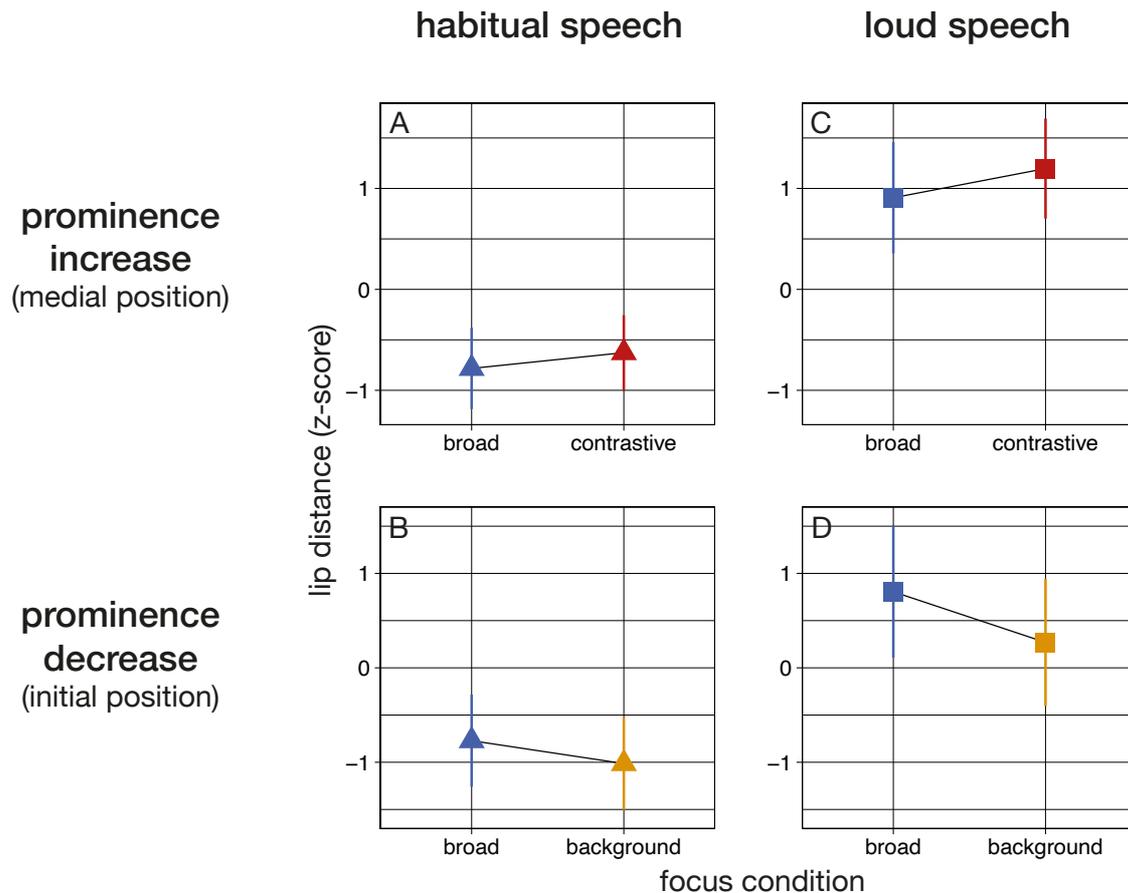


Figure 1: Lip aperture modifications under increased and decreased prominence in habitual and loud speech. Plot shows means and standard deviations of z-score Euclidean lip distance.

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Evaluative expressions influence prominence: effects on *die* and *diese* pronouns

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German has two main types of demonstrative pronouns — *die* (DPros) and *diese* (DemPros). However, it is not completely clear what functions differentiate them. Fuchs & Schumacher (2020) proposed that they differ in their referential shift potential such that DPros show robust whereas DemPros show a short-lived shift. Patil et al. (2020) showed that language formality is a distinguishing feature such that DPros prefer informal whereas DemPros prefer formal language. Zifonun et al. (1997) using the contrast between DPros and DemPros in (1a-b) suggested that DPros can refer to the information structurally prominent, i.e. topical, referent (*Peter*) as well as the less prominent (non-topical) referent (*Benz*) but DemPros can only refer to the closest possible referent, *Benz*, which makes the DemPro continuation in (1a) implausible (see Patterson et al. (2021) for experimental evidence of the last-mentioned preference for DemPros). However, if we consider (1c), it is clear that both demonstrative pronouns cannot refer to the topic. We hypothesize that in (1a) DPro can refer to *Peter* because it involves an evaluation of *Peter* by the (abstract) speaker, thereby making the speaker more prominent than this referent (as proposed by Hinterwimmer and Bosch, 2017). DemPros, in contrast, are not sensitive to the prominence modulation resulting from evaluation of the discourse referents.

METHODS To test the hypothesis we designed an acceptability rating study (n=114) in a 2x2 design — pronoun type (DPro vs. DemPro) and evaluation (evaluative vs. neutral sentences), using a 7-point Likert scale. Half of the items had negative and the other half had positive evaluations. We also tested the effect of the degree of evaluation (mild to strong evaluation). For each item in evaluative-DPro condition, we collected ratings of the degree of evaluation on a scale from -10 (extremely negative) to +10 (extremely positive) from four native speakers. The data was analyzed using the mixed-effects ordinal regression in the Bayesian framework (Bürkner & Vuorre, 2019) and the inferences are made using the 95% credible intervals around the estimates.

RESULTS The results are summarized in Fig. 1 in terms of the mean rating for four conditions. There were no main effects, but a reliable interaction between pronoun type and evaluation. Pairwise comparisons showed that the evaluative-DPro condition was rated higher than the other three. All other pairwise comparisons showed no statistical difference. There was no reliable effect of evaluation type (positive/negative). We also found that there was an interaction between condition and the degree of evaluation (Fig. 2): the evaluative-DPro condition showed an increase in acceptability with an increase in the degree of evaluation whereas the evaluative-DemPro condition did not show any reliable effect of the degree of evaluation.

CONCLUSIONS (i) DPros can refer to a discourse referent that is information structurally prominent (topic) when the (abstract) speaker is prominent as perspective-taker (ii) in contrast DemPros are not sensitive to prominence manipulations through perspective taking, and (iii) prominence in terms of perspective taking can be influenced by evaluative expressions and, also be modulated by the degree of evaluation.

LINGUISTIC EXAMPLES

(1)

a. Peter will einen Benz kaufen. **Der** /***Dieser** hat wohl zu viel Geld.

‘Peter wants to buy a (Mercedes-)Benz. **He** apparently has too much money.’

b. Peter will einen Benz kaufen. **Der** / **Dieser** soll aber nicht so teuer sein.

‘Peter wants to buy a (Mercedes-)Benz. But **it** should not be too expensive.’

c. Peter wollte einen Benz kaufen. ***Der** /***Dieser** fuhr gleich morgens zum Autohändler.

‘Peter wanted to buy a (Mercedes-)Benz. **He** drove to the car dealer right in the morning.’

(2)

Sentence 1 (same across all conditions): Maria hat Peter geohrfeigt. *Maria slapped Peter.*

Sentence 2:

Evaluative: Die / Diese hat sich einfach nicht im Griff! *She just can't control herself!*

Neutral: Die / Diese wollte die Rechnung nicht alleine bezahlen. *She didn't want to pay the bill alone.*

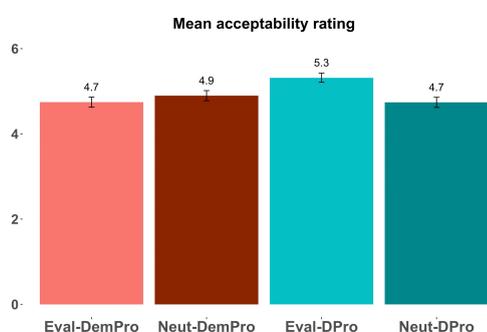


Figure 1: Mean acceptability rating for four conditions

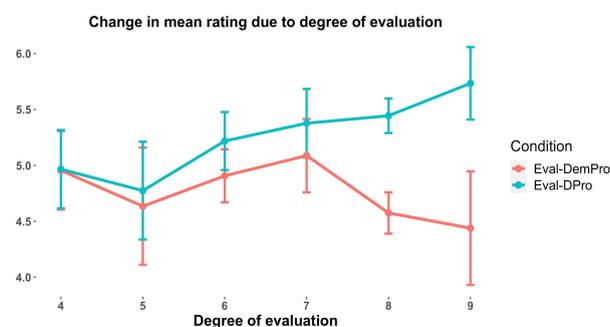


Figure 2: Change in mean acceptability rating as a function of the degree of evaluation across two evaluative conditions. X-axis numerically represents the degree of evaluations; the larger the number, the stronger the evaluation.

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How animacy and literacy affect picture naming

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Experiments on sentence processing reliably show effects of animacy on grammatical function assignment and word order. Whether animacy also effects language production at the phrase level is, however, less clear. Whereas a recent study [1] found that adults' and children's productions of N+N conjuncts were modulated by animacy, other studies have found no or no consistent effects of animacy on conjunct ordering [2, 3]. In the current study, we investigate whether the principle "the most animated NP precedes all other NPs" [4] also applies to coordinated NPs and how the effect might be influenced by speakers' reading/writing habits. Based on prior studies on spatial biases in scene perception and description [5, 6], we expect that the ability to read and write in the script of the spoken language influences picture naming and that in literate individuals the preferred sequence of naming may depend more on the directionality of the script than on animacy. We compared picture naming in 24 literate adult speakers of German (left-to-right script) (mean age 29 years), in 25 literate speakers of Arabic (right-to-left script) (mean age 33 years) and in 23 preliterate German-speaking children (mean age 59 months). All participants were presented with 30 picture sets of animate-inanimate entities depicted in grey shades (see Fig.1) and were asked to name the presented pictures. The position of the animate entity varied systematically between the right and the left side of the screen. Nouns depicted in the picture pairs were matched in terms of grammatical gender, syllable length and frequency in German. All participants were tested via a shared screen presentation in Zoom.

Figure 2, shows the mean proportion of responses per group where the animate item was named first in the N+N conjunct (e.g. *fish and shoe*): Proportions are plotted for each of the two positions (i.e., animate entity located on the left vs. the right). To examine whether reading and writing habits affected the order of mention during picture naming, we computed a mixed effects logistic regression model with language (German vs. Arabic) and position (animate left vs. animate right) as independent variables and order of mention (animate first – yes vs. no) as dependent variable. The model revealed a significant effect of position (Est. = 6.53, SE = 1.46, $z = 4.47$, $p < 0.001$) but no effect of animacy (Est. = -0.49, SE = 0.38, $z = -1.31$, $p = .19$), suggesting that for literate adults the position of an item is more important than its animacy status. Furthermore, the model revealed a significant interaction between language group and position (Est. = -16.96, SE = 3.03, $z = -5.60$, $p < 0.001$), demonstrating that German and Arabic speaking cohorts solved the task in different ways. Whereas German speakers mentioned the animate entity first when it was located on the left but not when it was located on the right, a reverse tendency was observed for speakers of Arabic (also see Figure 2). In contrast to literate adult speakers, for preliterate German children a mixed effect logistic regression model revealed a significant influence of animacy (Est. = 0.44, SE = 0.17, $z = 2.60$, $p = 0.01$) but no significant influence of position (Est. = 0.26, SE = 0.50, $z = 0.53$, $p = 0.60$). These findings suggest that for children who do not yet know how to read and write, the animacy status of an entity is (still) important and not yet affected by effects of literacy.

Taken together, our findings show that experience with a writing system has important consequences for the ordering of N&N conjuncts. In literate adult individuals, the order of picture naming is strongly influenced by reading/writing habits but not by the animacy of an entity. By contrast, our data on preliterate children indicates that this preference develops and that effects of animacy in adults possibly have been overwritten by effects of literacy.

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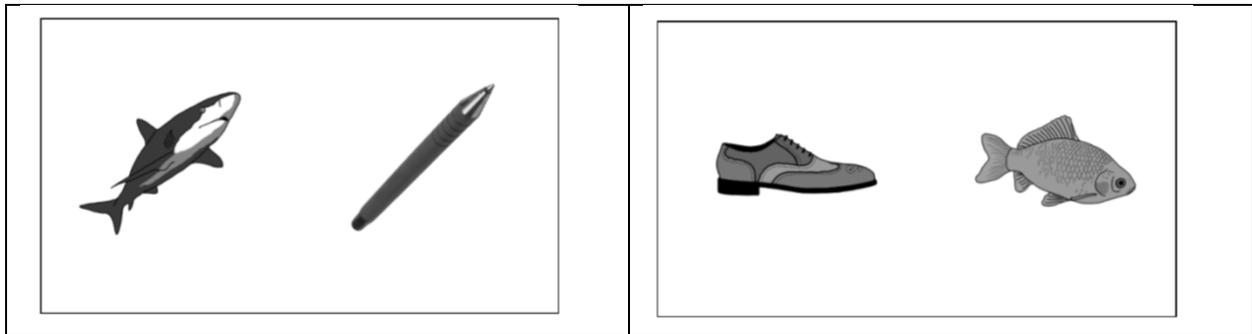


Figure 1: Examples of picture pairs presenting animate and inanimate entities

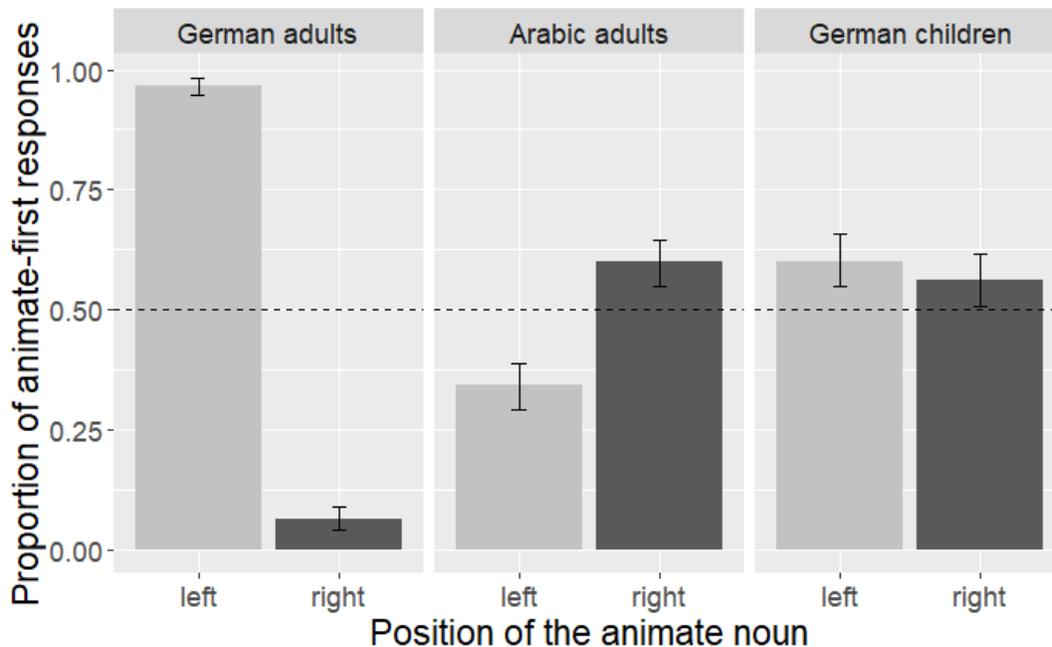


Figure 2: Proportion of animate-first responses for animate nouns in left vs. right position plotted for German adults, Arabic adults, and German children.

Patient prominence in German: Effects of accessibility and structural priming

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When faced with describing transitive actions, speakers of German have several structural options – active subject-before-object (SO; 1a), passive subject-before-object (1b), and active object-before-subject (OS; 1c) among them:

- | | | | |
|-----|----|---|--|
| (1) | a. | Der Polizist verhaftet den Dieb.
the policeman arrests the thief | <i>subject/agent before object/patient</i> |
| | b. | Der Dieb wird von dem Polizisten verhaftet.
the thief is by the policeman arrested | <i>subject/patient before object/agent</i> |
| | c. | Den Dieb verhaftet der Polizist.
the thief arrests the policeman | <i>object/patient before subject/agent</i> |

Psycholinguistic research on structural choices has shown that speakers are influenced by inherent conceptual accessibility: Animate entities tend to precede inanimate ones, resulting in passive productions when describing pictures including inanimate agents and animate patients (Branigan et al., 2008). Speakers are also influenced by syntactic structures themselves: As shown by structural priming (e.g., Branigan & Pickering, 2017), processing passives leads to enhanced passives rates in subsequent picture descriptions. In German, surprisingly, no significant effect of passive priming has been reported so far (Loebell & Bock, 2003). Turning from isolated sentence production to structural choices in context, a range of experiments has shown that derived accessibility – enhancing patient prominence in context – increases passive descriptions. Given the current literature, inherent and derived accessibility as well as structural priming seem to influence structural choices universally. Depending on the structural options (and task), speakers promote more conceptually accessible patients by using passives and/or active OS sentences. Perceptual accessibility via implicit priming, on the other hand, has shown mixed results (e.g., Esaulova et al., 2019). Whereas English as a rigid word order language shows consistent effects on structural choices (e.g., Gleitman et al., 2007), flexible word order languages (e.g., Finnish, Korean; Myachykov et al., 2010, Hwang & Kaiser, 2015) show no significant influence.

This paper presents a series of experiments investigating factors influencing patient accessibility and subsequent structural choices in German. Experiment 1 (structural priming using the classic paradigm, Fig. 1, + animacy manipulation) shows that speakers are more likely to produce passives for animate patient and inanimate agent events compared to events with two animate referents. The data also show that speakers are structurally primed (Fig 3). To the author's knowledge, this is the first demonstration of passive priming in German. Experiment 2 (structural priming of passive and OS sentences + animacy manipulation) shows again that passive productions are influenced by animacy as well as passive priming. A number of non-negligible active OS structures, however, was produced only when favored by both animacy and prime (Fig 4). In both experiments, the verb was repeated between prime and target, inducing a *lexical boost*. Experiment 3 (Fig. 2: implicit perceptual priming (cueing) + derived accessibility in an eye-tracking production study) shows that speakers of German use passive structures also to promote patients made more accessible via the prior context (i.e. patient questions). However, the data show no significant influence due to the cueing manipulation (Fig 5). Universal vs. language-specific influences of prominence (accessibility/salience/topicality/etc.) will be differentiated, discussing possible integration into models of language production.

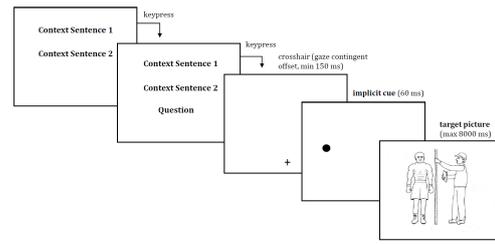
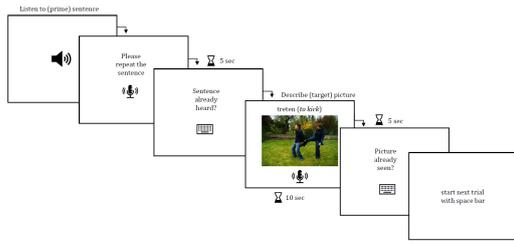


Figure 1: Priming procedure used in Exp 1 and 2. **Figure 2:** Procedure: Patient cued trial in Exp 3.

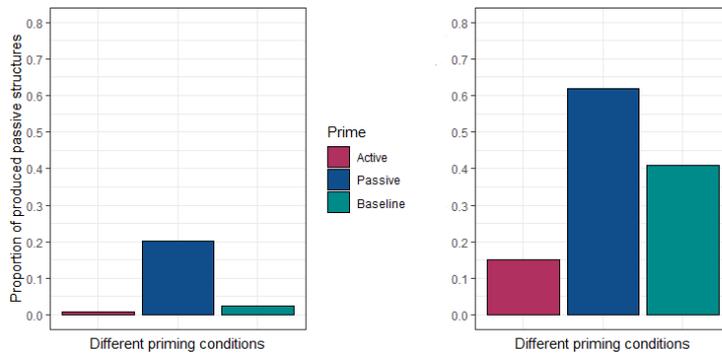


Figure 3: Exp 1: Proportions of passives in the different prime conditions.

Results for transitive events including animate (left) and inanimate agents (right). The patient was always animate. For baseline primes, intransitive structures were used. n = 30 speakers.

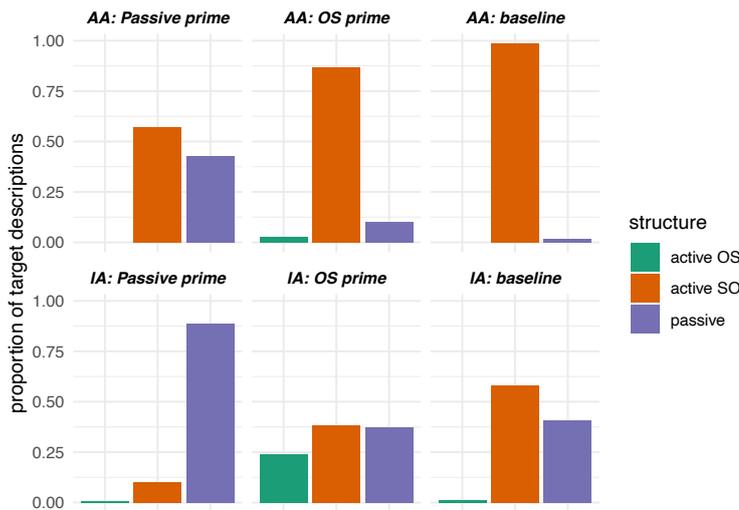


Figure 4: Exp 2: Proportions of target structures in the different prime conditions.

AA: animate agent, animate patient; IA: inanimate agent, animate patient. For baseline primes, intransitive structures were used. n = 38 speakers.

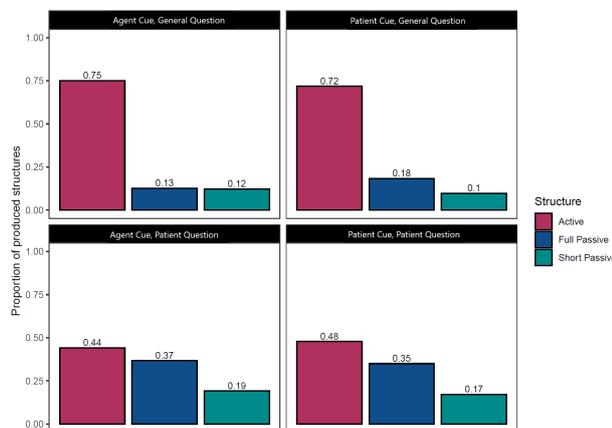


Figure 5: Exp 3: Proportions of produced target descriptions (active, full passive, and short passive structures) in the different conditions.

Left: Agent cueing following general context (top) or patient question (bottom). Right: Patient cueing following general context (top) or patient question (bottom). Contexts preceding questions were always *patient prominent*. n = 44 speakers.

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Testing the Inverse Relationship Between Lexical Stress Strength and Macro-Rhythm Strength

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In Jun's [1] model of prosodic typology, languages are classified based on how they mark word prominence. A word can be prominent by marking the head, such as with a pitch accent on the stressed syllable; the edge, such as with a boundary tone of a Prosodic Word (PW) or Accentual Phrase (AP); or both head and edge. She found that edge-prominence languages tend to have more rhythmic intonation patterns than head-prominence languages. These patterns of tonal rhythm are called macro-rhythm (MacR), and the typology categorized languages based on the degree of MacR strength. A language has strong MacR if its intonation regularly alternates between high and low tones over a word-sized prosodic unit in a phrase [1:522]. Jun further observed that languages with weaker MacR tend to have stronger acoustic correlates of stress, defined here as larger differences in duration and intensity between the stressed and unstressed syllables, while languages with stronger MacR tend to have weaker stress correlates. Therefore, she predicted an inverse correlation between the strength of lexical stress and the strength of MacR, reasoning that if word prominence is phonetically cued by pitch, then other cues such as duration and amplitude are less involved in cuing word prominence, and vice versa.

The current study tests this prediction in American English, Kolkata Bengali, and Uyghur. English is predicted to have the weakest MacR of the three languages because of its strong stress correlates [2] and its weaker MacR relative to other head-prominence languages [3, 4]. Bengali is predicted to have the strongest MacR because duration and intensity are not reliable cues for stress, which is fixed on the first syllable [e.g., 5]. Instead, stress is marked by F0 with a pitch accent on the stressed syllable (L*) followed by an AP edge tone (Ha), creating a rising tonal pattern [5, 6]. Uyghur is predicted to rank somewhere in between English and Bengali because lexical stress is acoustically marked by duration but not F0 [7, 8]. That is, Uyghur marks APs with a rising tonal pattern like Bengali but has no pitch accent on the stressed syllable [8], creating potentially contradictory prominence cues. A series of pilot experiments tested this predicted ranking in both production and perception, and the results of lexical stress production and MacR perception are reported here.

The lexical stress production experiment compared the duration ratios of stressed and unstressed vowels in 8 nonce disyllabic words in each language. Speakers from each language read short carrier sentences containing the target word in two prosodic conditions (accented and unaccented position). Duration ratios were log-normalized to account for speech rate [9]. Linear mixed effects models were run in R [10] with language and prosodic position as predictors and word and participant as random intercepts, and the results found that regardless of prosodic position, Uyghur had significantly smaller ratios than both English and Bengali, and there was no significant difference between English and Bengali ratios.

In the MacR perception experiment, 50 English participants listened to 30 phonetically manipulated sentences (10 utterances per language) two times in two conditions and rated how tonally rhythmic or "melodic" they sounded on a 5-point scale. A previous pilot study found that participants' responses differed depending on their musical background, so participants were asked at the start of the experiment about their music background, specifically whether they had formal music training (e.g., played an instrument or sang in a choir). The stimuli consisted of utterances taken from read speech corpora of each language [11, 12, 13] that were 13-20 syllables long and contained a single Intonational Phrase (IP). They were further

manipulated and presented in two conditions: Filtered and F0-only. In the Filtered condition, which was presented first, utterances were low-pass filtered to remove segmental information but still retained some information about syllable structure. In the F0-only condition, the same utterances were resynthesized as a continuous hum, retaining only the F0 of the original utterance. In each condition, linear mixed effects models were run with language and the participant’s music background as predictors, and the results found that English and Uyghur utterances were rated significantly less melodic than Bengali utterances but there was no significant difference between English and Uyghur, although English tended to have less melodic ratings than Uyghur in the F0-only condition (Figure 1). Rating responses were also affected by music background: participants who reported having formal music training rated English and Uyghur as significantly less melodic than Bengali, while participants with no music background did not have significantly different ratings between languages.

Taken together, these results suggest that the inverse relationship between lexical stress and MacR strength may be more nuanced in perception than in production. As expected, English had large duration ratios (corresponding to strong stress) and weaker perceived MacR, but while Bengali had the strongest perceived MacR, it also had larger than expected duration ratios. One possible explanation for this result is that participants may have treated nonce words differently than real words. Uyghur did not have stronger perceived MacR than English, which was surprising because, similarly to Bengali, it marks APs with a rising tonal pattern, so it was expected to sound more strongly macro-rhythmic than English. However, given that participants with no music background or training performed worse than those with musical training, this result may suggest that the stimuli were not ideal for testing this hypothesis. Another possible explanation for Uyghur data is that the Uyghur utterances had smaller and shallower rises on average than Bengali utterances, which could have contributed to the perception of Uyghur being less melodic despite having more consistent L/H tonal alternations than English. Therefore, the perception results may not fully reflect the MacR strength of each language. To further test the predicted inverse relationship, future work will quantify and compare MacR strength between the three languages in production data.

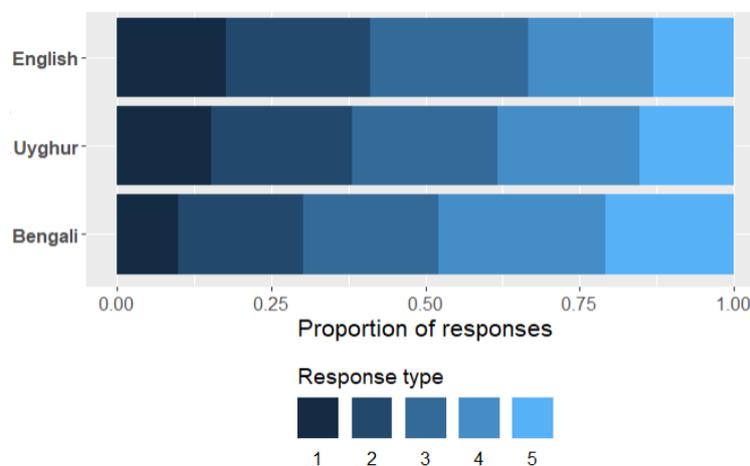


Figure 1. Proportion of rating responses of utterances in each language for the F0-only condition. 1 (darkest shade, left) = not melodic, 5 (lightest shade, right) = very melodic.

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Prominent protagonists influence discourse topicality

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Previous approaches to pronoun resolution have focused on various (interacting) features of the antecedent as governing factors of pronoun resolution. Demonstratives have been claimed to show anti-subject/-agent/-first-mention/-sentence-topic preferences (e.g., [1]; [2]); following a sentence containing two NPs such as “the policeman chased the criminal”, a demonstrative would normally refer to the NP2 “the criminal”. We explore the impact of the wider discourse on pronoun interpretation. We look at the German demonstrative pronoun (*dieser*) in comparison to the personal pronoun (*er*), investigating whether pronouns are influenced only by features associated with the antecedent in the immediately preceding sentence or whether they are additionally influenced by discourse topichood [3]. We predict an effect of the wider discourse: The likelihood of interpreting *dieser* with respect to the less prominent entity of the previous sentence (e.g., the NP2 as illustrated above) will decrease if the NP2 is the topic of the wider discourse. In that case the sentence-topic (NP1) is a potential candidate for *dieser*-reference, because it is less prominent in the overall discourse.

Two forced-choice referent selection studies were conducted to test resolution preferences in short stories (seven sentences long) in which two possible referents were available (see (1)-(8)). Two factors were manipulated: **Pronoun** (*er* vs. *dieser*) refers to the pronoun appearing in the final sentence; **Discourse topic** (NP1, NP2) refers to the discourse topic of the first five sentences being either NP1 or NP2 of the penultimate sentence. The experiments consisted of 12 items and 18 fillers. For **Exp.1** (n=56), items were divided into three story settings based on the novels *Harry Potter*, *Sherlock Holmes* and *Winnetou*. Probabilities of referring to NP2 are shown in Table1/Fig1. A generalized mixed-effects model revealed only a significant effect of pronoun ($z=13.47$, $p<.001$). This indicates that only local factors influenced interpretive preferences, supporting findings from studies with only one context sentence (e.g., [1]; [2]).

For **Exp.2** (n=113), we modified the stimuli to prevent a potential genre effect: The prominent proper names (e.g., *Sherlock*) were replaced by definite descriptions (*the policeman*) and the stories were no longer presented in story setting blocks. The model showed a significant effect of pronoun ($z=16.29$, $p<.001$) and an interaction of discourse topic and pronoun ($z=9.26$, $p<.001$). Models for *er* and *dieser* showed significant effects of discourse topic (*er*: $z=-8.39$, $p<.001$; *dieser*: $z=5.5$, $p<.001$). The data (Table2/Fig2) show that the demonstrative pronoun is less often interpreted as the NP2 (non-sentence-topic) of the previous sentence when this entity is the topic of the wider discourse.

The results from the two experiments reveal a genre effect: when participants are exposed to a story with a famous protagonist, this entity reaches a high level of prominence, overriding discourse constraints on reference resolution. This was evident in Exp.1 where the manipulation of discourse topicality had no effect on the referential preferences. In contrast, in the absence of a famous protagonist in Exp.2, discourse topicality influenced pronoun interpretation by decreasing NP2 references of the demonstrative and increasing NP2 references of the personal pronoun when NP2 was also the discourse topic. Furthermore, an analysis across experiments revealed a 3-way interaction of discourse topic, pronoun and experiment ($z=3.89$, $p<0.001$), supporting the influence of the protagonist in Exp.1. These findings indicate that discourse topicality competes with local factors of the immediately preceding antecedent, unless the wider discourse (genre-specific knowledge of famous protagonists) interferes with these structural constraints.

Experiment 1: Material (discourse topic in bold; pronoun underlined>. Original items were German)

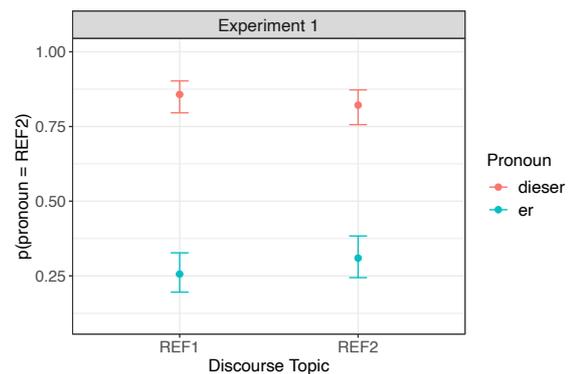
(1)/(2) Hastily, **the villain** ran along Baker Street. **He** was sure that **he** was being followed. Finally, **his** years of endurance training would pay off. But at the end of the street, **he** realized that **he** was being set up and would not win the chase. With shaky knees, **he** ran toward the end of the street, where **he** was already expected. [**The villain**]_{NP1} immediately went after [**Holmes**]_{NP2}. He/D-Pron had already drawn his weapon.

(3)/(4) Hastily, **Holmes** ran along Baker Street. **He** was sure that **he** was being followed. Finally, **his** years of endurance training would pay off. But at the end of the street, **he** realized that **he** was being set up and would not win the chase. With shaky knees, **he** ran toward the end of the street, where **he** was already expected. [**The villain**]_{NP1} immediately went after [**Holmes**]_{NP2}. He/D-Pron had already drawn his weapon.

Table 1: Results Exp 1

Example	Discourse topic	Pronoun	NP2 probability
(1)	NP1	Er	0.26
(3)	NP2	Er	0.31
(2)	NP1	Dieser	0.86
(4)	NP2	Dieser	0.82

Figure 1: NP2 probability, Exp 1



Experiment 2: Material (discourse topic in bold; pronoun underlined. Original items were German)

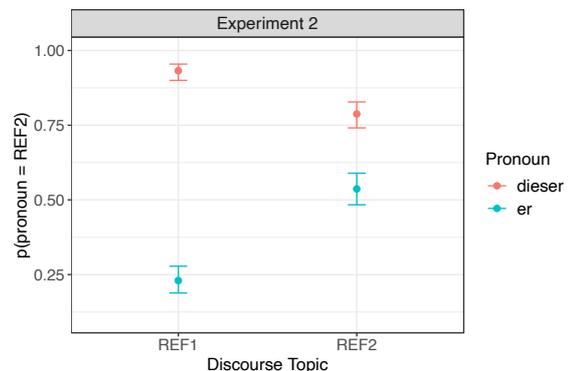
(5)/(6) Hastily, **the impostor** ran along the avenue. **He** was sure that **he** was being followed. Finally, **his** years of endurance training would pay off. But at the end of the street, **he** realized that **he** was being set up and would not win the chase. With shaky knees, **he** ran toward the end of the street, where **he** was already expected. [**The impostor**]_{NP1} immediately went after [**the policeman**]_{NP2}. He/D-Pron had already drawn his weapon.

(7)/(8) Hastily, **the policeman** ran along the avenue. **He** was sure that **he** was being followed. Finally, **his** years of endurance training would pay off. But at the end of the street, **he** realized that **he** was being set up and would not win the chase. With shaky knees, **he** ran toward the end of the street, where **he** was already expected. [**The impostor**]_{NP1} immediately went after [**the policeman**]_{NP2}. He/D-Pron had already drawn his weapon.

Table 2: Results Exp 2

Example	Discourse topic	Pronoun	NP2 probability
(5)	NP1	Er	0.23
(7)	NP2	Er	0.54
(6)	NP1	Dieser	0.93
(8)	NP2	Dieser	0.79

Figure 2: NP2 probability, Exp 2



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Evidence for a prosodic prominence budget in German utterances

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In this study, we investigate prosodic prominence relations of two succeeding discourse referents. Prosodic prominence of a discourse referent is modulated, among other factors, by its information status. Discourse-*given* referents are often produced less prominently, i.e., with less salient acoustic features, while discourse-*new* referents are more prominent. *Accessible* referents, which have not been explicitly mentioned but are predictable through the context, occupy an intermediate position on the prosodic prominence scale [1], [2]. Beside information status affecting the prominence of single referents, we argue that the syntagmatic relation between two referents in the same utterance (both in terms of meaning and prosodic form) is crucial in determining their prominence level.

To test this claim, we ran an online production task asking 32 native speakers of German to read aloud short stories in such a way that a fellow participant would be able to memorize them and sort corresponding picture cards into the correct order. The eight stories consisted of four sentences, the third of which was the test sentence. Each test sentence contained two target words as indirect and direct objects (see Figure 1 for an example). These were either *new* or *accessible* through the picture cards and the context provided in the second sentence.

The test sentences were annotated prosodically following DIMA [3]. Accent types on the target words were assigned a prominence score based on judgments collected by [4], which can be regarded as a perceptually motivated prominence hierarchy (see table).

Accent type	Perceived degree of prominence (mean percentages)
LH*	78.86
L*H	71.53
H*	69.64
H!H*	62.69
HL*	57.14
!H*	53.62
L*	43.97

We discuss preliminary results based on 24 speakers (192 utterances). In Figure 2, mean prominence scores are plotted by pitch accent position (*medial* or *final*) and information status of both referents. Evidently, the first target word is generally produced with more prominent accent types than the second one. This is likely to be a positional effect, since declarative German utterances often show a rising accent followed by a falling one in final position (cf. Figure 3). Overall prominence appears to be lowest in the *accessible-accessible* condition and highest in *new-new*. Syntagmatically, the largest decrease in prominence can be observed in the *new-accessible* condition, the smallest decrease in the *accessible-new* combination. This ranking is mirrored in word duration measures (Figure 4), where the difference between the target words is largest in the *new-accessible* and smallest in the *accessible-new* condition. An *accessible* referent following a *new* one is thus *relatively* least prominent while a *new* referent following an *accessible* one is most prominent, both in terms of duration and accent type. Furthermore, the durational differences between the referents in the ‘homogeneous’ conditions (*accessible-accessible* and *new-new*) are equal.

We regard this result as preliminary evidence for a (prosodic) *prominence budget* of an utterance that is determined by meaning-related cues such as the overall information status of discourse referents and which is distributed across these referents according to their semantic-pragmatic weight.



Figure 1: Example story in *accessible-new* condition

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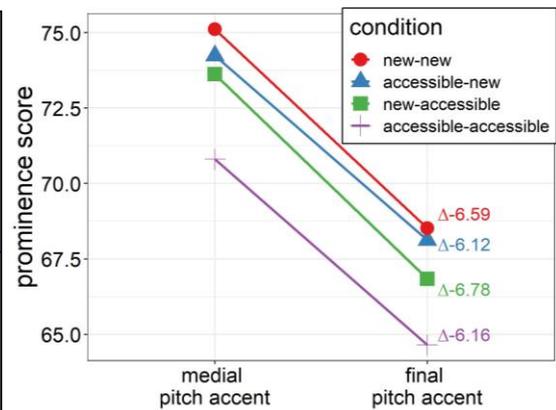


Figure 2: Mean prominence scores as a function of information status

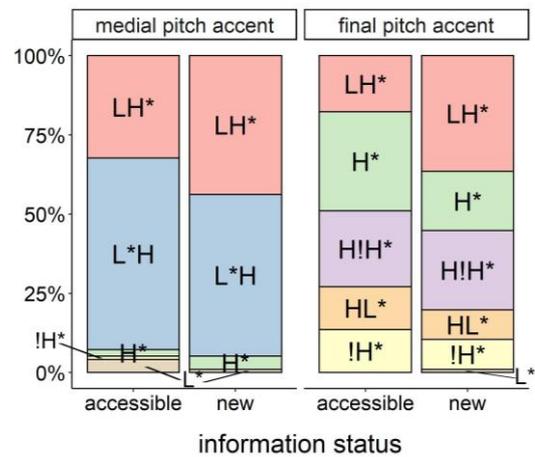


Figure 3: Medial and final pitch accent types as a function of information status

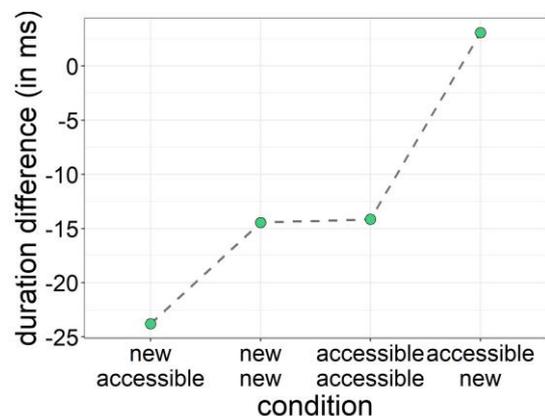


Figure 4: Mean differences in word duration (second target word – first target word)

The Role of Intonation in Attention Allocation in Serial Recall

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In speech processing, prosodic prominence is crucial for directing listeners' attention to the most important parts of the message. For instance, in West-Germanic languages important words typically bear a pitch accent (e.g. [1, 2, 3, 4, 5]). Some recognition memory tasks have shown that prosodically prominent words are recalled faster and more accurately than less prominent words [6]. Moreover, it has been found that recognition accuracy increases when words bear a rising L+H* accent rather than the shallower H* accent (for American English [7] and German [8]). The latter results are compatible with findings attesting that pitch accents with a large f₀ rise are perceived as the most prominent (in German [9]), and that intonational rises consume more attentional resources than falls (e.g. [10, 11]).

In languages with both pitch accents and boundary tones, it is generally assumed that pitch accents are the primary encoders of prominence [12, 13]. This suggests that rises on a pitch accent direct listeners' attention more than those at a boundary. However, a study on Italian involving serial recall of nine-digit sequences [14] has shown that rising boundaries at the end of non-final triplets enhance recall, especially on the last items in these triplets. This indicates that boundary tones may also cue prominence.

Here we investigate the effect of rising accents and rising boundary tones on attention in German, using a web-based serial recall task that requires participants to recall sequences of nine digits in the same order in which they are presented. We compared the effect on working memory of sequences grouped by marking the last item of the two non-final triplets with (i) a *rising-accent* + *high-boundary* (accent_RISE), (ii) a *low-accent* + *rising-boundary* (boundary_RISE), or (iii) a *falling-accent* + *low-boundary* (boundary_FALL), as compared to (iv) ungrouped sequences as controls (see Figure 1).

We performed generalised linear mixed-effects models (including prosodic CONDITION as the main fixed factor and assuming random intercepts and slopes for CONDITION by participants) and permutation tests on the recall data of 55 participants (26 female, mean age = 29.2 years, SD = 7.8). Results revealed that all grouped-by-intonation sequences led to better recall performance (i = 78.2 %, ii = 80 %, iii = 77.4 %) than controls (iv = 67.5 %), as a consequence of the grouping effect (likelihood ratio test: significant effect of CONDITION on accuracy, $\chi^2(3) = 55.177$, $p < 0.001$): Figures 2 and 3 show that digits in each position other than the first and last (due to primacy and recency effects) are recalled better in the grouped-by-intonation conditions. Pairwise comparisons confirmed that the three grouped-by-intonation conditions differ significantly from the ungrouped condition (with $p < 0.001$ each), but not from each other. Moreover, a permutation test confirmed that recall accuracy in the ungrouped condition (iv) is significantly ($p < 0.005$) worse for items in all positions except the first two in the sequences, and even in second position (iv) is significantly worse than boundary_RISE (ii) ($p < 0.005$). Results also indicate that intonational rises (i, ii) on non-final triplets led to better recall accuracy than falls (iii). Likelihood ratio tests on the accuracy on the *first and second triplet* registered a significant effect of CONDITION (triplet 1: $\chi^2(3) = 19.989$, $p < 0.001$; triplet 2: $\chi^2(3) = 60.885$, $p < 0.001$) and pairwise comparisons revealed significant differences between the three grouped-by-intonation conditions and the ungrouped condition in both non-final triplets (with $p < 0.001$ each, except for boundary_FALL in triplet 1 with $p < 0.05$), as well as between (ii) the boundary_RISE and (iii) the boundary_FALL conditions in triplet 2

($p < 0.05$). A likelihood ratio test on the accuracy on the *third position in the two non-final triplets* (positions 3 and 6) registered a significant effect of CONDITION ($\chi^2(3) = 50.74$, $p < 0.001$) and pairwise comparisons revealed significant differences between the three grouped-by-intonation conditions and the ungrouped condition (with $p < 0.001$ each), as well as between (i) the accent_RISE and (iii) the boundary_FALL conditions ($p < 0.05$) ((ii) vs. (iii): $p = 0.056$). Although there is no evidence for superior recall on digits bearing accent rises over those with boundary rises, boundary rises appear to facilitate recall over a larger domain, affecting recall of digits within the same triplet: Figure 4 shows improved performance over the whole medial triplet (positions 4, 5, 6) for (ii) the boundary_RISE condition, whereas improvements only occurred on the last item in the same triplet (position 6) for (i) the accent_RISE condition. Permutation tests confirmed a shift up in accuracy from (iii) boundary_FALL to (ii) boundary_RISE at positions 3, 4, 5, 6 ($p < 0.01$), from (iii) to (i) accent_RISE for positions 3 ($p < 0.05$) and 6 ($p < 0.01$), and from (i) accent_RISE to (ii) boundary_RISE at positions 4 ($p < 0.001$) and 5 ($p < 0.05$).

Hence, in general, our results provide evidence that intonational grouping improves recall ability, and that intonational rises lead to better recall performances than falls, indicating that they direct more attention towards an item or even adjacent items. If attention allocation and recall accuracy can be related to prominence, then accentual rises tend to have a local effect on the prominence of the digit, which is accented, whereas boundary rises appear to make the three-digit sequence of the triplet prominent, indicating a more distributed, or global, effect. The global effect of boundary H tones is unsurprising, as in autosegmental-metrical phonology it is analysed as a tone associated with the whole phrase (in this case the three-digit sequence), and could thus be facilitating recall of all items in that phrase, as opposed to an accentual H tone, that may have a more local effect, reflecting its association with a single digit. We have thus shown that intonation can serve to highlight a single item or multiple items within a list, leading to improved recall. We have also shown that the nature of the intonational tones (whether accentual or boundary tones) can determine the position and scope of these improvements.

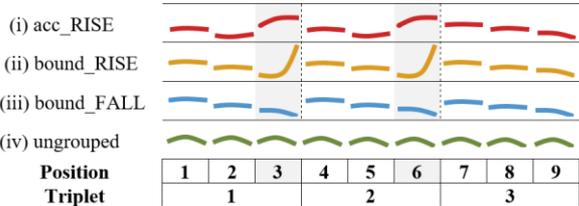


Figure 1. Schematized prosodic patterns of sequence stimuli for the four prosodic conditions. Vertical dashed lines mark intonational group boundaries. Digits in position 3 and 6 (end of first and second triplet) shaded.

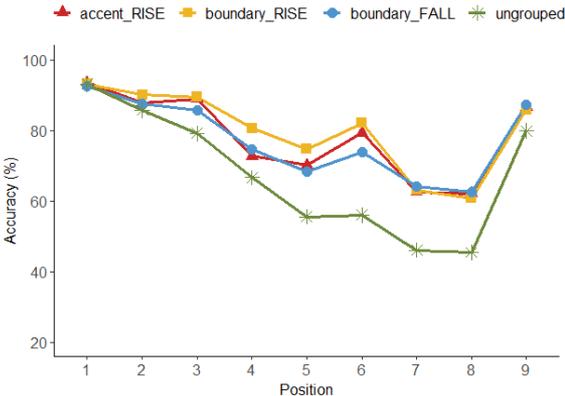


Figure 2. Serial recall curves by condition.

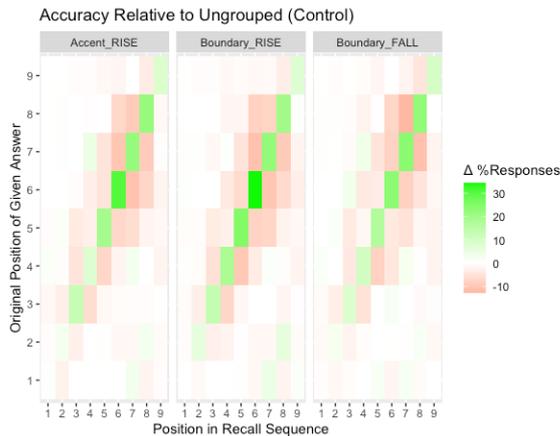


Figure 3. Accuracy of the grouped-by-intonation conditions relative to the ungrouped (control) condition: Position in recall sequence presented (x-axis) against position in recall sequence in responses (y-axis). Off-diagonal values indicate errors.

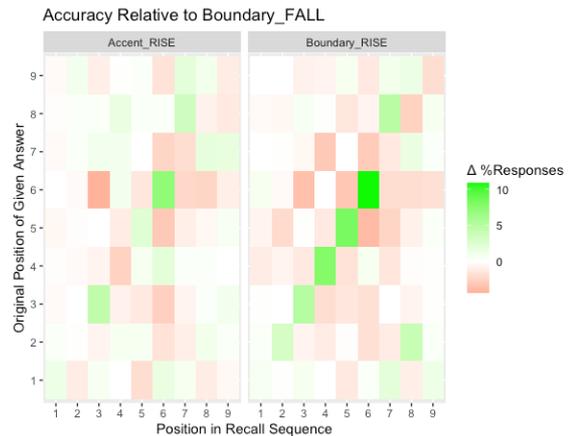


Figure 4. Accuracy of accent_RISE and boundary_RISE conditions relative to the boundary_FALL condition. In the accent_RISE condition improvements are more local (positions 3 and 6), whereas in the boundary_RISE condition improvements are distributed over multiple positions.

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Marking prominence in German Sign Language (DGS): A corpus analysis of object marking with the sign AUF

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Sign languages exploit the potential of the visual modality to associate referents with locations in space. This is seen in pointing signs and indicating verbs, as well as in forms that have been analyzed as auxiliary verbs to mark person and number when the verb itself cannot move through space. Recent research suggests a different analysis of these forms as an object marker for human objects of particular verb classes (Meir 2003 for Israeli Sign Language (ISL), Börstell 2017 for Swedish Sign Language (SSL) and Bross 2020 for German Sign Language (DGS)). For DGS, Bross (2020) proposes an analysis of this marker (glossed as AUF) as a Differential Object Marker (DOM) based on the affectedness of the object associated with the verb: obligatory occurrence with verbs with medium affected objects (e.g. *wait, know*; i.e. verbs in classes 3-5 in Tsunoda's 1985 hierarchy) and optional occurrence, depending on the definiteness of the object, with verbs high in affectedness (e.g. *hit, kill*; i.e. verbs in classes 1-2 in Tsunoda's 1985 hierarchy). We test these claims through an investigation of naturalistic corpus data (DGS public corpus, University of Hamburg, Konrad et al. 2020). We perform two analyses to better understand the effects of animacy (Analysis 1) and affectedness and definiteness (Analysis 2) on the use of AUF in DGS.

In the first analysis, we selected a subset of data from the corpus (signers from three distinct regions of Germany: Cologne, Stuttgart, Berlin) and identified all occurrences of AUF based on existing glosses of the corpus (N=135). For each occurrence, we coded the animacy of the object associated with AUF (animate human, animate non-human, inanimate). In the second analysis, we focussed on verbs with medium affected objects (*wait, search, proud, love, know, remember*). We identified all occurrences of these six verbs based on existing glosses of the corpus (N=294). We coded each predicate for occurrence with AUF (with AUF, without AUF), type of object expression (noun, pronoun, complement clause, present addressee, zero), animacy of object (animate human, animate non-human, inanimate), and definiteness of object (definite, indefinite).

Results from Analysis 1 confirm that the use of AUF strongly favors the occurrence with human objects (N=128; 95%), supporting previous findings. Interestingly, when AUF occurred with non-human objects (N=7; 5%), the contexts were such that the objects had agent-like qualities. For example, AUF occurred with "sports" in a context in which sports (i.e. the subject's outstanding athletic ability) is credited with paying for the subject's ability to travel around the world. In another example, the object is the name of a city and the city is described as getting upset about something. Based on the results of Analysis 1, in which the primacy of AUF with human objects was confirmed, we analyzed only verbs occurring with human objects in Analysis 2 (N=30; 10% of all verbs in our sample). We found that only a small proportion of these objects occurred with AUF (N=4). This contradicts the claim by Bross (2020) that AUF is obligatory with verbs with medium affected objects (i.e. verbs in Tsunoda's classes 3-5). In addition, definiteness may affect the use of AUF in these verbs, similarly to what Bross (2020) claims for high affected objects (i.e. verbs in Tsunoda's classes 1-2), where the optional use of AUF is related to definiteness effects: AUF as a

differential object marker that marks definite objects. For the medium affected verbs that we analyzed, we found that AUF never occurred with indefinite objects. However, we found definite objects occurring both with (N=4) and without (N=8) AUF, such that an explanation of the effects of definiteness on the use of AUF requires further investigation.

Though based on a limited data set (coding and analyses are ongoing), these preliminary results suggest that the object's animacy (specifically human animacy) is the main factor that influences the use of AUF to mark the object. This can be explained in terms of prominence, since when both the agent and patient are human, the competition between arguments to identify the most prominent argument is greater compared to when one of the arguments is non-human, e.g. inanimate. In these cases, AUF distinguishes the agent from the patient, pointing to prominence relations as a relevant factor determining the use of AUF. In the rare cases in which AUF was used to mark a place or other type of inanimate referent, the context attributes agentivity to these arguments, essentially anthropomorphizing them and attributing characteristics that only humans typically have - and thus providing strong support for the link between animacy and use of AUF, as proposed by Bross (2020). On the other hand, the second analysis suggests that there is no obligation to use AUF with verbs with medium affected objects (i.e. verbs like *wait*, *know*), as predicted by Bross (2020). We preliminarily propose that the use of AUF is related to definiteness effects in these verb classes as well, suggesting overall that definite animate objects are better candidates for receiving marking with AUF than indefinite animate objects. In our ongoing analysis, we pursue explanations based on prominence relations as a potentially important factor influencing the spatial marking of referents in space in a signed language.

Keywords: Differential object marking, sign languages, DGS, prominence

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The prominence of agents in event cognition and language processing: Reviewing the cross-linguistic evidence for a malleable preference

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Events are dynamic interactions unfolding over space and time. Events have rich internal organization, with a hierarchical scaffolding that is defined by the abstract roles agent and patient, as well as their relationship [1]. Both in language processing and in the processing of thematic relations in events, agents and patients differ in prominence: Agents can be detected rapidly [2], from early infancy on [3], and are looked at first in event pictures [4]. During sentence comprehension, role-ambiguous referents are preferentially interpreted as agents cross-linguistically [5–7], even when case marking patterns disfavor agent interpretations [8]. Based on cross-linguistic evidence from event cognition and language processing, we demonstrate that whereas agents are universally more prominent, their relative prominence can be modulated by linguistic experience.

In two eye-tracking studies, we measured visual attention to agents and patients in action pictures (e.g., a woman pushing a man) that were shown for only 300 ms. Such brief presentation requires top-down decisions for gaze allocation because it only allows for a single fixation [9]. In the first study on Dutch ($N = 41$) [10], participants uttered unrelated active or passive sentences before seeing pictures for a subsequent recognition task. Overall, participants more likely fixated agents than patients. However, Highlighting of patients in passives increased their prominence so that participants shifted their attention away from agents. Short-term linguistic experience (from a previously uttered sentence) can thus reduce agent prominence in event cognition. The second study contrasted Basque and Spanish. Basque assigns overt ergative case to agents, while Spanish leaves agents unmarked. Speakers of Basque ($N = 34$) and speakers of Spanish ($N = 36$) performed description and recognition tasks after brief exposure to event pictures. Agents were fixated more often and were described and recognized more accurately than patients. Basque speakers, in addition, gazed at agents more and described and recognized them more accurately than Spanish speakers. Basque speaker's long-term experience with ergative case thus led to an increase in agent prominence in both linguistic (description) and non-linguistic contexts (recognition).

Third, in an EEG study on sentence comprehension, we explored the influence of long-term linguistic experience on the agent preference in parsing [5–8,11]. In Äiwoo (Oceanic), patient-verb-agent sentences are grammatically unmarked and generally more frequent, although agent-verb-patient orders also occur [12,13]. Since there are no case

markers, the initial noun's role is only revealed by voice marking on the verb. When listening to initially ambiguous sentences, Äiwoo speakers ($N = 22$) preferentially interpreted non-humans as patients, but humans as agents (evidenced by N400 effects). This finding demonstrates that agent prominence is robust for humans, but can be modulated by broad-scale patterns of language use for other referents.

We conclude that the prominence of agents over patients is a stable feature of cognition, occurring across domains in event cognition and language processing. The relative agent-patient prominence relation can be altered, but not generally reversed. This suggests that the agent preference as a fundamental principle of human cognition, which is shaped by experience-based learning.

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Don't make me more prominent! Or do? Prosodic reflexes of contrast, newness and givenness in *wh*-exclamatives and *wh*-questions

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Prosodic prominence is known to correlate with information-structural categories. In assertions, givenness is associated with low prosodic prominence (deaccentuation, less prominent accent types, shorter duration ([1, 2]), contrast correlates with increased prominence (more prominent accent types, longer duration ([3, 4]), and new information is intermediate on the prominence scale between given and contrastive information. Three-way comparisons, however, where potential additive or subtractive effects of the categories are investigated, are rare, and contrast is usually conflated with correction. In speech acts other than assertions, the seemingly basic correlation of givenness with low prominence may break down to a considerable extent: in exclamations, givenness is not marked by deaccentuation or less prominent accents [5, 6]. (Non-corrective) contrast, however, still seems to correlate with high prominence in some exclamations, which may result in (additional) prominence reduction for non-contrastive information in the clause [6]. Again, there are no three-way comparisons. The lack of deaccentuation in exclamations has been argued to arise from a prosodic constructional default requiring (very) high prominence on at least one exponent in the clause for speech act marking [7]. (Non-corrective) contrast marking can 'piggy-back' on this requirement and even increase high prominence, whereas givenness marking is suppressed.

In this study, we investigate the prosodic prominence of given, new and contrastive information in a fully crossed 3x2 design in two non-assertive speech acts, and explore the exact contribution to prosodic prominence of newness (narrow non-contrastive information focus) and non-corrective contrast (explicit focus alternative in the context) in speech acts having different illocutionary requirements regarding prominence: *wh*-exclamatives and *wh*-questions. We present data from a production experiment in German exploring potentially additive prominence marking of the two prominence-lending information-structural categories (newness, contrast) in relation to the requirements of the speech acts. (1) shows an example paradigm for questions; in exclamations the speaker did not ask but expressed amazement. The underlined antecedents in the context (contrastive alternative, given referent, superset of referents) were identical in both speech acts.

Highlighting some of the findings (Figure 1): Exclamations overall had more accents on the object and on the subject *d*-pronoun than questions, regardless of information structure. The object was accented in 89% of exclamations even when it was given and non-contrastive. The *d*-pronoun (always given and non-contrastive) was accented in >90% of exclamations in every condition. Contrast and newness had additive effects on the object in both speech acts but in the pairwise comparisons, the effects were significant only for questions. The object's main competitor for accent placement in questions was the lexical verb, showing a complementary accentuation pattern. Phonetically, the object only showed significant differences for newness: it was longer if new. None of the pitch-related measures showed differences for contrast or newness within identical accent types.

The study corroborates the previous finding for a reduced sensitivity to information structure in exclamations vs. questions: given material is quite resistant to deaccentuation in

exclamations. Surprisingly, the effects of contrast are also rather minimal in *wh*-exclamatives. The additive effects of contrast and newness especially in questions suggest that the two categories are independent of one another.

(1) Sample item: a question in all information-structural conditions

A: Have you heard? Anna has specialized in {-C *Given*: Germanic tribes / -C *New*: old European tribes / +C *Given* Etruscans / +C *New*: old European tribes} for her dissertation now.

B: [*Non-contrastive context*] Really? Then she's probably traveling a lot in order to obtain original sources from {*Given*: Germanic tribes / *New*: old European tribes}. Do you happen to know...

B: [*Contrastive context*] Yes, she is always on research trips. Just recently she was in Italy because of a necropolis of the Etruscans. But I think she is {*Given*: also traveling a lot because of her much-loved Germanic tribes. / *New*: traveling a lot not only because of Etruscans.} Do you happen to have heard...

... wo die schon überall Germanen erforscht hat?
 where she already everywhere Germanic tribes researched has
 'where she has already researched Germanic tribes?'

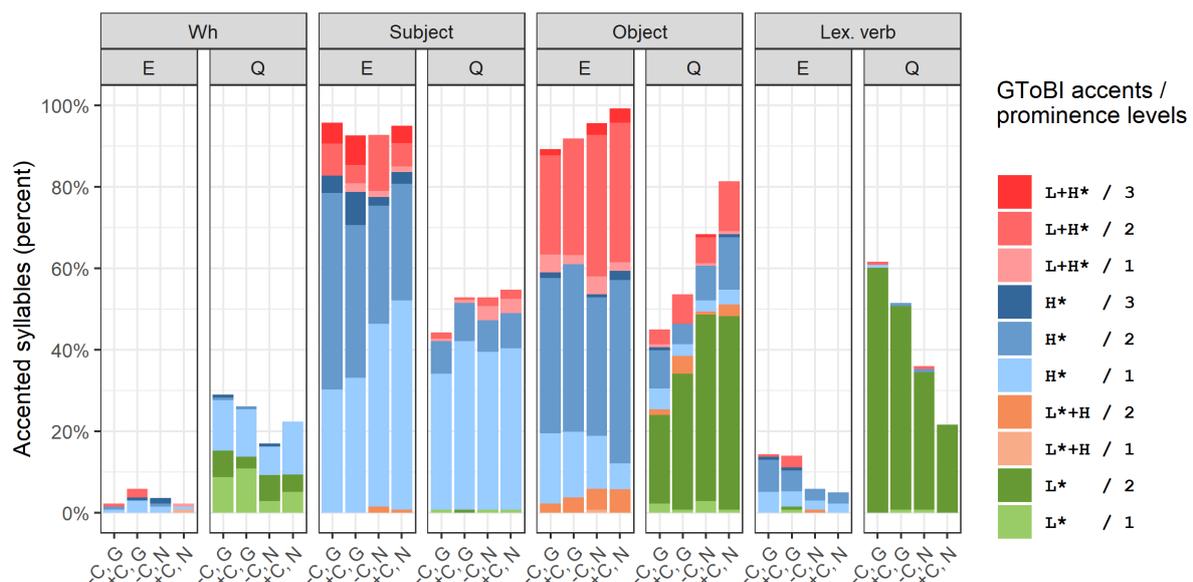


Figure 1. Accentuation per syllable across utterances. Abbreviations on the x-axis refer to the information-structural status of the object: C = Contrast, G = Given, N = New.

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Corrective focus and tone sandhi in Xiangshan Wu Chinese

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Xiangshan Wu Chinese, a dialect spoken in the southeastern part of China, exhibits two sandhi patterns which prevail in the Northern Wu dialect groups in China: (a) Left-dominant: a left-to-right tone spreading mode that usually only applies to lexical compounds and modifier-head phrases; (b) Right-dominant: a mode that preserves the last tone and reduces some tonal features of preceding tones, and is usually only found in verb-headed phrases. Some previous studies analyse this asymmetry as a one in edge prominence (e.g. Selkirk & Shen 1990). Examples in (1) demonstrate the underlying mechanisms of the two sandhi patterns.

(1) Left-dominant			Right-dominant
[lao	lu]		[ma vε]
'old road'			'buy rice'
LML	LM	underlying tones	LML LM underlying tones
LML		deletion	L LM reduction
L	M	spreading	

The present study examines how corrective focus affects tone sandhi patterns in disyllables in Xiangshan Wu Chinese. Participants include 8 Xiangshan native speakers (mean age: 50, 4 female). A total of 48 disyllables are selected as target tokens, which cover 8 tone combinations and 3 morpho-syntactic structures: (a) Lexical compounds; (b) Modifier+Head (MH) phrases; and (c) Verb-Object (VO) phrases. Presented with the target token in written text and a recording containing a disyllable that differs from the target in one syllable, the participants were prompted to correct the mismatching syllable, thus producing the disyllables with a corrective focus.

Results reveal that the presence of corrective focus, though not always, does affect the sandhi outputs. Three strategies have been observed: (a) Prosodic boundary insertion: each monosyllable forms its own domain and thus preserves the underlying tone; (b) Substitution with a falling contour: the focused tone changes to a falling contour; (c) Prominence head swapping: the head swaps to the other syllable and the whole disyllable thus adopts an opposite sandhi pattern. In (2) I use the disyllable [lao lu] 'old road', which originally adopts left-dominant pattern and has the focus on the 2nd syllable, to illustrate the three strategies.

(2) Strategies for marking focus		
[lao	lu]	
'old road'		
(LML)	(LM)	underlying tones
(L	M)	citation sandhi
(LML)	(LM*)	a. Prosodic boundary insertion
(L	HL*)	b. Substitution with a falling contour
(L	LM*)	b. Prominence head swapping

Interestingly, while strategies (a) and (b) are equally frequently adopted in disyllables originally using left- or right-dominant patterns, strategy (c) is largely detected in left-dominant patterns. It can possibly be explained by the higher complexity of left-dominant

pattern, which is thus not preferred; or by another more theoretical account which assumes that right-dominant pattern happens at the phrasal level whereas left-dominant pattern happens at a lower level and the application is not reversible from a higher to a lower level.

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Discourse prominence relations as an explanation for reconstruction under ellipsis

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Synopsis. From 2001 onwards, the prevailing view of ellipsis in mainstream generative grammar has been the *move & delete approach* (MDA) exemplified in (1):

- (1) (Speaker) A: Would John hire a man?
(Speaker) B: No, [a woman]_i, Foc [~~deletion John would hire t_i~~]

The MDA claims that elliptical fragments must move from a deletion domain, because ellipsis *unselectively* elides that domain.^[1,2] However, the MDA has serious conceptual and empirical shortcomings, particularly as a theory of clausal ellipsis.^[1-6] In this paper, we will offer an explanation for clausal ellipsis that uses discourse factors to predict ellipsis options: Ellipsis fragments, it is shown, can originate from any and all propositions which are prominent enough in a discourse to be *reconstructable*, a term we define below. For this aspect of ellipsis, no syntactic explanations are needed, we argue.

Phenomena and previous approaches. In clausal ellipsis, hearers must often reconstruct materials that are not pronounced. In our examples, we mark *interpreted, but unpronounced* materials by strikethrough. Consider the rejection expressed by C in example (2):

- (2) A: Who did John see at the party?
B: ~~John saw Tom at the party.~~
C: That's not true!

If it was not for the indicated interpretation, B would in fact not even have supplied a proposition that C could regard as *untrue* in the first place.

According to the MDA, materials that figure as elliptical fragments are focussed, since only foci (marked *Foc*) are extracted from the deletion domain in (1). Materials that cannot move fail to serve as fragments, the MDA claims – for example, material from inside the relative clause (RC) island in (3):

- (3) A: Would John hire a man who tries to repair cars with a hammer?
B: *No, [a screw driver]_i, Foc [~~John would hire a man~~ [_{RC} ~~who tries to fix cars with t_i~~]]

Various problems have been pointed out for the MDA.^[4-7] To cite but one example here, German modal particles can surface in fragments, despite being categorically immobile and unfocussed by definition (4):

- (4) A: Wen hat John auf der Party gesehen?
who has John at the party seen
'Who did John see at the party?'
B: ~~Peter hat Tom wohl auf der Party gesehen.~~
'Tom, probably.'
*cf.: *Tom wohl (hat Peter auf der Party gesehen).*

Proposal. We provide evidence that materials are available as ellipsis fragments iff the propositions they are contained in are *reconstructable* – i.e., *discourse-prominent enough* to

serve as coherent at-issue answers, given the previous discourse. We show that the notion of this kind of discourse prominence is largely based on the notion of *question under discussion*^[12, 13]. Continuative relative clauses, e.g., make assertion-level contributions to the discourse (proffer a proposition for inclusion in the common ground), and therefore can be picked up by contrastive fragments (5):

- (5) A: John told the news to Tom in the morning, who promptly passed it on to Mary later.
 B: No, ~~Tom passed the news on~~ to Susy.

However, additional factors relating to both semantics and world knowledge seem to enter the equation as well, we show: Restrictive relative clauses' propositions, e.g., also allow for fragment formation under such additional (often, non-discursive) conditions, we show (6).

- (6) A: In the GDR, they had cars made from carbon.
 B: No, ~~they had cars made from~~ cardboard.
 B':#No, ~~they had~~ cardboard in the GDR.

Furthermore, focus particles can associate with foci inside syntactic islands – and propositions contained inside the islands still reconstruct, contra the MDA (7):

- (7) A: Maria küsst wirklich *nur* Leute, die *niemand*_{Foc} hübsch finden kann.
Maria kisses really only people who nobody pretty find can
 'Mary really only kisses people nobody could consider pretty.'
- B: Oder ~~die~~ nur deren eigene Mutter hübsch finden kann.
or only their own mother
 'Or people_i who are only considered pretty by their_i own mothers.'
Note unavailable reading: 'Mary only kisses those people's mother(s).'

Our explanation for such data is as follows: In the MDA paradigm examples, relative clauses were used which contained *non-at issue propositions*. Since rejections target at-issue propositions, the failure to provide contrasts to *non-at issue* materials followed. On the other hand, propositions from relative clauses *become* reconstructable in the contexts given, as well as many others we also present in our talk (e.g., when main clauses are tautological, contradictory, or too clearly given to be questioned). Barring new evidence to the contrary, we assume that syntactic factors play no role for the question of ellipsis and reconstructability.

The talk also discusses further issues surrounding ellipsis, which *prima facie* seem to confound the discourse-oriented reconstruction logic advocated for here: E.g., fragment (*sic!*) materials must be licensed by forms uttered verbatim in the discourse^[8]. However, such verbatim materials are quickly forgotten.^[9] Therefore, performance conditions explain the 'locality' of elliptical anaphoricity, we claim. Furthermore, languages can differ with regard to the sentence types that are useable (and used) for making at-issue contributions to a discourse.^[10-11] We claim that these typological differences follow from grammaticization of use patterns, whereby the discourse facts that are responsible for ellipsis, are also responsible for constraining syntactic extraction, potentially explaining the (limited, cf. above) correlations with ellipsis options. Note, however, that these discussions do *not* relate to *ellipsis*, or the reconstruction of elided materials. Ellipsis, and elliptical reconstructions, can still be explained in non-syntactic terms – even if fragment materials certainly cannot.

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Experimental evidence from Ibero-Romance for fine-grained distinctions on prominence scales

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Prominence scales (Silverstein 1976, Haspelmath 2021) are frequently invoked in the context of differential object marking (DOM) to account for the splits and the variation observed in grammars. Over time, the scales have become ever more fine-grained, as for instance the revised version of the so-called extended animacy hierarchy in (1) proposed by Caro Reina (2020: 250), where four different kinds of names have been added.

(1) first/second-person pronoun > third-person pronoun > deity name > personal/kinship name > animal name > place name > human common noun > non-human animate common noun > inanimate common noun

While such scales have been established mainly with evidence from cross-linguistic comparison, sometimes corroborated with quantitative corpus data from individual languages, they are less well-understood from a psycholinguistic perspective. For instance, it is unclear whether (all) the fine-grained distinctions are made by speakers of some particular language and how the cognitive distinctions that are available map on the language-particular categories used by speakers. We use gradient acceptability judgment tasks (AJTs) to investigate these questions.

This work reports the results from four comparably designed AJTs on Spanish, Catalan, European Portuguese (EP) and Brazilian Portuguese (BP). The experiments test (i) the proposal in Caro Reina (2020) to introduce the *identifiability* feature on the scale in (1) to distinguish the category of deity names from personal proper names for Portuguese; (ii) the intuition by Cyrino (2017) that DOM, although hardly ever used by speakers, is optionally available in Brazilian Portuguese; and (iii) a proposal based on own previous work on Spanish to further divide the inanimate category for abstract nouns, depending on the availability of human or animate referents in the cognitive frame of the noun.

In the experiments, we used a 3X2 factorial design, crossing the presence and absence of the differential marker with three degrees from the scale (number of participants in parentheses):

Experiment 1 and 2: human > animate > inanimate (Spanish (42), Catalan (240))

Experiment 3: deity name > person name > inanimate noun (EP (44), BP (44))

Experiment 4: collectives of animates > institutions > other abstract nouns (Spanish (210))

In each AJT, 60 written sentences (50% distractors) were rated individually on a 7-point Likert scale. An example item from each experiment can be found in the table below. Results show effects for the three-way animacy distinction in Experiment 1 and 2, which is categorical in the Spanish data but shows optionality in some conditions in Catalan. We also found partial confirming evidence for the proposal regarding EP in Caro Reina (2020) and the claim regarding BP in Cyrino (2017) in Experiment 3. Finally, the results from Experiment 4 support the idea that inanimate abstract common nouns are also sensitive to the animacy hierarchy: animacy is more prominent on nouns denoting collective sets of animates than on nouns denoting institutions which do not denote sets of humans but rather are created and only may

be instantiated by them. Still, animacy is more prominent in their cognitive frame than in those of other abstract nouns.

Example items

S NP [+anim]	Trans. V	DOM	DO NP	AdvP
La muchacha <i>the girl</i>	ha encontrado <i>found</i>	a / Ø DOM/-	la amiga <i>the friend</i>	en el patio de la escuela. <i>in the schoolyard</i>
La muchacha	ha encontrado	a / Ø	la gata <i>the cat</i>	en el patio de la escuela.
La muchacha	ha encontrado	a / Ø	la pelota <i>the ball</i>	en el patio de la escuela.

Example experiment 1 (Spanish)

El director <i>the director</i>	va filmar <i>filmed</i>	a / Ø DOM/-	la meva nora <i>my daughter in law</i>	per al documental sobre la vila. <i>for the documentary about the village</i>
El director	va filmar	a / Ø	la meva mula <i>my mule</i>	per al documental sobre la vila.
El director	va filmar	a / Ø	la meva granja <i>my farm</i>	per al documental sobre la vila.

Example experiment 2 (Catalan)

Os legionários <i>The legionnaires</i>	honraram <i>honoured</i>	a / Ø DOM/-	Marte. <i>Mars</i>
Os legionários	honraram	a / Ø	Eduardo.
Os legionários	honraram	a / Ø	anfiteatro. <i>amphitheater</i>

Example experiment 3 (Portuguese)

El jubilado <i>the retiree</i>	denunció <i>exposed</i>	a / Ø DOM/-	la familia <i>the family</i>	en la entrevista de televisión. <i>in the interview on TV</i>
El jubilado	denunció	a / Ø	el gobierno <i>the government</i>	en la entrevista de televisión.
El jubilado	denunció	a / Ø	el programa <i>the program</i>	en la entrevista de televisión.

Example experiment 4 (Spanish)

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