

DISENTANGLING LINEARITY: CROATIAN PERSONAL PRONOUNS

Anita Peti-Stantić & Mirjana Tonković, University of Zagreb
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AN OUTLINE OF THE TALK



- + 1. CROATIAN SCIENCE FOUNDATION PROJECT MEGAHR/MEGACRO
- + 2. THEORETICAL POSTULATES: INFORMATION STRUCTURE AND PARALLEL ARCHITECTURE
- + 3. DATA: CLITIC CHOICE
- + 3. ANALYSIS: CHOICE AS AN INFORMATION
- + 5. CONCLUSIONS

GOALS OF THE TALK



- + 1. to give an additional insight into the constraints on information structure and its role in the sentence organization
- + 2. to underline the need of incorporating conceptual, phonological and syntactic modules in an analysis
- + 3. to present the first approximation distributional constraints of long and short pronominal forms in Croatian (backed up with experimental results)
- + **MAIN RESEARCH QUESTION: what are constraints on the insertion of long and short pronouns**
 - + syntax
 - + prosody
 - + conceptual/information structure/sentential semantics

THE BUILDING BLOCKS OF MENTAL GRAMMAR IN CROATIAN: CONSTRAINTS OF INFORMATION STRUCTURE

- + based on corpus and psycholinguistic research methodology
- + AIM: to determine a set of necessary, universal and language-specific constraints representing the requirements that govern the information structure in Croatian, both on the morphosyntactic and the semantic level
- + **predominantly interested in local (linear) and global (hierarchical) processing constraints within the mental grammar of Croatian**
- + 4 years (started March 10, 2017)₃



MEGAHR/MEGACRO



+ PRACTICAL GOALS:

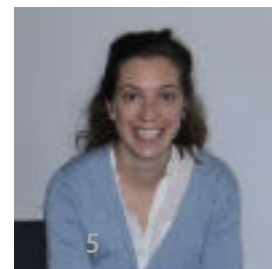
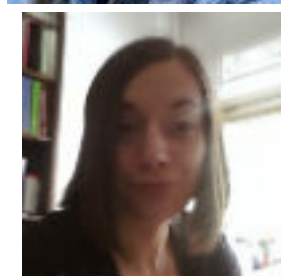
- + (1) correlation between **concreteness and imageability** for a set of high and low frequency lexical items (3000 words) and grammatical items (constructions, full forms and clitics)
- + (2) relationship between **concreteness and agreement** (in gender, ellipsis and clitic cluster positioning)
- + (3) language specific **constraints/patterns for building effective word and grammar webs** within the educational system

+ THEORETICAL GOALS:

- + (1) enhancing existing models of language computational modeling
- + (2) establishing connections between global and local building blocks of mental grammar of Croatian

COLLABORATORS AND EXPERTS

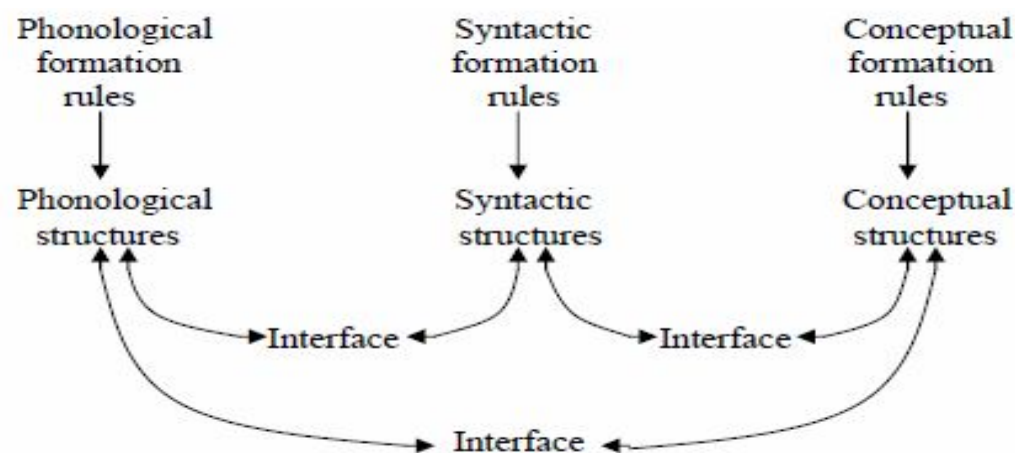
linguistics, psycholinguistics, developmental psychology, natural language processing, computational modeling, neurolinguistic modeling



RCAB Dubrovnik, October 20, 2017

INFORMATION STRUCTURE AND PARALLEL ARCHITECTURE

- + IS is NOT just pragmatics
- + IS is meeting point of the phonological, syntactic and semantic representations
- + the conceptual structure of the sentence depends on **the interaction between interface constraints**





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THE BUILDING BLOCKS OF MENTAL GRAMMAR IN CROATIAN:
CONSTRAINTS OF INFORMATION STRUCTURE

PRONOUNS IN CROATIAN

- + so called long or full and short or (en)clitic forms
- + GEN *mene/me, tebe/te, njega/ga* etc.
- + DAT *meni/mi, tebi/ti, njemu/mu* etc.
- + ACC *mene/me, tebe/te, njega/ga* etc.
- + long and short forms occur in the same syntactic positions within the clause
- + (en)clitics are prosodically deficient, need a prosodic host to the left of them

PRONOUNS IN CROATIAN

ESTABLISHED KNOWLEDGE



INTERFACE PIECES OF STRUCTURE

mene me

- morphosyntactically unrestricted

mene

- unrestricted in phrasal phonology and almost unrestricted in WO

me

- restricted in phrasal phonology and WO

PRONOUNS IN CROATIAN

HOW TO SPEAK ABOUT SEMANTICS/CONCEPTUAL STRUCTURE?

- + **ASSUMPTION:** the correspondence of clitics and full forms is one-to-one only in syntax and one-to-many on all other representational levels
- + short forms – restricted in sentence prosodic structure and WO
- + long forms – restricted in the conceptual/information structure/sentential semantics



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THE BUILDING BLOCKS OF MENTAL GRAMMAR IN CROATIAN:
CONSTRAINTS OF INFORMATION STRUCTURE

INFORMATION STRUCTURE IN PA

- + basic assumption of PA – lexemes – interface pieces of structure (triplets of phonological, syntactic and semantic information)
 - + lexically specified information plays a critical and early role in processing/the interpretation of grammatical structure
- + long and short forms are already predefined in the mental lexicon
 - + choice depends on the information needed to be communicated
- + Ray Jackendoff (1972) *Semantic interpretation in generative grammar* Focus assignment, first approximation
 - + Focus of the sentence: surface structure nodes dominated by F feature
- + **BUT...**





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INFORMATION STRUCTURE IN PA

- + Ray Jackendoff (2002) *Foundations of Language: Brain, Meaning, Grammar, Evolution*
- + “What sort of a grammatical entity is focus? Many writers (including Jackendoff 1972) have identified focus in terms of a feature [+F] or the like marked in syntax, but this misses the point. First of all, one still must account for the semantics/pragmatics of focus. A syntactic feature can at best correspond to or express this semantic/pragmatic property of the sentence, which properly belongs in conceptual structure.”
- + “Hence a simple feature (or node) really does not do much work in syntax – one needs in addition complex ways to work out the actual realization of this feature in each language.”

HYPOTHESIS



- + some words/constructions/structures have inherent focusing effects (see also Cardinaletti and Starke 1994, 1999 on referential asymmetry)
- + **HYPOTHESIS 1:** The choice of full form elicits immediate focusing effect (contrastive interpretation) while the choice of short form leaves the room for other sentential elements to be focused.



METHODS



- + grammaticality judgment tests of sentences containing paired clitic and full case forms
 - + pen and paper psycholinguistic test followed by computer based E-Prime reaction-time sensitive experiment
- + the test was motivated by a broader understanding of an agreement as the choice between possible, yet **potential grammatical properties** (Corbett 2003)
- + our aim with these tests was to establish the setting for **differential gradient mapping dependent on information structure** between so called **full forms**, usually seen as *regular lexical items*, and **clitics**, *highly grammaticalized forms*

METHODS, MATERIALS AND PARTICIPANTS

- + TASK: to judge the grammaticality of sentences by thinking of their semantic structure on a scale from 1 to 5 (65 participants, University of Zagreb students)
- + 6 different types of sentences (no context, compatible context and incompatible context, both long and clitic forms (96 sentences)
- + all three persons, Dative and Accusative forms
 - + person and case as variables were not significant

NO CONTEXT	COMP. CONTEXT	INCOMP. CONTEXT
<i>Brat me posjećuje.</i>	<i>Brat me redovito posjećuje, a sestra skoro nikada.</i>	<i>Brat me redovito posjećuje, a ne sestru.</i>
<i>Brat mene posjećuje.</i>	<i>Brat mene redovito posjećuje, a ne sestru.</i>	<i>Brat mene redovito posjećuje, a sestra skoro nikada.</i>

MATERIALS: NO CONTEXT

- + Brat **me** redovito posjećuje.
 - + 'Brother regularly visits me.'
- + Brat **mene** redovito posjećuje.
 - + 'Brother regularly visits me.' or
 - + 'Brother regularly visits ME.'
- + MAIN RESEARCH QUESTION: Is it valid to claim that **the long pronominal forms by its insertion in a sentence always trigger contrastive focus reading?**

MATERIALS: COMPATIBLE CONTEXT



- + **Brat** me redovito posjećuje, a **sestra** skoro nikada.
 - + 'BROTHER regularly visits me, and the SISTER almost never (visits me).'
- + Brat **mene** redovito posjećuje, a **sestru** skoro nikada.
 - + 'Brother regularly visits ME, and (he) almost never (visits) the SISTER.'
- + First example – contrastive focus between the whole first clause (brat me redovito posjećuje) and the second clause (a sestra skoro nikada)
 - + Emphasis on the focused Agent 'brat' (if there is no other focus in the clause triggered by the WO, focused by the IP) in the first and Agent 'sestra' in the second clause
- + Second example – contrastive focus between the Patient in the first clause 'mene' (triggered by its insertion) and the Patient 'sestru' in the second clause
 - + Insertion of a long pronominal form in the second example overrides the possibility of less prominent Agent 'brat' to be focused

MATERIALS: INCOMPATIBLE CONTEXT



- + **Brat** me redovito posjećuje, a **sestru** skoro nikada.
 - + 'BROTHER regularly visits me, and he almost never visits SISTER.'
- + Brat **mene** redovito posjećuje, a **sestra** skoro nikada.
 - + 'Brother regularly visits ME, and SISTER almost never (visits me).'
- + First example – **conflict** between focused Agent 'brat' in the first clause (because no other potential for focus) and Patient 'sestra' in the second clause
- + Second example – **conflict** between focused Patient 'mene' in the first clause (triggered by insertion) and the Agent 'sestra' in the second clause

CONTEXTUALIZED SITUATIONS

+ ACTUAL CONFLICT IN FOCUSING AGENT AND PATIENT RELATION

+ *Brat* me redovito posjećuje, a *sestra* (me) skoro nikada (ne posjećuje).

+ vs **Brat me* redovito posjećuje, a (brat) *sestru* skoro nikada (ne posjećuje).

and

+ **Brat mene* redovito posjećuje, a *sestra* (mene) skoro nikada (ne posjećuje).

+ vs Brat *mene* redovito posjećuje, a (brat) *sestru* skoro nikada (ne posjećuje).

HYPOTHESIS AND EXPECTATIONS

- + **HYPOTHESIS 2: THERE IS A HIERARCHY OF FOCUSING in Croatian. Insertion of a focus-bearing form suppresses all other potential foci.**
- + EXPECTATION
 - + gradient path towards acceptability
- + WHY?
 - + because focus is dependent on the communicative needs that we build gradually, taking into account the complexity of an utterance

RESULTS AND DISCUSSION

pen-and-paper (main effect of the context)



- + results analyzed with two-way analysis of variance
 - + 2 independent variables: context and pronominal form
 - + dependent variable was grammaticality judgment of a sentence

+ **ANALYSIS: statistically significant effect of the context ($F(2/128) = 29,6$; $p < 0,01$)**

incompatible context	no context	compatible context
least grammatical ($M=3,43$)	($M=3,88$)	($M=3,91$)

RESULTS AND DISCUSSION

pen-and-paper (main effect of the form)

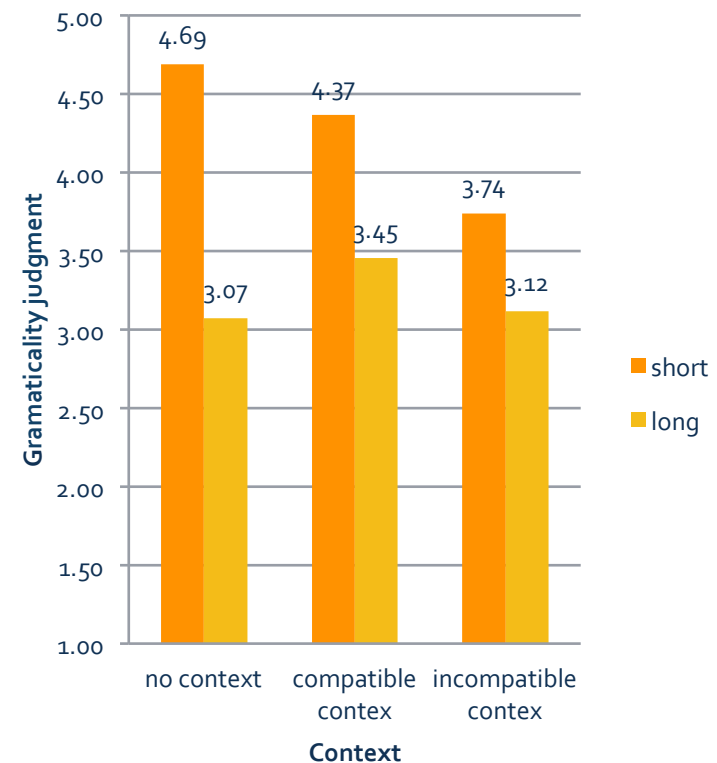


- + also, statistically significant effect of the pronominal form
($F(1/64) = 181,732$; $p < 0,01$)
 - + SHORT FORM (M=4,27)
 - + LONG FORM (M=3,21)
- + INTERESTING CORRELATION
 - + corpus search shows significant prevalence of using short forms over long ones (because there are many more situations where short form is needed)
- + this leads to our next point...

RESULTS AND DISCUSSION

pen-and-paper (interaction)

- + significant interaction between the context and the P form ($F(2/128) = 60,21$; $p < 0,01$)
 - + no context – the biggest difference between short and long form
 - + gradually lesser difference between short and long in compatible and incompatible context
- + SHORT FORMS
 - + no-context > compatible context > incompatible context
- + LONG FORMS
 - + compatible context > no-context and incompatible context



RESULTS AND DISCUSSION

E-prime

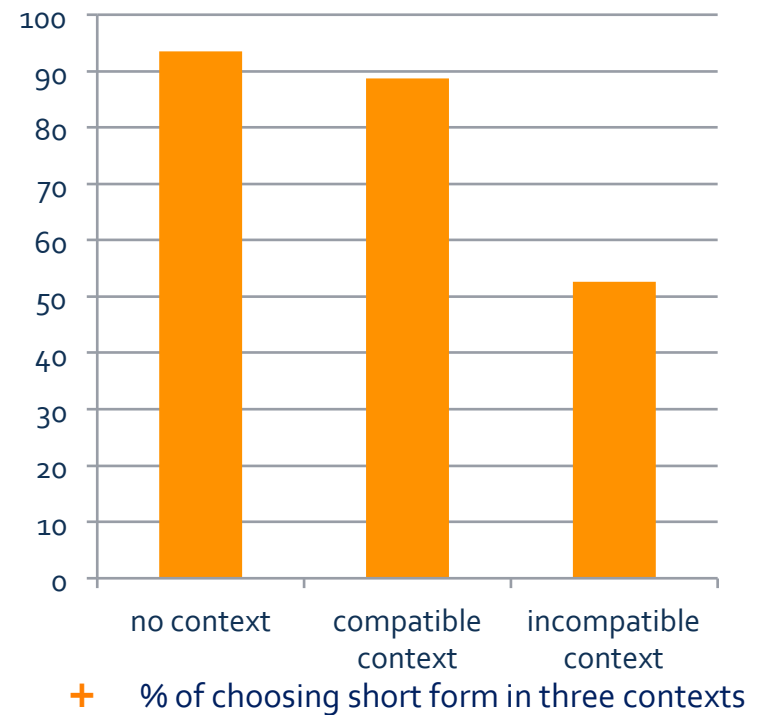


- + participants were asked to decide which pronominal form is more appropriate in the given sentence
- + same sentences (N=48 sentences)
- + we recorded how many times long or short pronominal form was chosen in three situations:
 - + in no context situations
 - + in situation where context points to the short pronominal form
 - + and
 - + in the contexts asking for the long pronominal form
- + 16 different examples for each situation
- + we also measured the decision reaction time (RT)

RESULTS AND DISCUSSION

E-prime

- + short pronominal form in no context situations $M=14,97$ ($SD=1,414$) times (out of 16 possible)
- + context pointing to the short pronominal form, short forms were chosen $M=14,2$ with a $SD=2,223$
- + context pointing to the long pronominal form, short forms were chosen $M=8,43$ with a $SD=4,937$
- + results in line with pen-and-paper results, where short forms were rated higher in no context situation than in compatible context situation



DISCUSSION AND CONCLUSION

CHOICE AS AN INFORMATION



- + **Pen-and-paper results** clearly show that the natural information frame for the short pronominal forms is **no context situation**, with gradient linear cline into incompatible context: **no context > compatible context > incompatible context**.
 - + Brat me redovito posjeđuje. > Brat me redovito posjeđuje, a sestra ne. > Brat me redovito posjeđuje, a sestru ne.
- + For the long pronominal forms, the **only compatible contrastive focusing context** shows peak in results.
 - + Brat mene redovito posjeđuje, a sestru ne. > Brat mene redovito posjeđuje. = Brat mene redovito posjeđuje, a sestra ne.

DISCUSSION AND CONCLUSION

CHOICE AS AN INFORMATION



- + **E-prime results** clearly show the prevalence of choosing short pronominal forms in no context situations over insignificant number of long forms in the same situation.
- + in contrastive contexts, both forms are used (long and short), but NOT INTERCHANGEABLY
 - + in contexts asking for short form, short form was chosen
 - + in contexts asking for long forms, both long and short forms were chosen (50%)
 - + Frequency effect ?
 - + Neutrality effect ?
- + **CONCLUSION: In neutral contexts in Croatian, short pronominal form is the default form. Long form is overall evaluated less appropriate than short ones.**



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DISCUSSION AND CONCLUSION

CHOICE AS AN INFORMATION

- + **INTERPLAY BETWEEN INFORMATION STRUCTURE, SYNTAX AND PHONOLOGY** – impact on sentence grammaticality
 - + Exemplar ungrammatical sentences
 - + *Brat *mene/tebe/njega/nju* redovito posjećuje, a sestra ne.
 - + vs. Brat Ivanu redovito posjećuje, a sestra ne.
 - + *Brat *me/te/ga/ju* redovito posjećuje, a sestru ne.
 - + vs. Brat Ivanu redovito posjećuje, a sestru ne.
- + **Here: simple experiments, but theoretically interesting complex sentences**
 - + Dobra studentica socijalne psihologije *mi* donosi brojne nove i zanimljive knjige. vs
 - + Dobra studentica socijalne psihologije donosi *mi* brojne nove i zanimljive knjige. vs
 - + Dobra *mi* studentica socijalne psihologije donosi brojne nove i zanimljive knjige

HVALA!

