Native language processing of cognates in general academic vocabulary in multilinguals
Outline:

• introduction
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• objective and research questions
• materials, methods
• the pilot experiment – tools, results
• applicability
Native language processing of cognates in general academic vocabulary in multilinguals

**general academic vocabulary**

- abstract
- not specific to any scientific field
- cognate (*parcijalan, tendencija, formirati*)
- non-cognate (*podroban, obrazložiti, predodžba*)

**cognates in GAV**

- cognates with Latin and Greek roots → frequent in formal registers of many languages
- “non-concrete, low in imagery, low in frequency, and semantically opaque” (Corson 1997)

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**cognates - processing advantage over non-cognates**

*connectionist processing models* (shared features → more information available)

*affordances* (CLA)

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LIR|LAP conference, Münster, 25-27 March, 2021
Previous studies: cognate processing (advantages)

**Behavioural studies (bilinguals + trilinguals)**

- L1 word association (van Hell and de Groot 1998)
- L1 word association, lexical decision (van Hell and Dijkstra 2002; double cognates with L2 or L3)
- L2 lexical decision (Dijkstra et al. 2010)
- L1 lexical decision, (L1/L2, L1/L3 cognates, Van Hell and Dijkstra 2002; L1/L2/L3 cognates, Szubko-Sitarek 2011)
- L3 lexical decision, triple cognates (Lemhöfer, Dijkstra, and Michel 2004; Szubko-Sitarek 2011)
- L2 form-similar cognates in L1 sentence reading (Lemhöfer, Huestegge, and Mulder 2018, eye tracking).

**Electrophysiological studies**

- L2 lexical decision (Peeters, Dijkstra, and Grainger 2013)
- Translation task (time-locked to L1) (Yudes, Macizo, and Bajo 2010)
- L1, L2 semantic categorisation (Midgley, Holcomb, and Grainger 2011), intermediate-level foreign language learners
- L1 lexical decision (Bice and Kroll 2015), intermediate-level foreign language learners
Previous studies: Croatia

**experimental**

- generalized **lexical decision** task (Cergol Kovačević 2012)
- **lexical decision** (Anđel et al. 2015)

**other perspectives**

- contact linguistics in specific registers (e.g., Papić Bogadi 2015; Perković 2016)
- translatology (e.g., Antunović 2005)
- TLA, third language acquisition (Letica Krevelj and Štokovac 2012, Letica Krevelj 2016)
Objective and research questions

• **objective**: investigate L1 processing of form-similar cognates belonging to an abstract register (Croatian general academic vocabulary) with unbalanced learners of two foreign languages

• Are internationalisms in an abstract register processed more easily than non-internationalisms from the same register?

• Does crosslinguistic awareness influence the extent of such facilitation?

• How does learning foreign languages influence processing in an abstract register of the native language?
Methodology

Words in isolation:

• L1 semantic categorization task
• ERPs
• advantaged sensitivity of ERP technology → intermediate level foreign language proficiency
• continuous measure of processing, direct measure of brain electrical activity

Words in context:

• L1 short-text reading task
• eye tracking
• more ecologically valid for cognate processing in sentences

Experimentally: comprehension - the influence of L2 on L1

Pen-and-paper: crosslinguistic awareness (L1, L2, L3)
Stimuli

- popular science literature (*Facta* – an imprint of Algoritam)
- Croatian Psycholinguistic Database
- cognate and non-cognate vocabulary (formirati vs. obrazložiti)
- Croatian - (German) - English
- corpus frequencies $\rightarrow$ hrWaC
- abstractness ratings $\rightarrow$ CPD (+ supplemented)
- subjective frequency ratings $\rightarrow$ participants
Participants

• university students, N~40-45

• intermediate-level (B1+/B2) proficiency in English

• pre-intermediate (A2/A2+) proficiency in German

• form-similar cognates present in many languages → participants actively familiar with them in Croatian and English
Pretesting

Language proficiency:
- *Dialang* - English, German
- non-speeded lexical decision + vocabulary in context

Cross-linguistic awareness:
- VerT
  - multilinguals notice cognates as affordances (Berthele 2008; Otwinowska-Kasztelanic 2011)
  - productive cognate sensitivity in L1, L2 and L3
  + 
  - verbal pattern recognition (analytical ability)
Experiments
1) EEG (ERPs) – processing cognates in isolation

- **L1 semantic categorization** task
- stimuli: cognate + non-cognate GAV verbs/verbs related to food preparation
- abstractness, frequency
- DV: mean N400 amplitude
2) Eye tracker – processing cognates in context

- 4 short texts
- 2 versions of each text (Latin square design)
  - a) target words = cognates (L1)
  - b) target words = non-cognate variants (L1)
- DV: total fixation time, second pass time, number of regressions
Pilot experiment
Pilot: options

PsyToolkit

- program & run cognitive-psychological experiments
- all-in-one: design, collect, store, analyze, download
- experiments library, online documentation, examples (lexical decision, go/no go)
- non-commercial
- phones/keyboards?

GORILLA™
experiment builder

- slightly less intuitive
- more elegant
- attention, decision making, memory
- linguistics: (audio) naming task, categorization task, self-paced whole sentence reading, vocabulary learning (multiple choice, forced recall)...
- eye tracking – beta options

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Pilot: task

• semantic categorization: food preparation/gen. ac. voc.
• stimuli: verbs – 120 (C, NC, FP)
• 12 practice items

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<th>Participants (summary)</th>
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<td>N (participants)</td>
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<td>M (N of foreign languages)</td>
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<td>average proficiency in L2 (English)</td>
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<td>average proficiency in L3 (German/Spanish/Italian)</td>
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<td>average proficiency in L4</td>
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Pilot: results

- 2 non-cognates causing confusion: požraniti (to store); sačinjavati (to be comprised of)/začiniti (to season)

- repeated measures ANOVA: $F(2, 58) = 8.78$, $p < .001$, $\eta^2 = 0.232$
- post hoc tests:
  - cognates/non-cognates; $t = -3.542$, $p = .002$, $d = -.647$
  - cognates/foodprep; $t = 0.168$, $p = .867$, $d = .031$
  - non-cognates/foodprep; $t = 3.710$, $p = .001$, $d = .677$
The cognate facilitation effect during semantic categorization?

- GAV cognates categorised faster than GAV non-cognates as belonging to academic vocabulary
- cognate and non-cognate GAV verbs - not stat. sig. different in abstractness ratings or frequency
- morphological cues \( \rightarrow \) internationalism \( \rightarrow \) more likely to belong to the academic language register
- non-cognate GAV verbs require a deeper level of processing (a more detailed access to meaning) in order to be categorized?
- not sufficient - “miksati” (to mix/mixen), “dinstati” (dünsten), “panirati” (panieren), “karamelizirati” (caramelize, karamellisieren)

- do faster behavioural responses in a semantic categorization task actually mirror facilitated processing of meaning or was the categorisation more oriented towards identifying the verb as an abstract internationalism (as opposed to concrete verbs and non-cognate abstract GAV verbs) by recognising specific letter clusters?
Applicability

**content**
– cognate facilitation effect → abstract register, L1 context

**methodology**
– semantic processing (electrophysiological + behavioural perspective)
– a new CLA measure – abstract register

**implications**
– experimental assessment of the importance of an integrative approach in FL teaching (developing cross-linguistic awareness)
– deep reading of young adults (study materials) - understanding abstract words
references I:


references II: