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Cross-Linguistic Influence in Multilinguals:

Do dominance and recency play a role?

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Dominance in CLI

Models

Dominance may override structural similarity in CLI

- Scalpel model (Slabakova 2017)
- Linguistic Proximity Model (Westergaard 2021)

Findings

Dominance plays a role in CLI

- Rah 2010
- Fallah & Jabbari 2016
- Angelovska 2020

Dominance does not play a role in CLI

- Puig-Mayenco et al 2018
- Lloyd-Smith et al 2018

*instruction language

Recency* in CLI

Findings

- Stevens 2021
  - Language of instruction (Norwegian or English) **does not** significantly affect the rate of V2 construction selection (explored in their study.
  - However: the interaction between the phase of the experiment (pre- and post-exposure to syntactic rules of the Mini Artificial Language) and language of instruction **is** significant
    - Before receiving training in syntactic rules of the MAL, groups did perform significantly differently in rate of V2 construction selection

Primary question:

Do dominance* and recency** play a role in CLI at the initial stages of language acquisition?

*Dominance = use/activation of one language more of the time
**Recency = experiment instructions and the language participants learn through

Research questions

1. Does dominance influence morphosyntactic choices in the initial stages of language acquisition? Do participants make choices which are more Polish-like if they are more dominant in Polish?
2. Does recency influence morphosyntactic choices at the initial stages of acquisition?
3. Are there differences between L1 Polish speakers and Polish HS regarding their dominance in Polish? How does this affect their choices?
4. How do different construction types affect the Polish-like choices? Are the effects of dominance and recency different based on this?

Participants

- Polish-English bilinguals living in Poland and England (L1 and HS)
- Recruited via Prolific
- 98 participants
- Dominance
  - LSBQ score
  - Continuous scale for dominance
- Recency
  - Polish-recency vs English-recency group
- HS or L1 Polish speaker

Participant group	n	Age			Age of Immigration		
		Mean	Range	SD	Mean	Range	SD
Polish recency Poland	17	22.1	20 – 27	2.1	-	-	-
English recency Poland	17	24.4	19 – 35	4.7	-	-	-
Polish recency UK L1	18	37.9	23 – 49	8	25.8	18 – 35	4.9
English recency UK L1	16	36.1	25 – 43	5.9	22.6	19 – 31	3.1
Polish recency UK HS	13	27.8	21 – 41	6.2	7.4	0 – 10	2.6
English recency UK HS	17	27.67	19 – 40	7	7.2	0 – 9	2.9

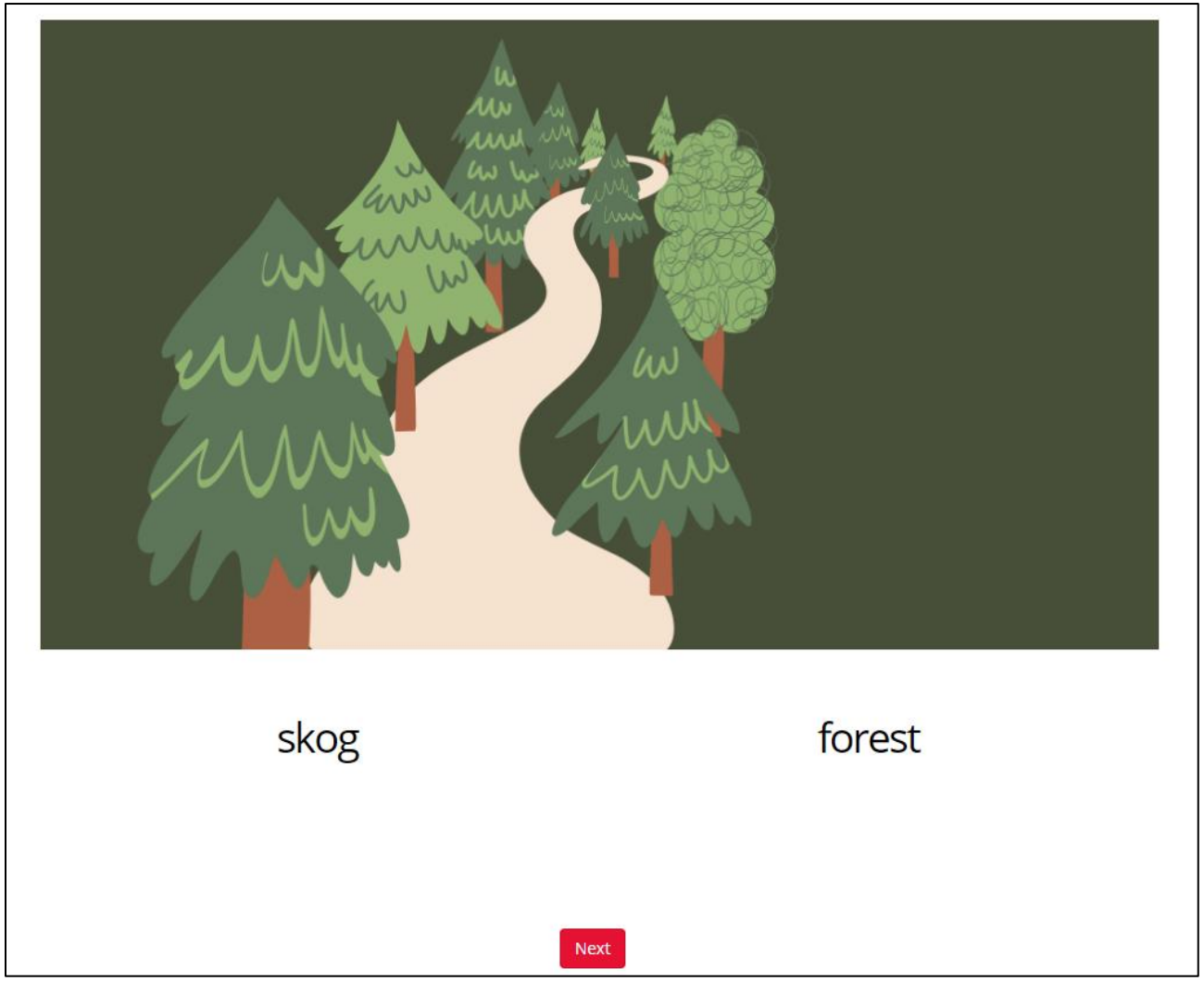
Study design

Two groups for recency:

- English-instruction version of the experiment
- Polish-instruction version of the experiment

1. Vocabulary exposure of 36 lexical items
2. Picture-label matching task
3. **Main experiment – forced-choice judgement task**
4. Mini post-experiment task questionnaire
5. Proficiency task English
6. Proficiency task Polish
7. Language background questionnaire

Vocab exposure



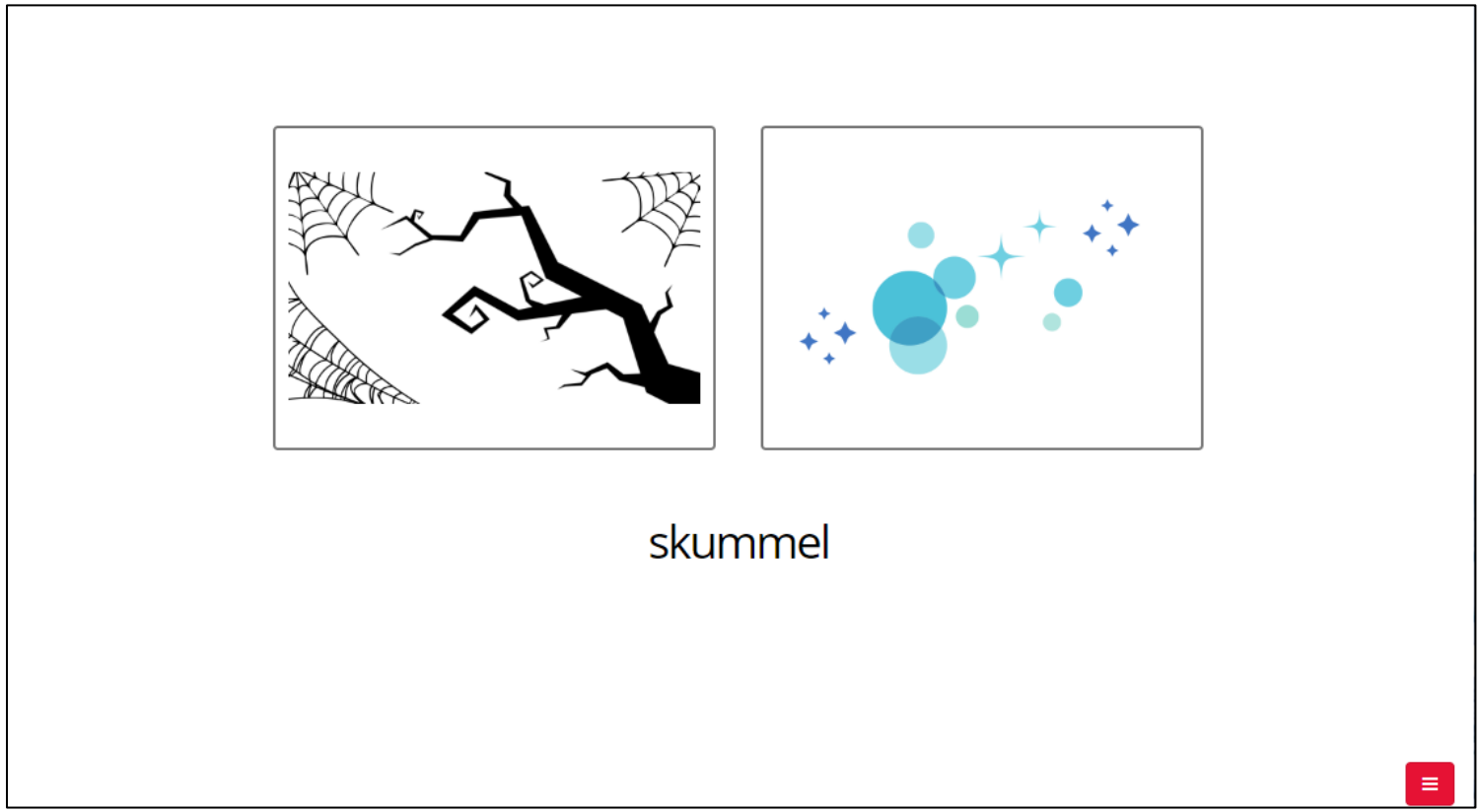
- All lexical items were chosen very carefully **to avoid lexical similarities** between:
  - Norwegian and English
  - Norwegian and Polish
  - Norwegian and German (disguising the language so no choice can be made based on lexical similarity)

- Gender of nouns are the same in Polish and Norwegian

- No auditory stimuli – avoiding choices based on phonological similarity

- Mandatory to do twice, can do as many times as desired after this

Picture label matching task



- The same pictures that they learned a concept with in exposure are used in this task

- Given two chances at this, if they get at least 80%, move on, if not, finish experiment there (Puig-Mayenco et al 2018; González Alonso et al 2020)

Main experiment

- Forced-choice judgement task
- Four constructions:
  - Polish-like:
    - Number agreement
    - Semantic gender
  - English-like:
    - Articles
    - Ditransitives
- 54 sentence pairs per person, 2 lists

Key idea: Assessing dominance and recency based on the number of **Polish-like choices** they made, NOT on their accuracy in Norwegian – they have only just learned 36 words in Norwegian.

Looking closer: Constructions

Polish-like

Semantic gender

[garden image]

Han er vakker.*	Det er vakker.
He is beautiful.	It is beautiful.
'He is beautiful'	'It is beautiful'

Number agreement

[Lucas and Adam]

Lucas og Adam er stor-e.	Lucas og Adam er stor.
Lucas and Adam are big-PL	Lucas and Adam are big.SG
'Lucas and Adam are big.'	'Lucas and Adam are big'

English-like

Ditransitives

[Man showing a pencil to Simon]

Han viser blyant-en til Simon	Han viser blyant-en Simon
He shows pencil-ART to Simon	He shows pencil-ART Simon
'He shows a pencil to Simon'	'He shows a pencil Simon.'

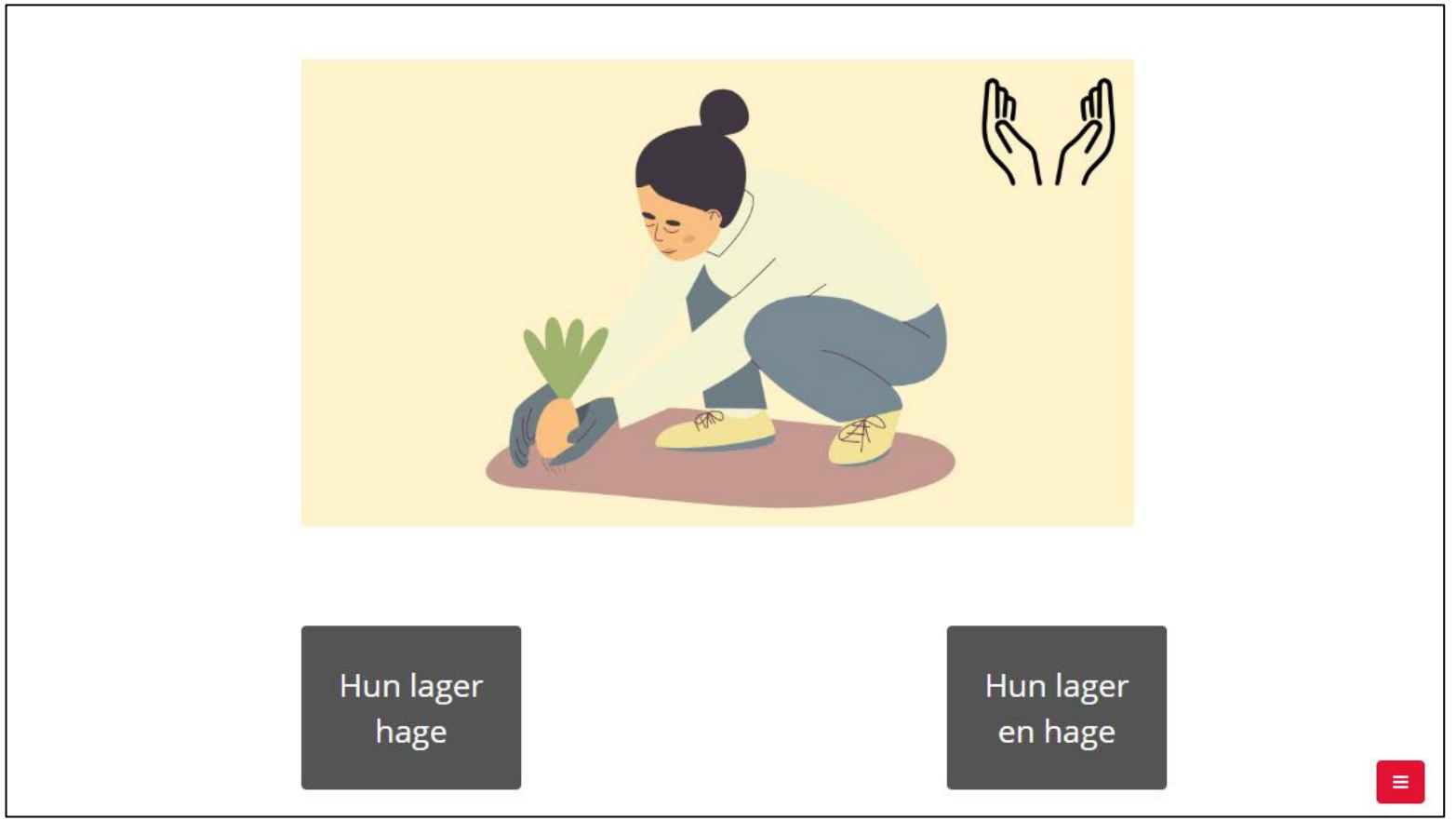
Articles

[Woman discovering a car]

Hun oppdager en bil	Hun oppdager bil
She discovers ART car	She discovers car
'She discovers a car.'	'She discovers car.'

*this is used in some Northern Norwegian dialects only

Main experiment – forced choice judgement task



- 18s to choose a sentence (mean + 2SD of pilot RT)
- 12 sentences for each construction
- Also semantic gender controls – for exclusion purposes (6 sentences)

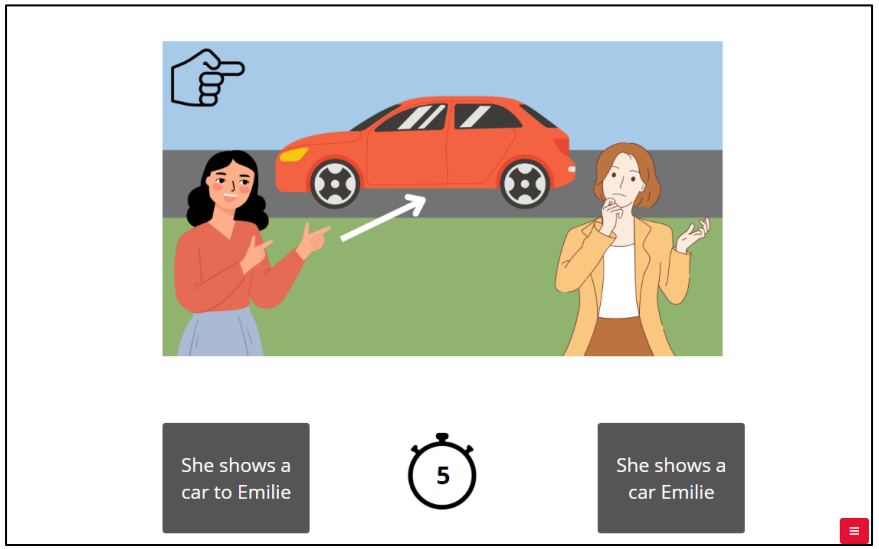
Mini post-experiment task questionnaire

- Which language they thought it was
- Which language they were thinking in
- What they think was being assessed
- Whether they think the new language is more similar to Polish or English

‘Proficiency tasks’ English and Polish

English

- Same as the main task, with the English-like constructions (ditransitives and articles), 8s (mean +2SD)
- Expect a high score – to show they know these constructions in English



Polish

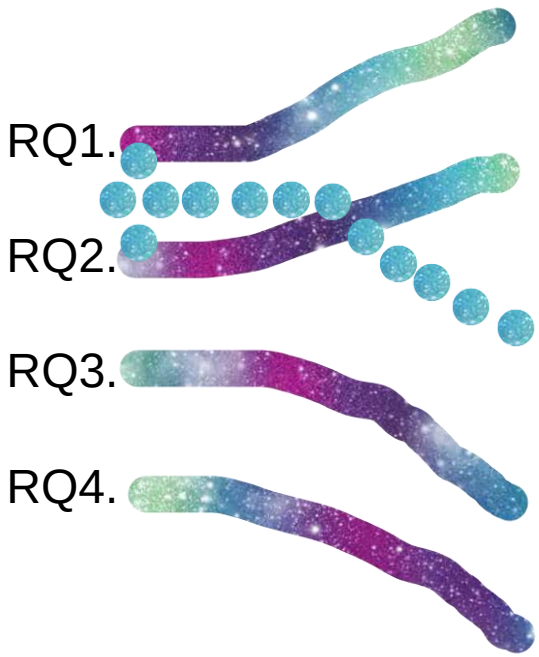
- Same as the main task, with the Polish-like constructions (number agreement and semantic gender), 8s (mean + 2SD)
- Expect a high score – to show they know these constructions in Polish

Dominance scale - LSBQ

- Language and Social Background Questionnaire: a measure of degree of bilingualism
    - Assumption here that, e.g., more monolingual on the scale = more dominant in Polish (as L1), more bilingual = more dominant in English
    - Questions about language use in different domains
    - Can be used as a continuous variable (increased power)
    - Recognises that language use is dynamic
    - Addresses deficiencies of self-report through multiple questions that are demonstrated through factor analysis to be reliably related

Hypotheses

Key idea: Assessing dominance and recency based on the number of **Polish-like choices** they made, NOT on their accuracy in Norwegian – they have only just learned 36 words in Norwegian.



H1: Participants more dominant in Polish will choose more Polish-like constructions, and participants more dominant in English will choose more English-like constructions.

H2: Those in the Polish recency group will select more Polish-like constructions than those in the English recency group.

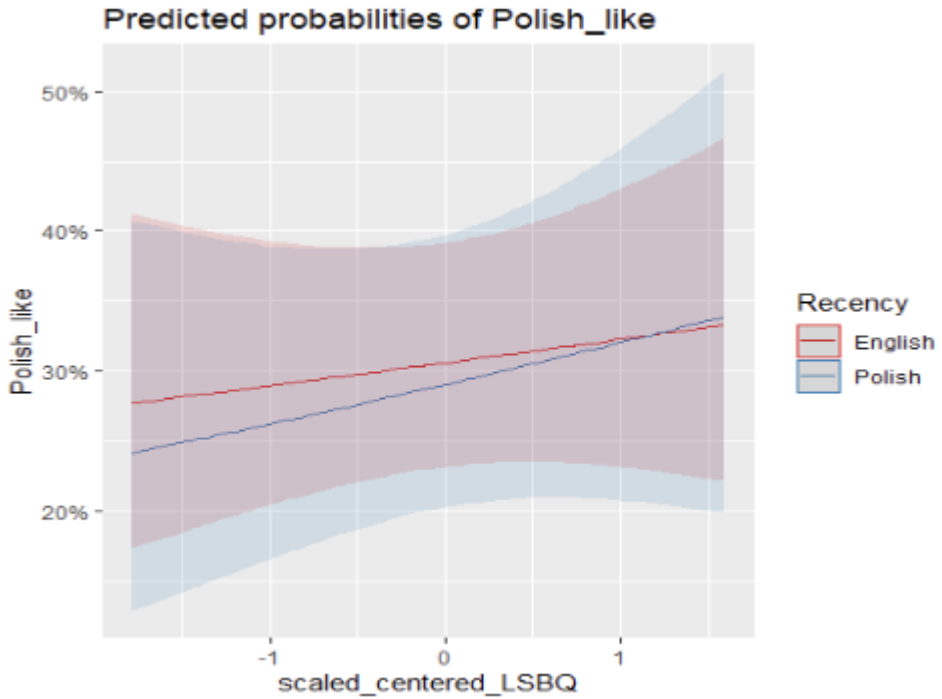
H3: Participants dominant in Polish in the Polish recency group will choose the most Polish-like constructions, and participants dominant in English in the English recency group will choose the most English-like constructions, i.e., for the same level of dominance, those with Polish recency will make more Polish-like choices, and those with English recency will make more English-like choices.

H4: Polish HS will make more English-like choices than the other groups, as they will be more dominant in English.

H5: Participants will behave differently for different constructions (articles, ditransitives, number agreement, semantic gender).

Results: Confirmatory analysis L1 speakers

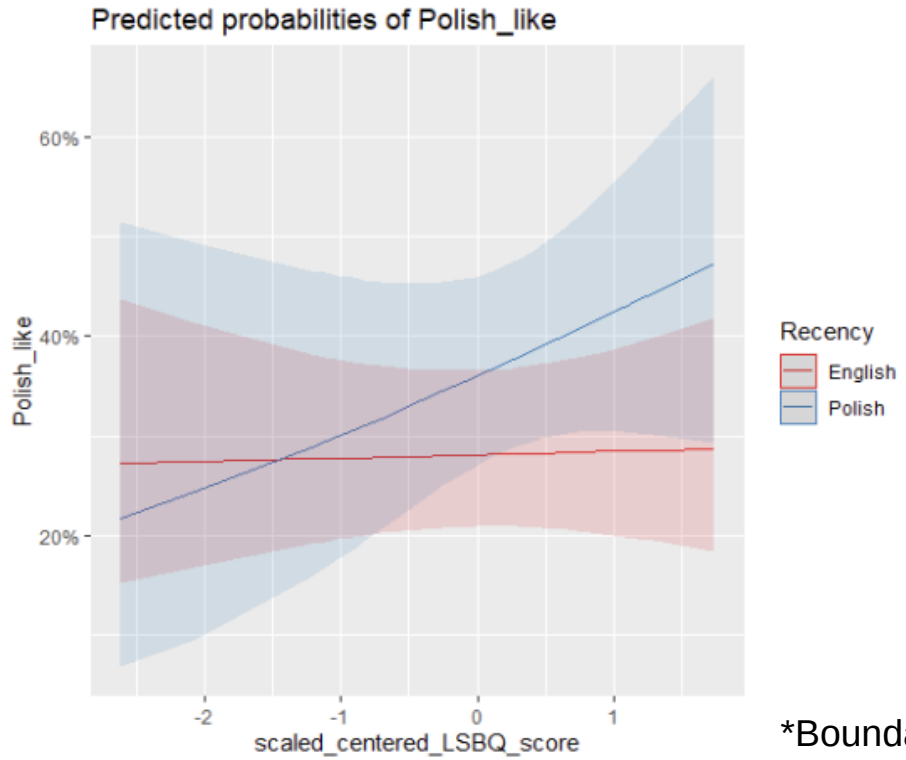
- mdl <- glmer(Polish_like ~ **Recency*scaled_centered_LSBQ** + (**Construction**|Participant_No) + (1|Picture), control = glmerControl(optimizer='bobyqa'), family=binomial, data=dat)



	Polish_like		
Predictors	*Odds Ratios*	*CI*	*p*
(Intercept)	0.42	0.29 – 0.62	**<0.001**
Recency1	1.04	0.80 – 1.34	0.780
scaled centered LSBQ	1.12	0.86 – 1.45	0.412
Recency1 × scaled centered LSBQ	0.97	0.74 – 1.26	0.817
Random Effects			
σ^2	3.29		
$\tau_{00\ Participant\_No}$	1.56		
$\tau_{00\ Picture}$	0.19		
$\tau_{11\ Participant\_No.Construction1}$	3.57		
$\tau_{11\ Participant\_No.Construction2}$	1.96		
$\tau_{11\ Participant\_No.Construction3}$	4.70		
$\rho_{01\ Participant\_No.Construction1}$	0.32		
$\rho_{01\ Participant\_No.Construction2}$	0.35		
$\rho_{01\ Participant\_No.Construction3}$	-0.65		
ICC	0.35		
$N_{Participant\_No}$	68		
$N_{Picture}$	48		
Observations	3264		
Marginal R^2 / Conditional R^2	0.003 / 0.349		

Results: Confirmatory analysis HS speakers

- mdl <- glmer(Polish_like ~ **Recency*scaled_centered_LSBQ** + (**Construction**|Participant_No) + (1|Picture), control = glmerControl(optimizer='bobyqa'), family=binomial, data=dat)



*Boundary fit is singular

	Polish_like		
Predictors	*Odds Ratios*	*CI*	*p*
(Intercept)	0.22	0.05 – 0.94	**0.041**
Recency1	1.62	0.41 – 6.35	0.490
LSBQ score	1.05	0.96 – 1.16	0.270
Recency1 × LSBQ score	0.95	0.87 – 1.05	0.326
Random Effects			
σ^2	3.29		
$\tau_{00\ Picture}$	0.27		
$\tau_{00\ Participant\_No}$	0.60		
$\tau_{11\ Participant\_No.Construction1}$	1.42		
$\tau_{11\ Participant\_No.Construction2}$	1.93		
$\tau_{11\ Participant\_No.Construction3}$	1.65		
$\rho_{01\ Participant\_No.Construction1}$	0.34		
$\rho_{01\ Participant\_No.Construction2}$	0.58		
$\rho_{01\ Participant\_No.Construction3}$	-0.87		
ICC	0.21		
$N_{Participant\_No}$	30		
$N_{Picture}$	48		
Observations	1440		
Marginal R^2 / Conditional R^2	0.013 / 0.220		

Results: Exploratory analysis L1 speakers

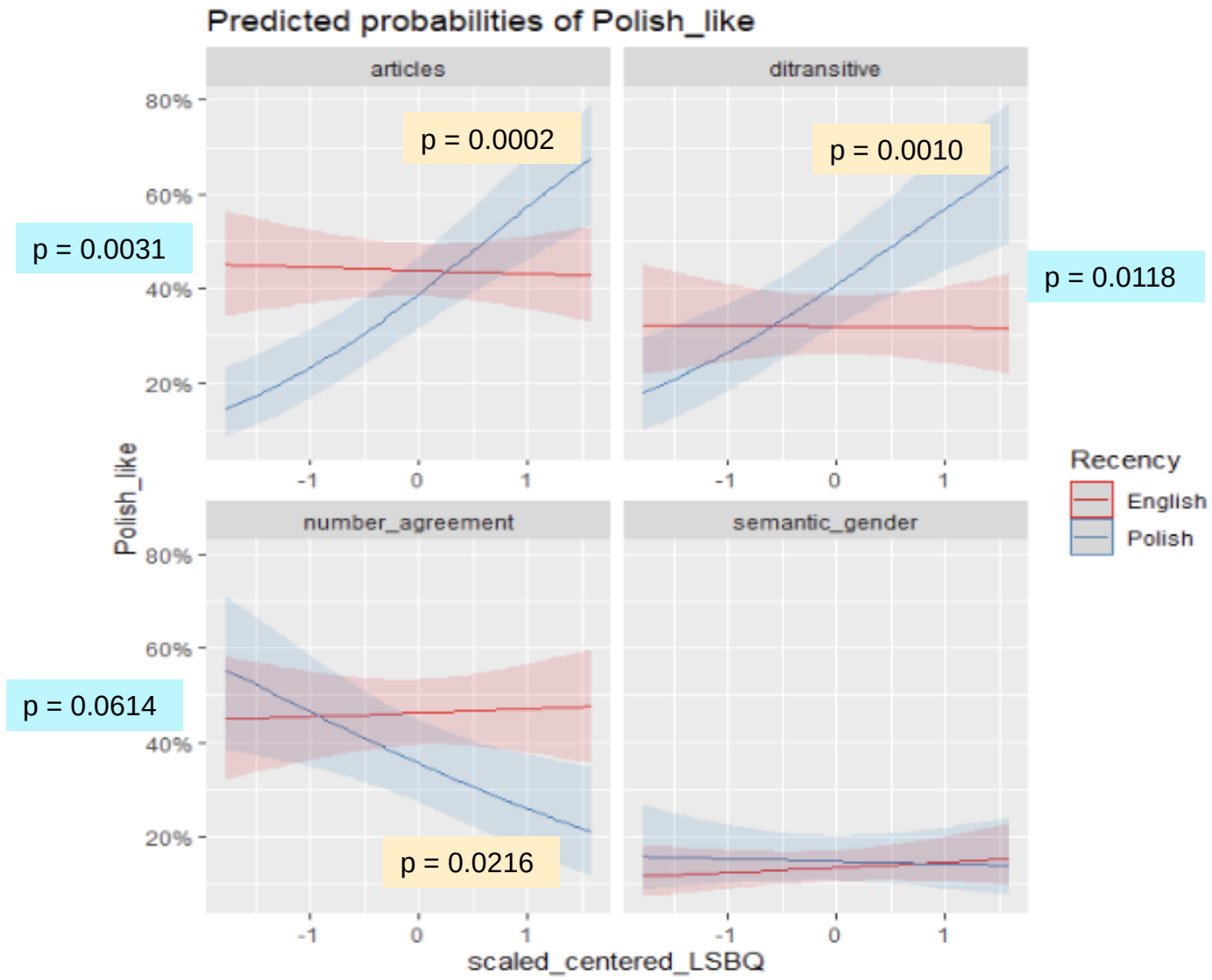
mdl <- glmer(Polish_like ~ **Recency*scaled_centered_LSBQ*Construction** + (1|Participant_No) + (1|Picture), control = glmerControl(optimizer='bobyqa'), family=binomial, data=dat)

Likelihood Ratio Tests:

- A model including an interaction between recency and construction is a better fit, p = 0.001368
- A model including an interaction between recency, construction and LSBQ is a better fit, p = 2.392e-09

Estimate of the effect of LSBQ score for each combination of construction and recency

Comparison of LSBQ score between each recency within construction



Results: Exploratory analysis Heritage speakers

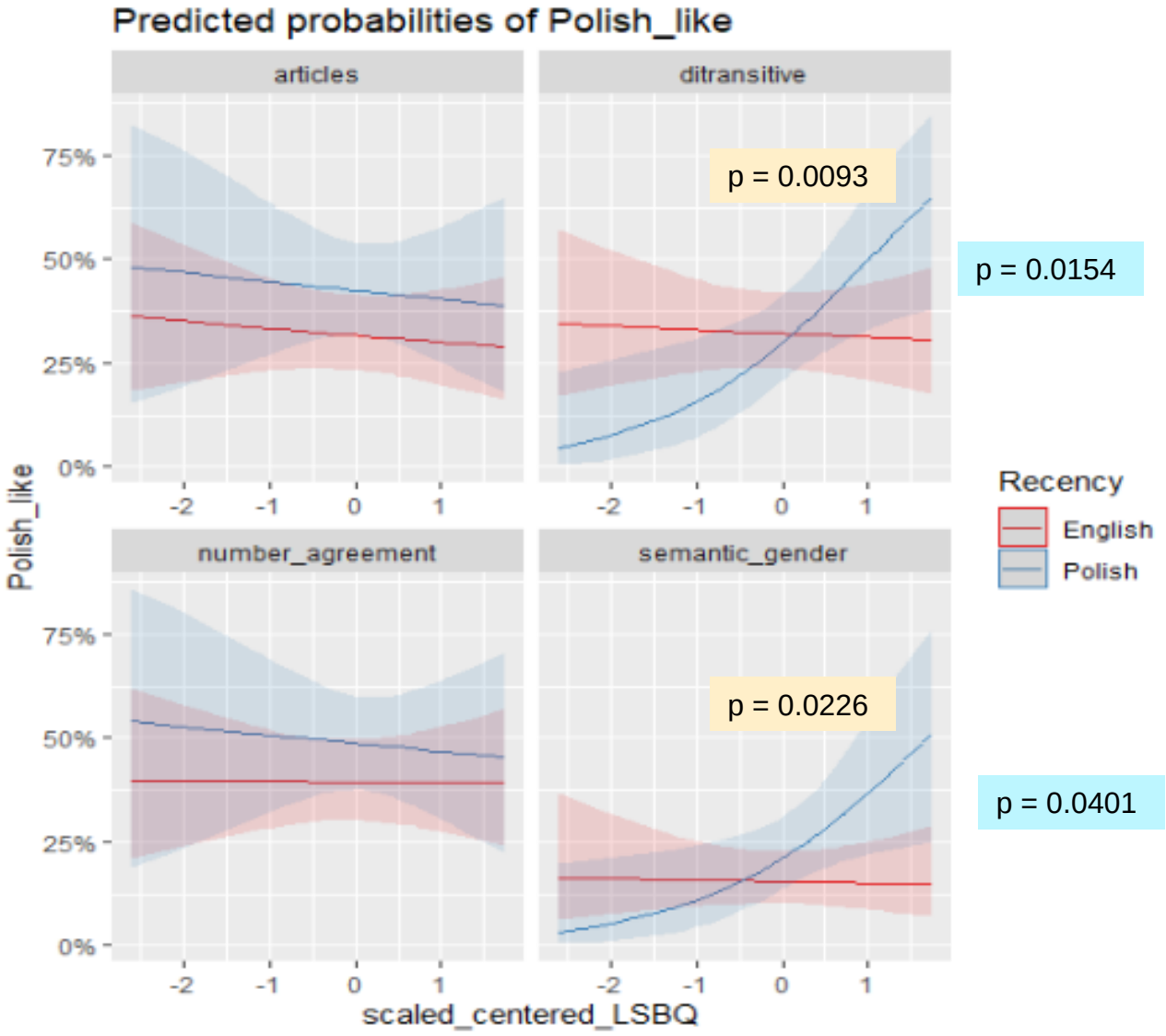
mdl <- glmer(Polish_like ~ **Recency*scaled_centered_LSBQ*Construction** + (1|Participant_No) + (1|Picture), control = glmerControl(optimizer='bobyqa'), family=binomial, data=dat)

Likelihood Ratio Tests:

- A model including an interaction between recency, construction and LSBQ is a better fit, p = 0.02308

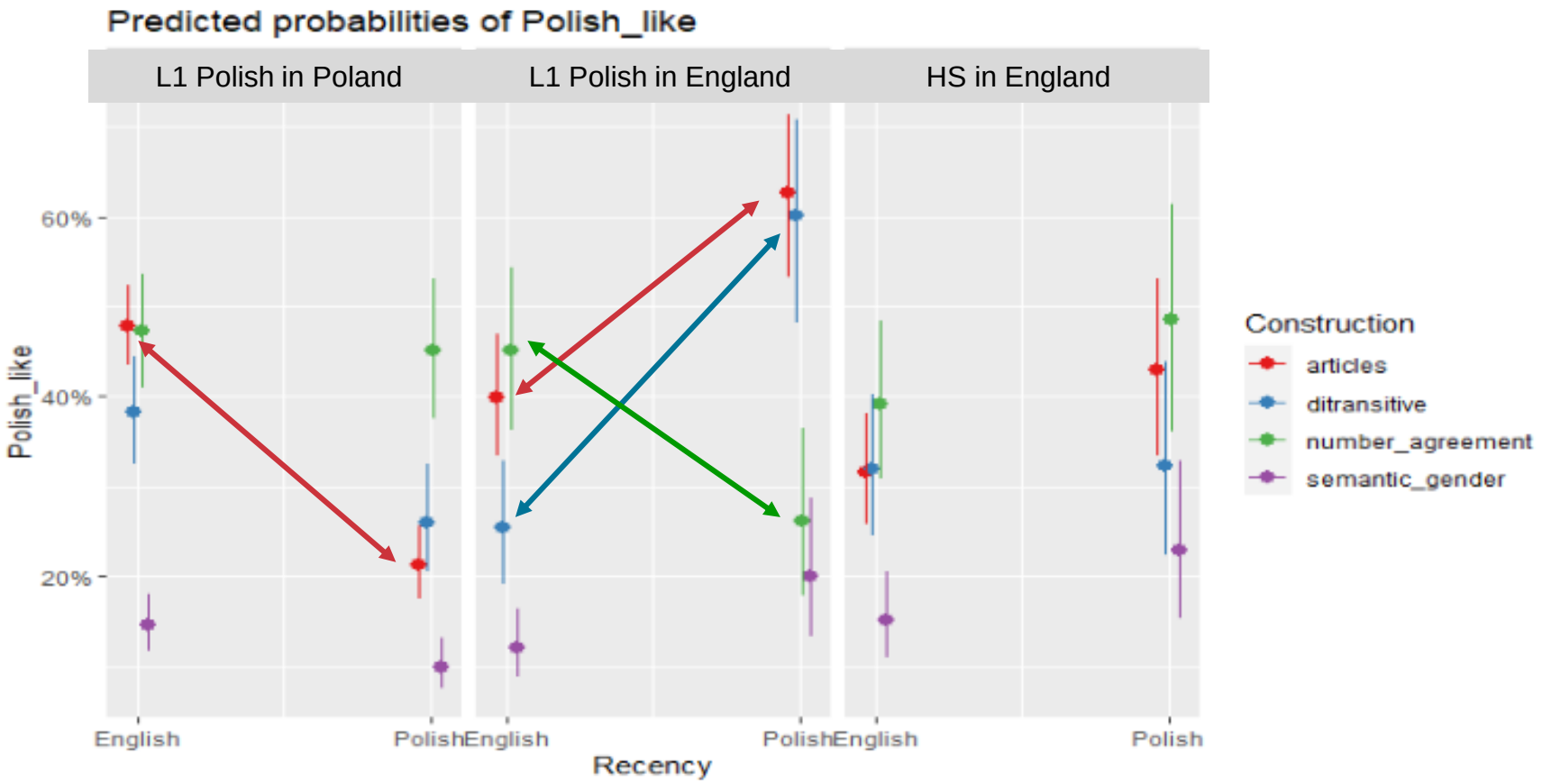
Estimate of the effect of LSBQ score for each combination of construction and recency

Comparison of LSBQ score between each recency within construction



Results: Exploratory analysis by group

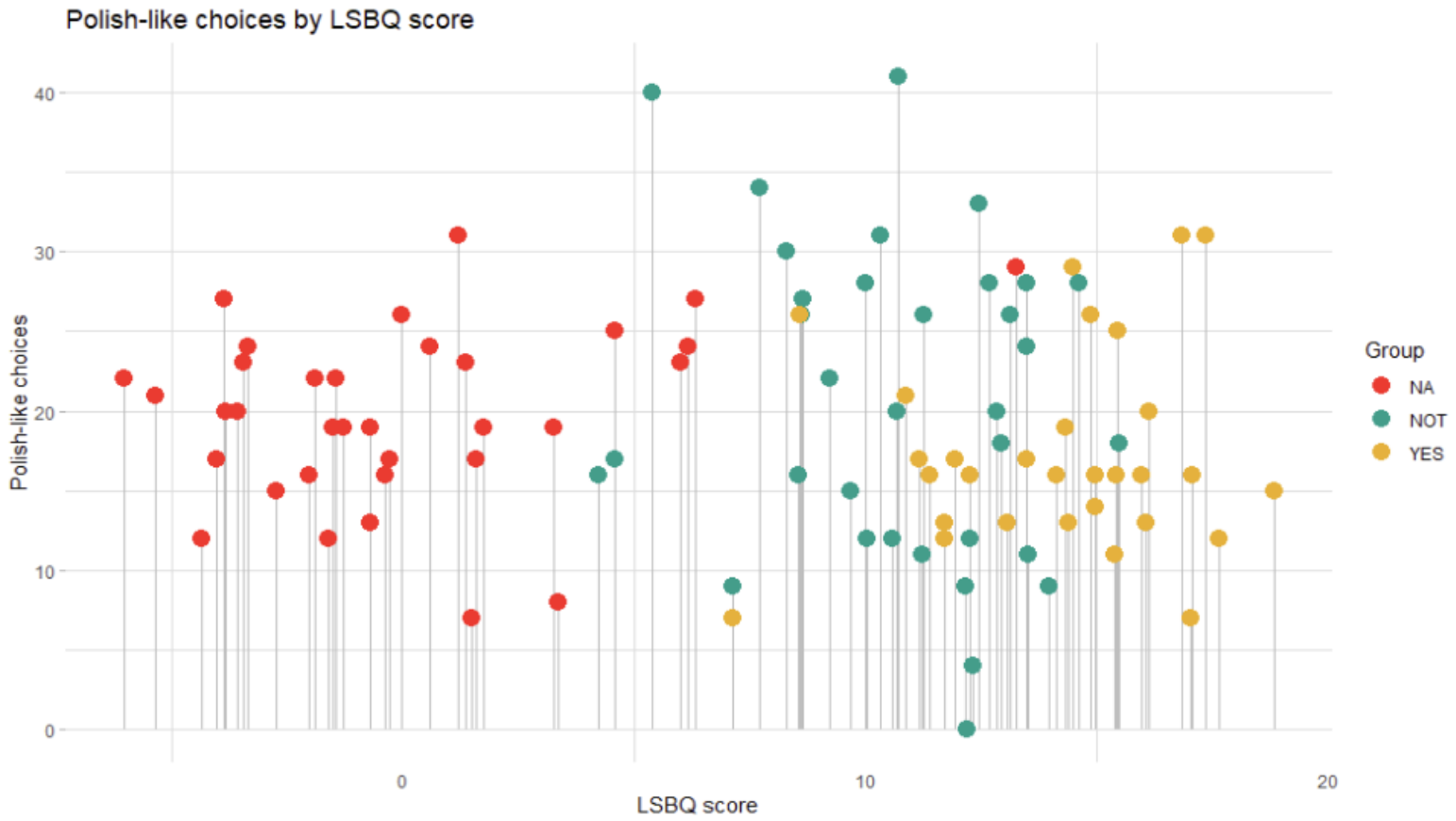
Assessing Recency and Construction



<u>Between English and Polish recency</u>

- **Article construction, L1 Polish in Poland:** sig diff, p = 0.0003
- **Article construction, L1 Polish in England**: sig diff, p = 0.0054
- **Distransitive construction, L1 Polish in England**: sig diff, p < 0.0001
- **Number agreement, L1 Polish in England**: sig diff, p = 0.0122

LSBQ score and group



Pairwise comparisons using t tests with pooled SD

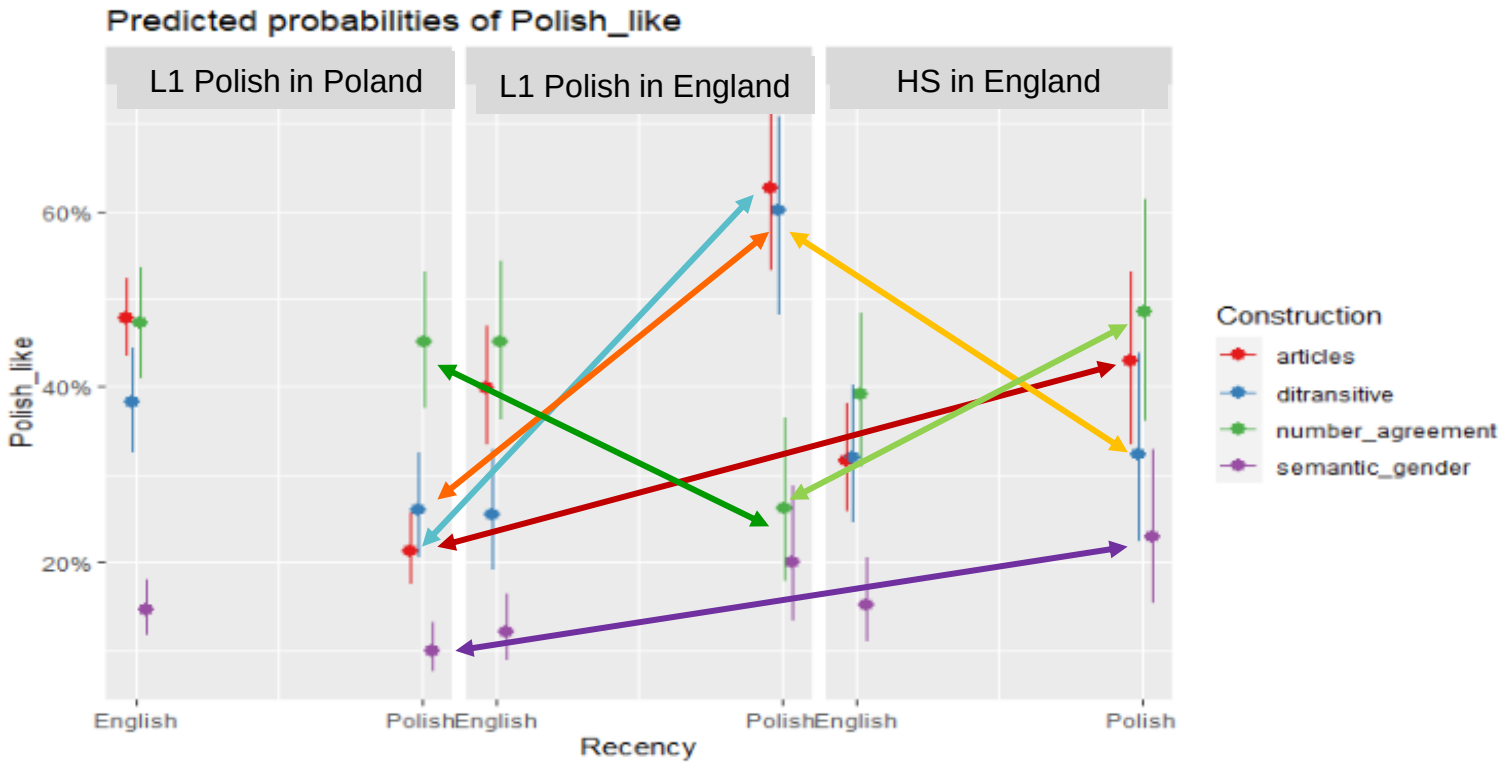
data: datb$LSBQ_score and datb$Heritage_Speaker

	NA	NOT
NOT	<2e-16	-
YES	<2e-16	<2e-16

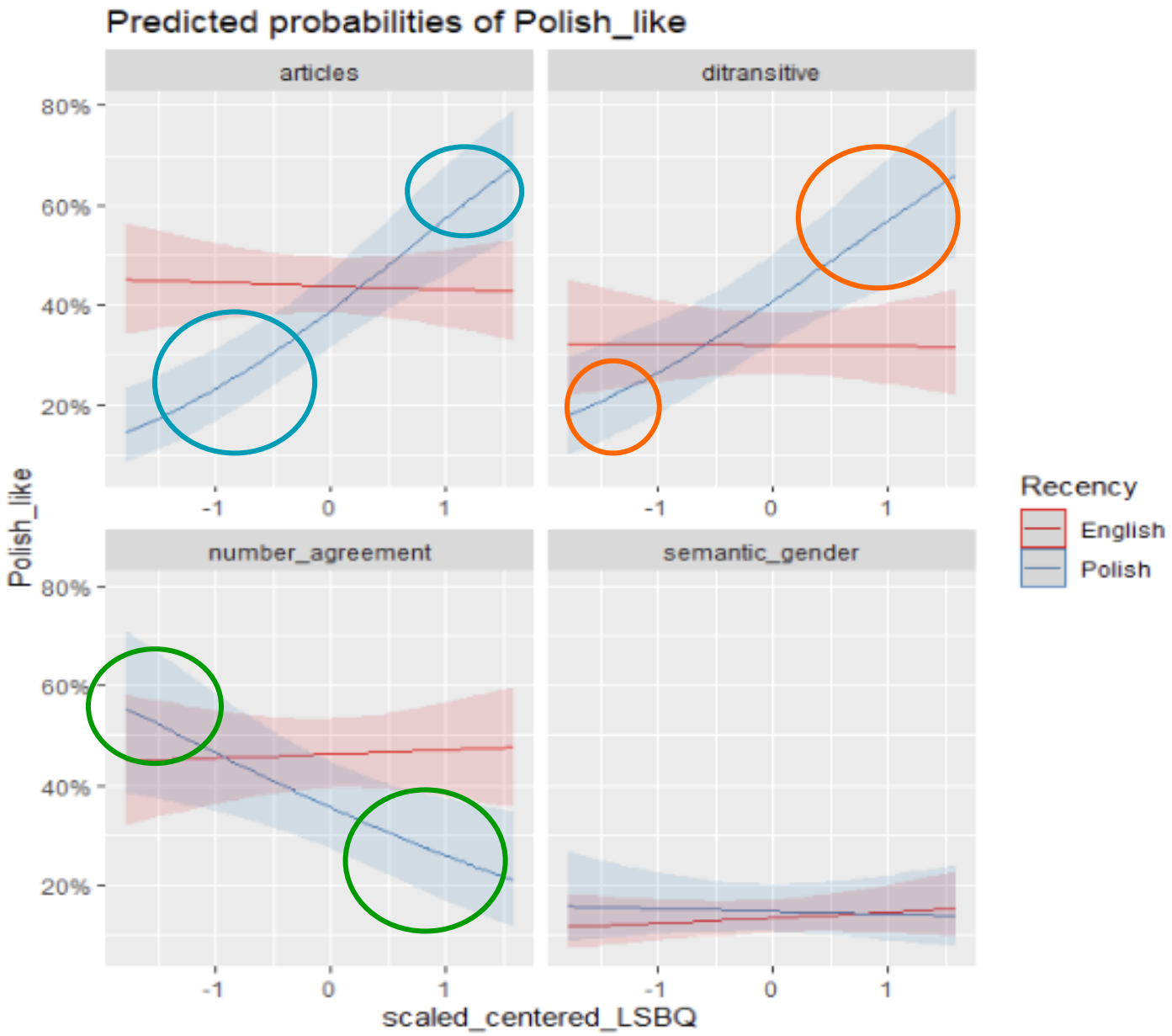
P value adjustment method: holm

Results: Exploratory analysis by group

Assessing Across Groups: Matching Patterns



- **Polish Recency, article construction**: sig diff between L1 Polish in Poland and L1 Polish in England, and L1 Polish in Poland and HS in England
- **Polish recency, ditransitive construction:** sig diff between L1 Polish in Poland and L1 Polish in England, and between Polish in England and HS
- **Polish recency, number agreement construction:** sig diff between L1 Polish in Poland and L1 Polish in England, and L1 Polish in England and HS
- **Polish recency, semantic gender:** sig diff between L1 Polish in Poland and HS



- Differences between L1 Polish in Poland and L1 Polish in England reflected in LSBQ score graph

Discussion

H1
H2
H3

- Polish-recency do not choose more Polish-like choices overall.
- Dominant in Polish do not choose more Polish-like choices overall.
- For the same level of dominance, those with English recency do. not make more English-like choices across the board.
- **Relationships are more complex.**

H4

- HS group only make more English-like choices than the L1 Polish speakers in England in the ditransitive construction.

H5

- Participants do behave differently for different constructions.

Relationships are more complex…

L1 Polish speakers

- Recency plays a role for article, ditransitive, and number agreement.
  - **Drilling down:** This difference only remains when looking between groups for L1 Polish speakers in England (for L1 Polish speakers in Poland, recency only plays a role for article).
  - **Comparing:** Recency does not play a role at all within HS if assessed by group, it does in ditransitive and semantic gender if assessed with LSBQ_score.
- In Polish recency, the more dominant one is in English (the more 'bilingual' they are), the more Polish-like choices they will make – for articles and ditransitives.
  - **Comparing:** This holds only for ditransitives and semantic gender in HS.
- In Polish recency, the more dominant one is in English, the more English-like choices they will make – for number agreement.

Relationships are more complex…

Polish recency

- L1 Poles in Poland make significantly less Polish-like choices than L1 Poles in England for ditransitives and articles, but significantly *more* Polish-like choices for number agreement.
- HS in England make significantly more Polish-like choices than L1 Poles in Poland for articles and semantic gender.
- HS in England make significantly more Polish-like choices than L1 Poles in England for number agreement, and significantly less for ditransitives.

Thoughts

- In CLI research:
  - Construction type must be chosen carefully.
    - Findings based on *1 construction only* may inform theory – but we see that participants behave differently for different constructions.
    - Role of markedness of condition.
  - Language of instruction must be chosen carefully.
    - We see here that participants behave differently based on ‘recency’ for some constructions (and some groups). We see effects in construction and dominance only for Polish recency (which is the L1, one of the L1s).

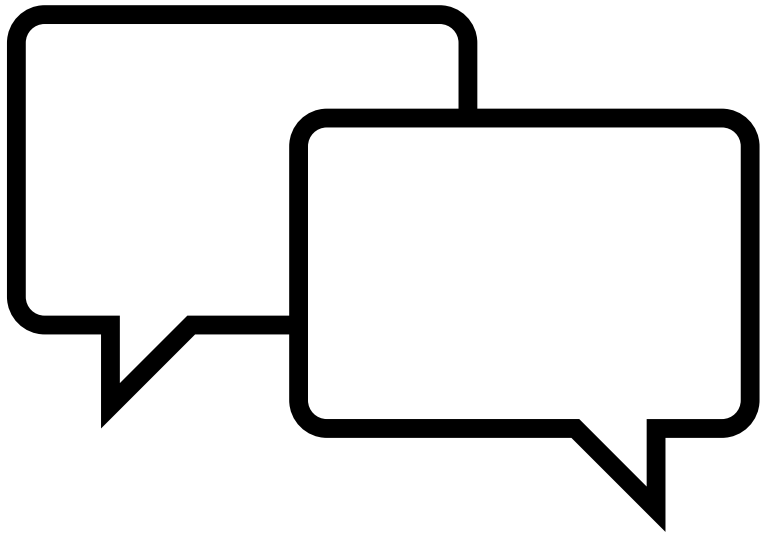
Thoughts

- Role of lexical similarity?
  - Most participants thought the new language was more similar to English.
  - Those dominant in English/more ‘bilingual’ may be more willing to go against lexical similarity (greater bilingual awareness, taking differences into account).
  - Those who are less dominant in English, use English-like choices more (except for no. agreement – around chance) – less balanced, more likely to be influenced by lexical similarity with English.
- Individual differences
  - Some participants chose to align with 1 or the other language (in a construction), some did not – no participants fully aligned with 1 or the other language
- L1s and additional morpheme
  - Preference for added free morpheme amongst those more dominant in English/more ‘bilingual’ (and added bound morpheme in number agreement).
- Recency and balance
  - L1 Poles in England (in the middle of the LSBQ scale) are the most influenced by Recency - use the languages in the most ‘balanced’ way – so language of instruction influences them the most.

Thoughts

- Foreign language effect Polish recency
  - Polish recency – speakers in Poland make choices in alignment with their ‘foreign language’ (where detected by speakers), as they are learning a new ‘foreign language’ (which seems lexically similar).
- Lower proficiency in L2 = greater ‘interference’?
  - When learning an L3 - more advanced L2 learners – better control over L2, reducing ‘negative’ transfer (Sanchez & Bardel 2017; Foryś-Nogala et al 2023)
  - Polish-dominant bilinguals rely more on their L2 (at least in article and ditransitive conditions – around chance for number agreement)
  - More ‘bilingual’/dominant in English, less reliance on L2

Let’s discuss!



Dziękujemy!
Thank you!
Tusen takk!

We thank Kamil Kaźmierski for his comments on data analysis.

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