

# Structural convergence is mediated by perceived linguistic and social proximity

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# Dialogue relies on an internal model of the speaker

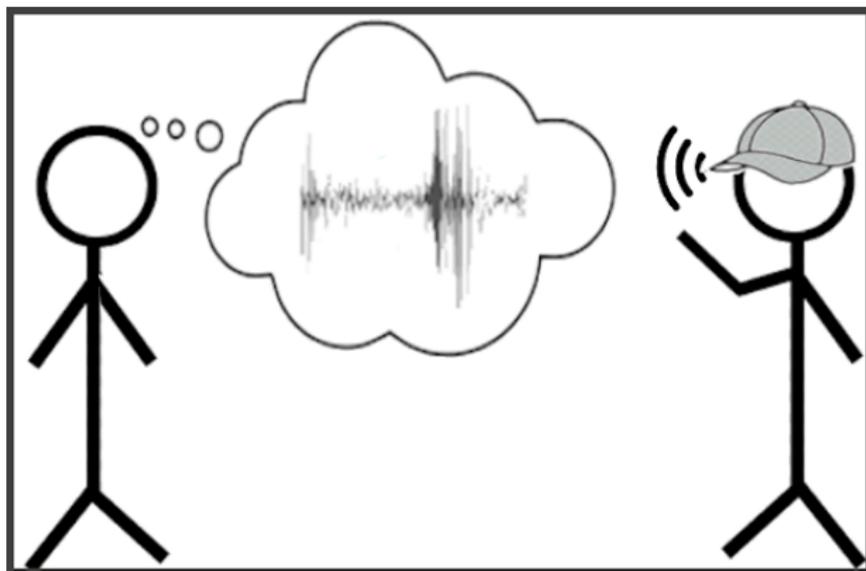
- Language processing in real-time is extremely fast, largely error-free
- This is possible because our language system **generates expectations** about what will come next — an internal speaker model predicts the probabilities of different possible continuations

As we accumulate experience conversing with a particular speaker, we are sharpening our **internal model of that speaker's language usage**. Over time, this increases communicative efficiency.

According to some, a behavioural reflex of this process is **convergence** in dialogue.

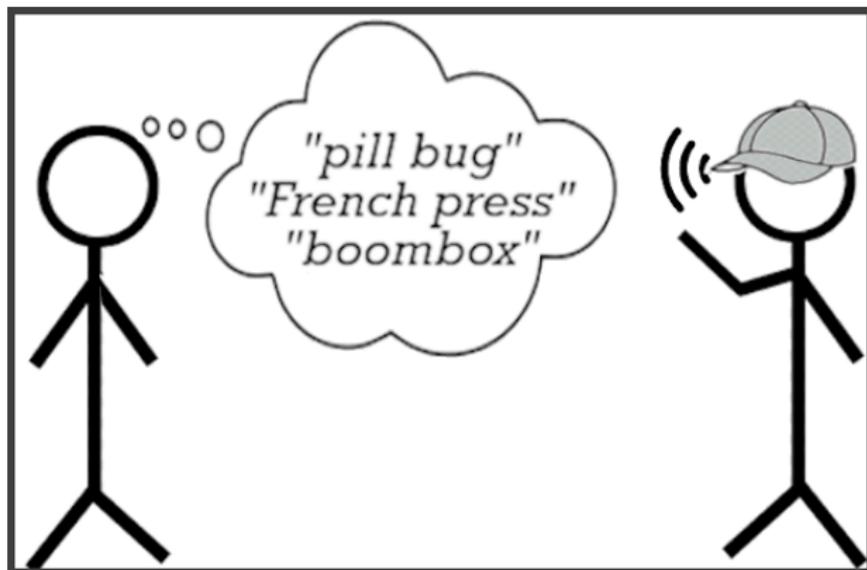
# Phonetic convergence (a.k.a. phonetic accommodation)

People adapt their **speech** to be more similar to that of a speaker they have prior exposure to (Goldinger 1997, 1998; Pardo 2006; Kraljic & Samuel 2007)



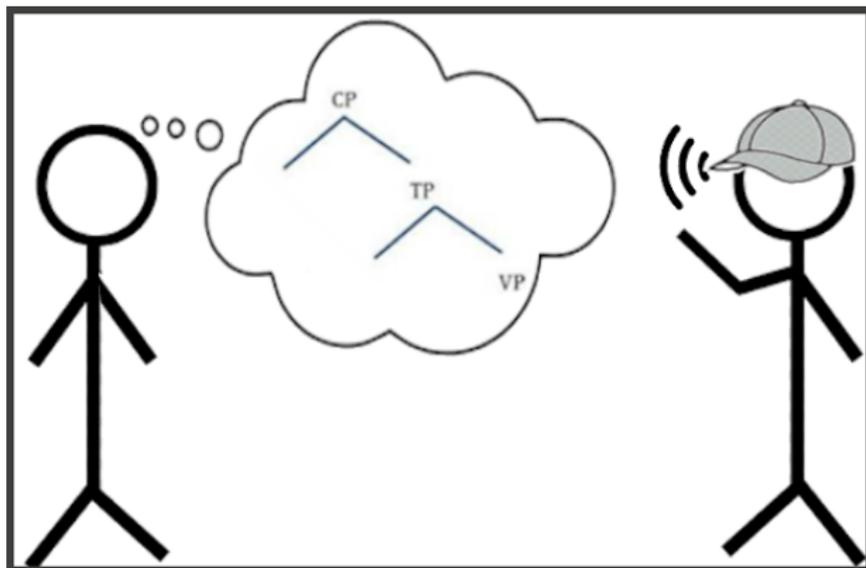
# Lexical convergence (a.k.a. lexical entrainment)

People in dialogue converge on **uniform lexical expressions** to use with each other (Clark & Wilkes-Gibbs 1986; Branigan 2010; Tobar-Henriquez et al. 2021)



# Structural convergence (a.k.a. syntactic priming)

People adapt the **syntactic structures** they use to align with structures used by their interlocutor (Bock 1986; Pickering & Branigan 1998; Bock & Griffin 2000; Kaschak 2007)



The extent of convergence is also modulated by listeners' **perceptions of speaker characteristics** such as the attractiveness of their voice, or the typicality of their accent (McGuire et al. 2011; Babel et al. 2014)

# Explanations for convergence in dialogue

- *A social explanation*: convergence motivated by the listener wanting to increase their similarity to an 'in-group', socially well-positioned individual (Babel 2010, 2014)
- *A cognitive explanation*: convergence driven by automatic processes that detect speech characteristics like typicality, distinctiveness (Kim et al. 2011 [not me])

Does a listener's adaptation of **syntactic forms** they produce depend on their perceptions about/stance toward their interlocutor wrt **social proximity**?

- 1 Using structural priming to measure convergence**
- 2 Exp1: Convergence across speakers with different L1s
- 3 Exp2: Convergence across speakers of different varieties of English
- 4 Conclusions & remaining questions

# Using structural priming to measure convergence

- Language production: produce one syntactic alternant over another  
→ more likely to produce that form again on a subsequent utterance  
(Bock 1986; Bock & Loebell 1990; Griffin & Bock 2000; Ferreira et al. 2005; Chang et al. 2006; many others)

## Dative alternation

DOUBLE OBJECT (NP NP): *Jill showed Beth the drawing.*

PREPOSITIONAL DATIVE (NP PP): *Jill showed the drawing to Beth.*

## Passive alternation

ACTIVE: *The journalist interviewed the politician.*

PASSIVE: *The politician was interviewed by the journalist.*

# Using structural priming to measure convergence

- Why would using a syntactic form make it easier to re-use later?  
Different theories about underlying mechanism ...  
(Branigan et al. 1999; Traxler et al. 2014; Bock & Griffin 2000; Chang et al. 2000; Ferreira et al. 2005; Kaschak et al. 2011)
- Here: Use **extent of structural priming as a measure of convergence** with an interlocutor in a dialogue task (cf. Garrod & Pickering 2004 on syntactic alignment)

- 1 Using structural priming to measure convergence
- 2 **Exp1: Convergence across speakers with different L1s**
- 3 Exp2: Convergence across speakers of different varieties of English
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# Native speaker effects

- Previous work: people tend to converge more with native speakers than non-native speakers (Kim & Chamorro 2021)
- But: native speaker status bound to align with perceived social proximity in **native English speaker** participants

	confederate	
	native BrE	non-native
predictions from nativeness	+	-
predictions from social proximity	+	-

# Native speaker effects

- Previous work: people tend to converge more with native speakers than non-native speakers (Kim & Chamorro 2021)
- But: native speaker status bound to align with perceived social proximity in native English speaker participants
- **Exp1:** participants: **native Spanish speakers**, confederates: L1 English, L1 Spanish, L1 Slovak

	confederate L1		
	English	Spanish	Slovak
pred. from nativeness	+	-	-
pred. from social proximity	-	+	-

## Questions:

Does perceived **social proximity** lead to greater convergence when not aligned with native speaker status?

Do native speaker status and social proximity have independent effects on convergence?

# Exp1 — picture-matching game

- Participants played a picture-matching game with a confederate — take turns with another speaker to describe scenes depicting ditransitive events

# Exp1 — picture-matching game



READ

# Exp1 — picture-matching game



SHOW

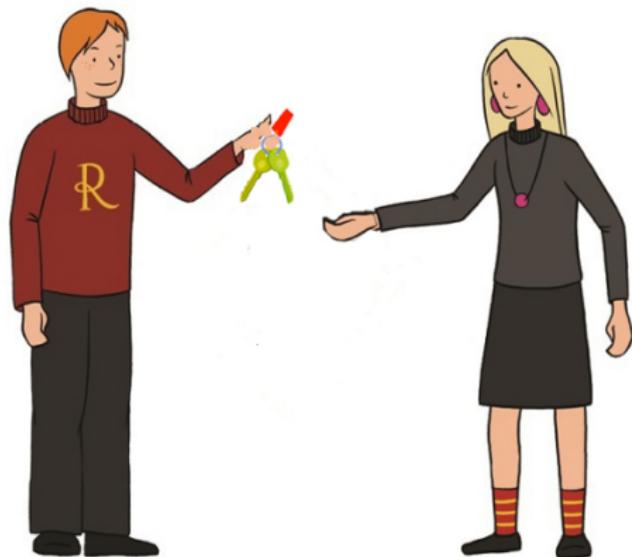
# Exp1 — picture-matching game

- Participants played a picture-matching game — take turns with another speaker to describe scenes depicting ditransitive events
- Both participants and confederates joined a video-conferencing call with audio only/cameras off – participants were shown displays, while confederates followed a script
- **Speaker type** (native **BrEng**, non-native/**L1 Spanish**, non-native/**L1 Slovak**) manipulated between subjects
- **Verb type** (**alternating**/DO acceptable in English, **non-alternating**/DO unacceptable in English) within subjects

# Exp1 — alternating verbs

DO: ✓ *Ron is handing Luna the keys.*

PD: ✓ *Ron is handing the keys to Luna.*



HAND

# Exp1 — non-alternating verbs

DO: \**Harry is displaying Luna his trophy.*

PD: ✓ *Harry is displaying his trophy to Luna.*

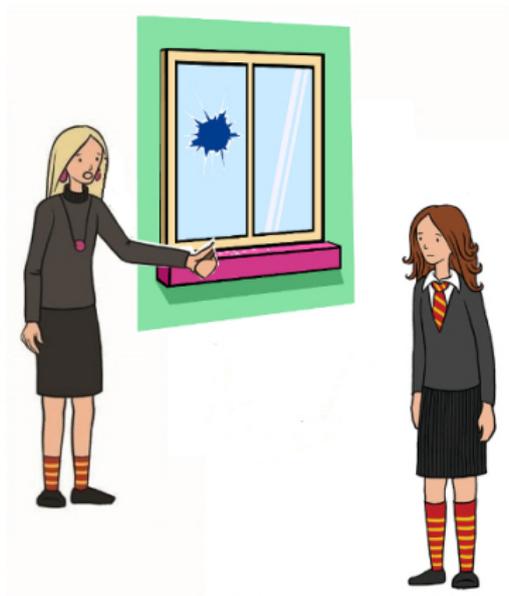


DISPLAY

# Exp1 — non-alternating verbs

DO: \**Luna is reporting Hermione the accident.*

PD: ✓ *Luna is reporting the accident to Hermione.*



REPORT

# Exp1 — picture-matching game

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- Confederates consistently used double object (DO) structures

# Exp1 — breaking down Speaker type

## ■ Pre-test survey:

Peninsular Spanish version of the LEAP-Q, which included self-assessments of their English proficiency (e.g. how often they are identified as a non-native speaker)

## ■ Post-test survey:

Participants indicated their agreement with statements about their similarity with the other speaker

- 1 *The other person was **easy to understand***
- 2 *The other person **sounded similar** to me*
- 3 *The other person and I have **similar backgrounds** (family, education, etc)*
- 4 *The other person and I have **similar interests***
- 5 *If we lived in the same place, the other person and I would be part of the **same friend group***
- 6 *The other person is a **native speaker of English***

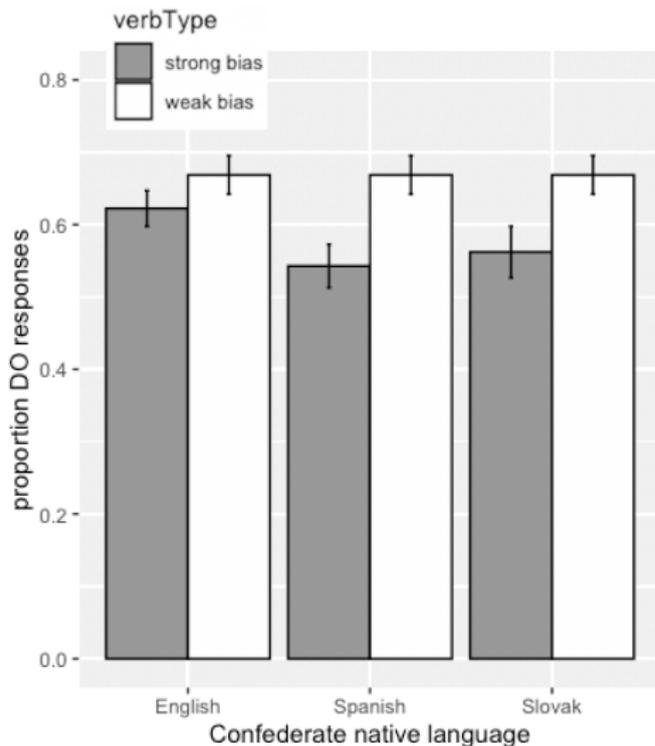
# Exp1 — results

- Responses were coded as DO (double object), PD (prepositional dative), or other
- Unaggregated responses were fitted with mixed-effects regression models predicting DO responses
  - Random intercepts and slopes included for Participant and Item
  - Fixed effects: Verb type (alternating, non-alternating)\*, Trial type (describe, respond), Trial order, Identifiability (LEAP-Q), Nativeness (post-test), Similar interests (post-test), two-way interactions
  - Fixed effects removed from model using stepwise model comparison if they did not improve model fit or were collinear with other model terms

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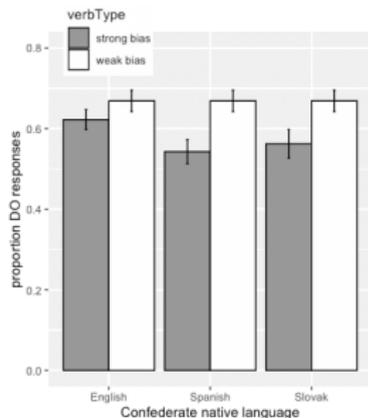
*\*PD-advantage from norming study: how biased is each verb toward a PD vs. a DO structure?*

# Exp1 — results



- **Alternating verbs** were more effective primes than non-alternating ones ( $\beta = -1.67$ ,  $SE = .49$ ,  $p < .001$ )
- More convergence with:
  - **Native** than non-native interlocutors ( $\beta = .45$ ,  $SE = .17$ ,  $p = .007$ )
  - **Similar interests** ( $\beta = .61$ ,  $SE = .18$ ,  $p < .001$ )

# Exp1 — results



- **Alternating verbs** were more effective primes than non-alternating ones
- More convergence with:
  - **Native** than non-native interlocutors
  - Interlocutors perceived to have **similar interests**

- **Verb type:Nativeness** interaction ( $\beta = .36$ ,  $SE = .17$ ,  $p = .03$ ):

As certainty that interlocutor is a native speaker increased, less penalty for using DO form with strongly PD-biased verbs

- **Verb type:Similar interests** ( $\beta = -.56$ ,  $SE = .26$ ,  $p = .03$ ):

As verbs became more strongly PD-biased, convergence boost associated with higher shared interests ratings weakened

- Native speaker status, perceived social proximity seem to independently affect convergence
- **Verb type:Nativeness:**

Anomalous DO sentences judged as **less ill-formed** when a confederate perceived as native-like says them — consistent with prior findings that nativeness mediates convergence
- **Verb type:Similar interests:**

Participants became **less willing to produce DO sentences** as they became increasingly anomalous

# Why say a sentence like *Ron announced Luna something?*

- To **communicate smoothly** (*'This will work better if I just say it like them even though it sounds weird to me'*)
- To sound as **native-like** as possible (*'My judgments about English syntax are dodgy, if that native speaker says it that way, it must be fine'*)

# Why say a sentence like *Ron announced Luna something?*

- To **communicate smoothly** (*'This will work better if I just say it like them even though it sounds weird to me'*)
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- ???

*'This person sounds kinda like me — if I say these sentences like she is, ...maybe she'll think I'm cool too' ??*

*'I think this person and I are similar kinds of people — they're saying some of these sentences kind of weirdly, but ...I kinda trust her! I'll give her the benefit of the doubt' ??*

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## Questions:

Are there even social proximity effects in the absence of native speaker differences?

Do interlocutors' perceptions of their social proximity shift as a result of playing this 45-minute game together?

- participants: **native BrE speakers**  
confederates: **South-East England, Cork Ireland**
- 

## ■ Pre-test

- *Verbal guise*: Listen to recording of speaker describing how to navigate from bus stop on campus to the lab. Based on that:
- **Inter-personal similarity questions**
- **Map distance** — mark on the map where you're from, your best guess of where the speaker is from.

## ■ Post-test

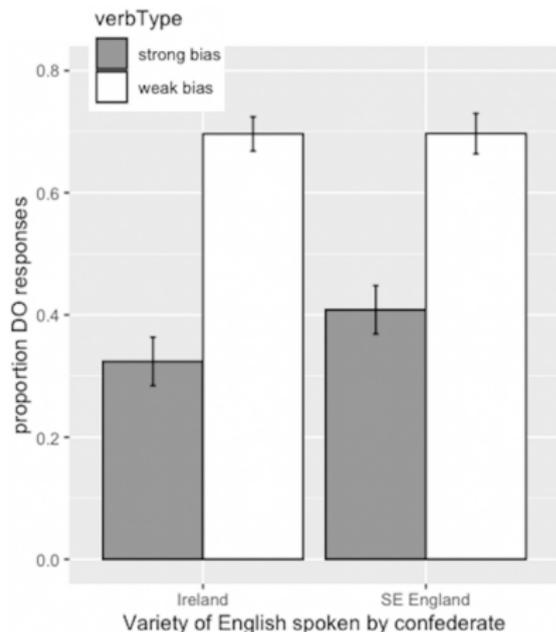
- **Inter-personal similarity questions**

- Unaggregated responses were fitted with mixed-effects regression models predicting DO responses
  - Random intercepts and slopes included for Participant and Item
  - Fixed effects: Verb type (alternating, non-alternating)\*, Trial type (describe, respond), Trial order, Map distance, Shared background, two-way interactions
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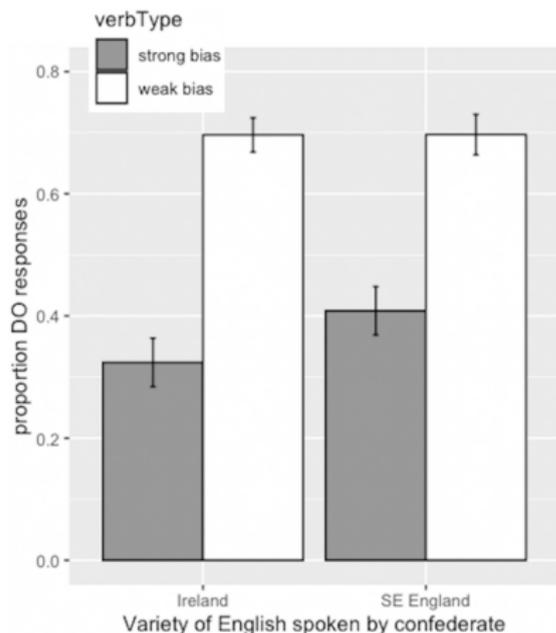
\**PD-advantage from norming study*

# Exp2 — results



- **Alternating verbs** were more effective primes than non-alternating ones ( $\beta = -7.64$ ,  $SE = 1.02$ ,  $p < .001$ )
- **Verb type:Map distance** interaction ( $\beta = .33$ ,  $SE = .17$ ,  $p < .001$ )  
Interlocutors perceived to have hometowns closer to the participant were penalised less for anomalous DO sentences

# Exp2 — results



- **Alternating verbs** were more effective primes than non-alternating ones ( $\beta = -7.64$ ,  $SE = 1.02$ ,  $p < .001$ )
- **Verb type:Map distance** interaction ( $\beta = .33$ ,  $SE = .17$ ,  $p < .001$ )  
Interlocutors perceived to have hometowns closer to the participant were penalised less for anomalous DO sentences

- **Marginal Verb type:Similar backgrounds** ( $\beta = .33$ ,  $SE = .17$ ,  $p = .05$ )

As perception of shared background increased, less penalty for anomalous DO sentences

# Exp2 — interpersonal similarity questions

- participants: **native BrE speakers**  
confederates: **South-east England, Cork Ireland**
- 

## ■ Pre-test

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## ■ Post-test

- **Inter-personal similarity questions**

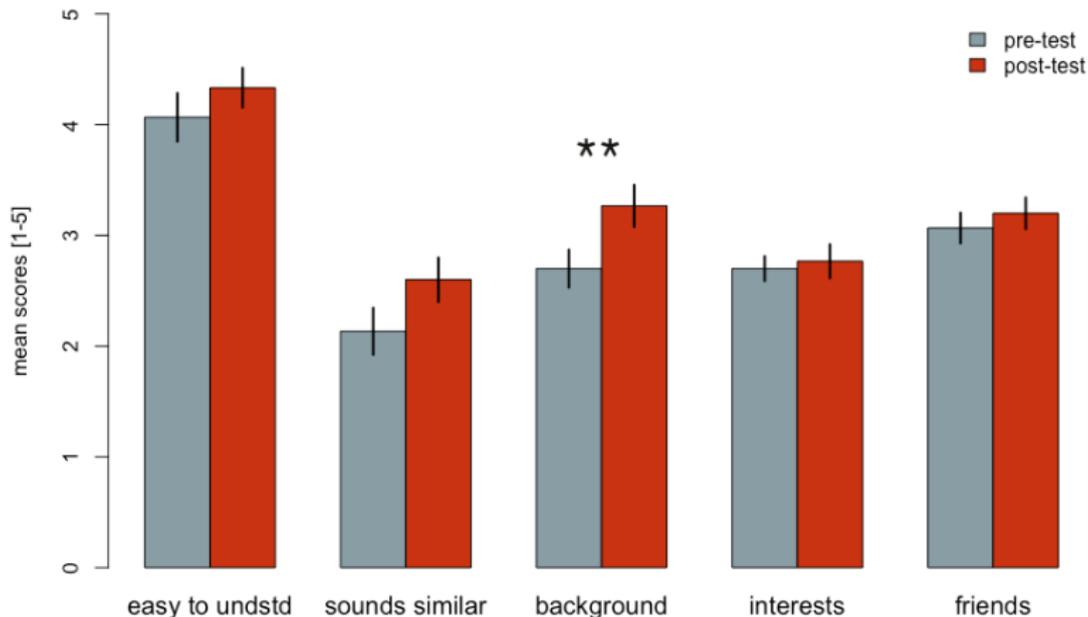
## Exp2 — interpersonal similarity questions

Participants indicated their agreement with statements about their similarity with the other speaker

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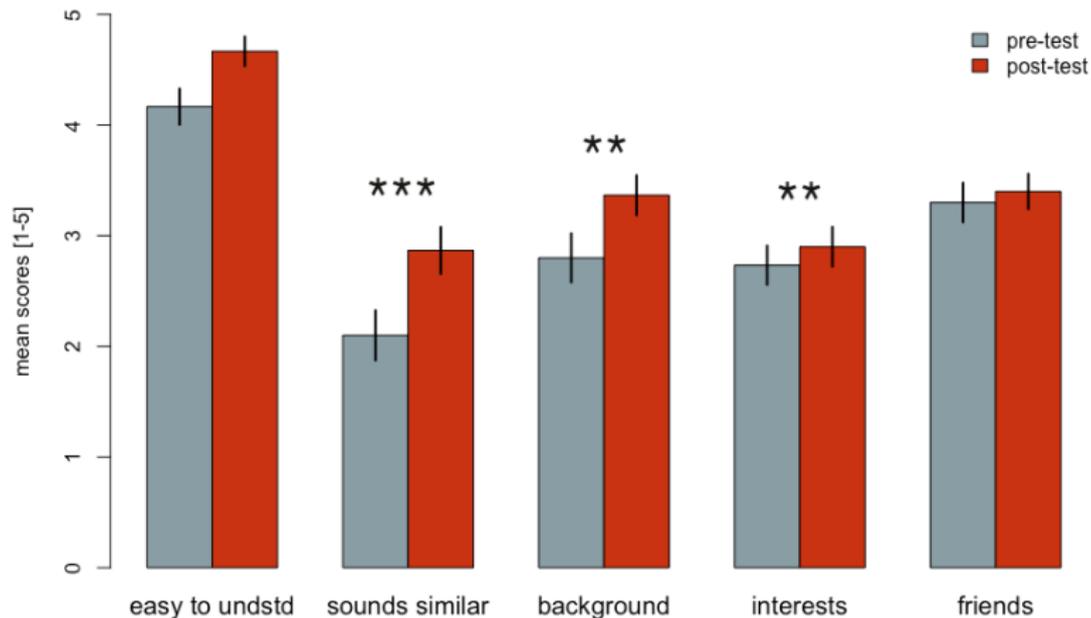
## Exp2 — pre-/post-test scores

Participants with **least increase** in convergence (first to last third of trials)



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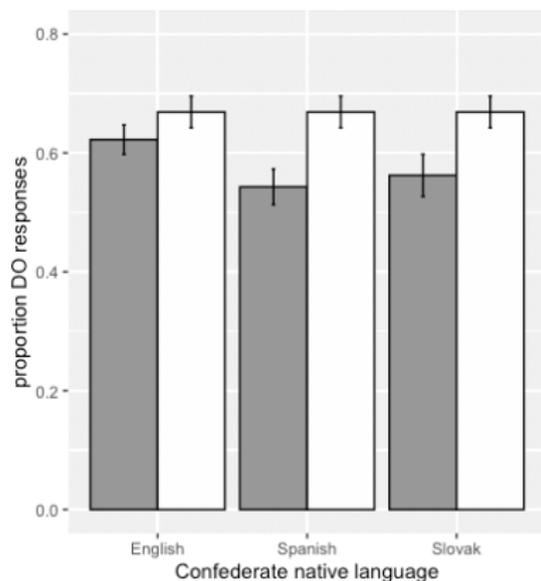
Participants with **greatest increase** in convergence (first to last third)



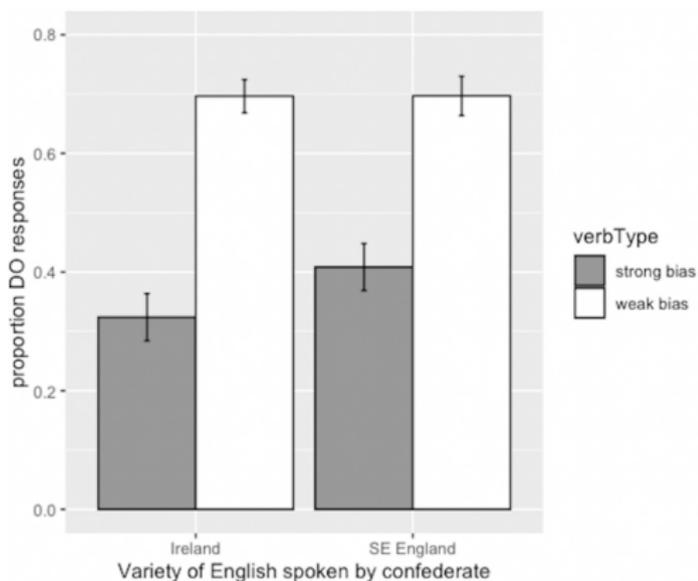
- Evidence for **social proximity effects in the absence of native speaker differences**/across regional varieties of British English
- Participants who showed greatest convergence with their interlocutors also show a greater breadth of **increase in measures of perceived inter-personal similarity**

# Native speaker status, certainty about grammaticality

## Exp1/L2 participants



## Exp2/L1 participants



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# Two independent drivers of structural convergence

- **Competence:** Listeners adapt more to speakers they perceived to have native competence — indicative of their level of certainty about acceptability of syntactic forms.

*Brehm, et al. (2018): ungrammaticality more likely to be interpreted as misperception for typical native speakers than for native speakers with atypical dialects or L2 speakers.*

# Two independent drivers of structural convergence

- **Competence:** Listeners adapt more to speakers they perceived to have native competence — indicative of their level of certainty about acceptability of syntactic forms.
- **Social proximity:** Listeners adapt more to speakers they perceived to be socially similar to themselves, as indicated by the accent associated with their dialect, non-native status.

*Babel (2010): At least phonetic alignment is sensitive to social signalling pressures. Also: Familiar-sounding speakers are socially preferred (Babel & McGuire 2015).*

*Cf. Branigan et al. (2011): Socially-mediated convergence need not involve high-level reasoning (but of course, it might).*

## Some questions

- Finer-grained ways of measuring perceived inter-personal distance — including **implicit measures** (e.g. Babel's use of cross-cultural version of IAT, other measures that don't rely on sociolinguistic cues)
- **Divergence** expected if there is a salient social reason to maintain distance
- Does structural convergence happen because it's part of general convergence with a speaker? Or are there reasons to think phonetic accommodation, lexical entrainment are distinct processes, despite similarities?

# Thanks!

RAs: Beth Waldock, Lara Baker-Harrison, Miracle Ashu, Eszter Farkas,  
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