The role of grammatical alignment, engagement, and exposure in cross-dialectal influence on bilectal processing

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9th February 2023

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Handout – tinyurl.com/MultilectalMinds

Cross-dialectal influence on bilectal processing:
Evidence from Norwegian ERPs

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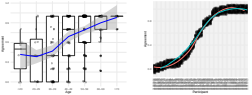

(a) Agreement by age (N = 197, mean = 0.711, SD = 0.454)

(b) Agreement by individuals (N = 73, mean = 0.736, SD = 0.440)

Figure 6: Variation in number agreement on predicate participles in Sunnmøre

3.2.2 ERP results

Condition 1 – gender agreement in Bokmål (control)

As expected, Northern Norwegians and Sunnmøringar display robust P600 effects of gender agreement in Bokmål (Figur 7)

- increased positive amplitude which starts around 600 ms for sentences without gender agreement

☞ a common grammatical feature for all three varieties, no cross-dialectal influence

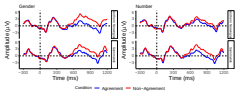

Figure 7: ERP waveforms recorded at electrode Pz for gender and number agreement among Northern Norwegian and Sunnmørsk participants while they read sentences with agreement (blue) and without agreement (red) in Bokmål. Northern Norwegians display significantly attenuated amplitude differences between non-/agreement trials in number vs. gender conditions.

Background

Bilectalism and bilectal processing

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Bilectalism:

A context where individuals – bilectals – acquire two (vernacular) varieties (e.g. Northern and Western Norwegian) and/or one or more written varieties of the same language (e.g. Norway's two official written languages Nynorsk and Bokmål)

Main questions and main findings

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- how do conflicting (misaligned) grammatical features interact in bilectal processing?
- how is the processing of written languages (e.g. Bokmål) influenced by one's dialect?

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- conflicting/misaligned grammatical features interact in bilectal processing
  (Cross-Dialectal Influence on Bilectal Processing)
- effects of bilectal misalignment may be modulated by linguistic engagement/exposure
  (Linguistic Experience Modulates Bilectal Processing)

Bilectal grammatical variation

Bilectalism and language processing

Bilectalism and language processing

(1) **Number agreement in Northern Norwegian, Sunnmørsk, and Bokmål**

bilan	e	rød/*rød-e	**Northern Norwegian**
bilane	e	*raud/raud-e	**Sunnmørsk**
bilene	er	*rød/rød-e	**Bokmål**

Methods – electroencephalography (EEG) and the ERP-technique

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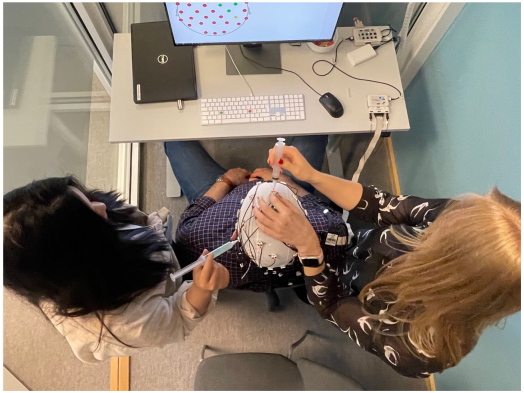
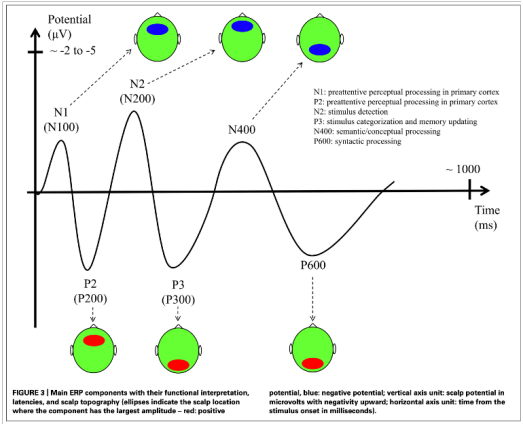


(a) A Northern Norwegian participant during experimental preparation



(b) Main ERP-components and their functional interpretations

Figure 2: EEG-measurement and event-related potentials (ERPs)

Event-related potentials (ERPs)

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In this study, we analyse how the brain responds to different grammatical inputs by use of Event-Related Potentials (ERPs)

Event-related potentials (ERPs):

The measured brain response to a specific sensory, cognitive, or motor event

- e.g. how the brain responds to a specific (in/correctly inflected) word in a sentence

Time-locking ERPs

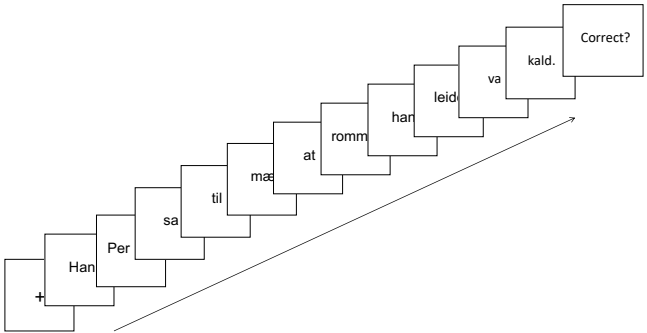

Figure 3: Sentences are presented word for word (Rapid Serial Visual Presentation)

The P600-effect and Norwegian adjective inflection

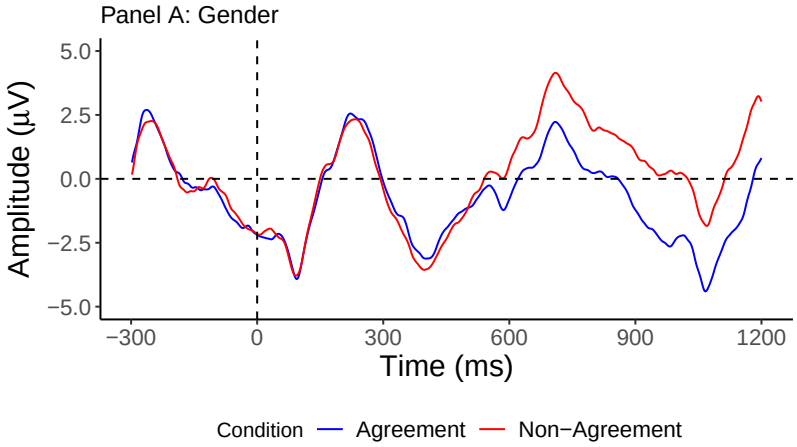

Figure 4: ERP-waveforms, recorded at electrode Pz (midline posterior) from participants while reading sentences with agreement (blue) and without agreement (red) in Northern Norwegian dialect writing

The experiments – bilectal processing in Northern Norway and Sunnmøre

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This project consists of three experiments

- Experiment 1 processing of Northern Norwegian dialect by Norwegians in Tromsø
- Experiment 2 Bokmål-processing by Northern Norwegians in Tromsø
- Experiment 3 Bokmål-processing by Sunnmøre dialect speakers in Volda

Experiment 1 – dialect exposure modulates processing of dialect-specific features

Condition 1 – number agreement on predicate adjectives

Predicate adjectives do *not* display overt agreement in Northern Norwegian dialects

- the grammatical form is a bare stem, without inflection
- the opposite pattern of what we find in most other dialects; e.g. Bokmål in (3)

(2) **NNorwegian** Han Tor viste mæ at eplan han kasta va full/*fulle av mark
'Tor showed me that the apples he threw out were full-∅/*-PL of worms'

(3) **Bokmål** Tor viste meg at eplene han kastet var fulle/*full av mark
'Tor showed me that the apples he threw out were full-PL/*-∅ of worms'

Condition 2 – gender agreement on predicate adjectives

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As a control, gender agreement on predicate adjectives was also tested (4). Gender agreement is a grammatical feature which is common to all Norwegian dialects and therewith expected to be processed similarly regardless of exposure to Northern Norwegian dialects

(4) **NNorwegian** Ho Liv fortalte mæ at hunden ho trænte va snill/*snilt mot unga
'Liv told me that the dog-M she trained was nice-M/*-N towards kids'

Research questions

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- How do Northern Norwegians and non-northern Norwegians process gender and number agreement in Northern Norwegian dialect writing?

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1. How do Northern Norwegians and non-northern Norwegians process gender and number agreement in Northern Norwegian dialect writing?
2. To what extent are potential individual differences modulated by one's first language and/or exposure to Northern Norwegian dialects?

ERP aggregate results

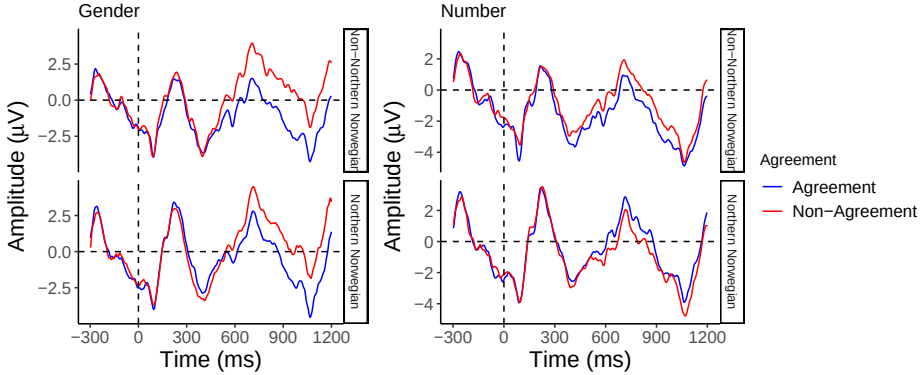

Figure 5: ERP waveforms recorded at electrode Pz for gender and number non-/agreement among Northern Norwegian and Non-Northern Norwegians while reading sentences with agreement (blue) and non-agreement (red) in Northern Norwegian dialect writing

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- do bilectals adjust their processing to other Norwegian dialects/varieties?
  - e.g. do their brain responses differ when processing obligatory number agreement in Bokmål?

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In Norway, we have multiple Norwegian written languages (Nynorsk/Bokmål), and these have varying grammatical alignment with Norwegian dialects

- to what extent is processing of Norwegian written languages (i.e. Nynorsk/Bokmål) influenced by grammatical mis/alignment in Norwegian dialects?

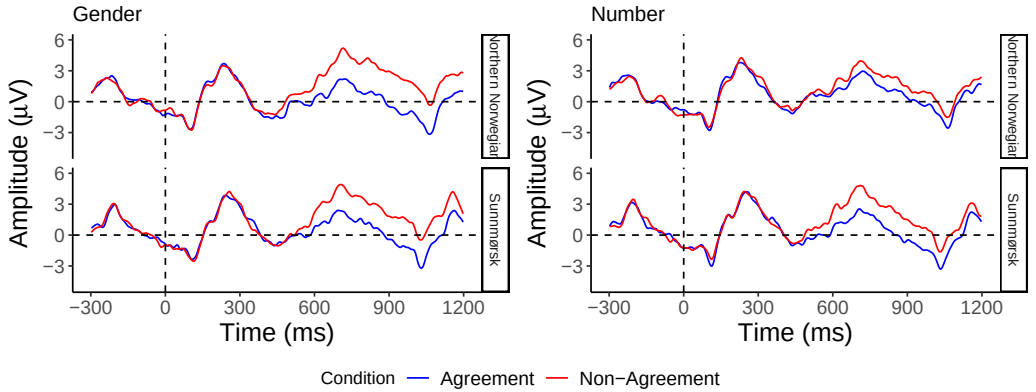
Experiments 2 & 3 – cross-dialectal influence on bilectal processing

Conditions – aligned and misaligned grammatical features

Condition	Agreement	Example	Bokmål	NNorw	Sunnmørsk
Adj.gen	agreement	*eleven er frekk*	✓	✓	✓
	non-agreement	*eleven er frekt*	×	×	×
Adj.num	agreement	*husene er fine*	✓	×	✓
	non-agreement	*husene er fin*	×	✓	×
Part.num	agreement	*lyktene er tente*	×	×	(✓)
	non-agreement	*lyktene er tent*	✓	✓	(×)

Table 1: Conditions – common gender agreement, unique number non-agreement in NNorw, and unique participial number agreement in Sunnmørsk

ERP results: gender (control) and number (target)



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Cross-dialectal influence and behavioural responses

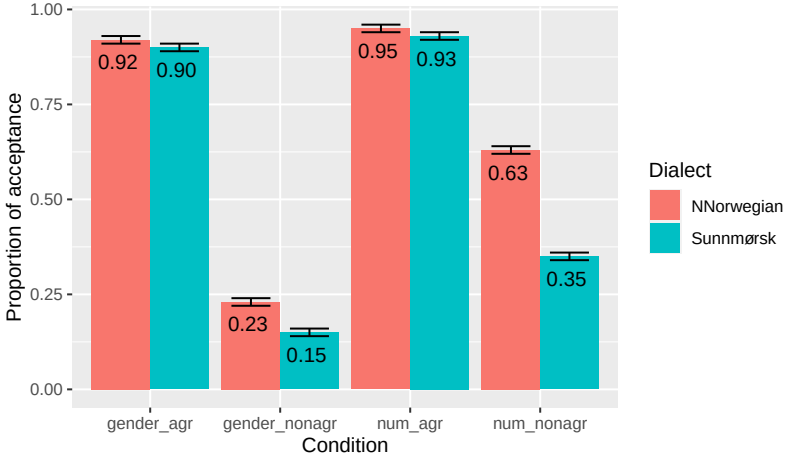

Figure 7: Significant effect of *Group* (Northern Norwegian, Sunnmørsk) on acceptance of number non-agreement in Bokmål

Bokmål reading processing and Bokmål engagement/exposure

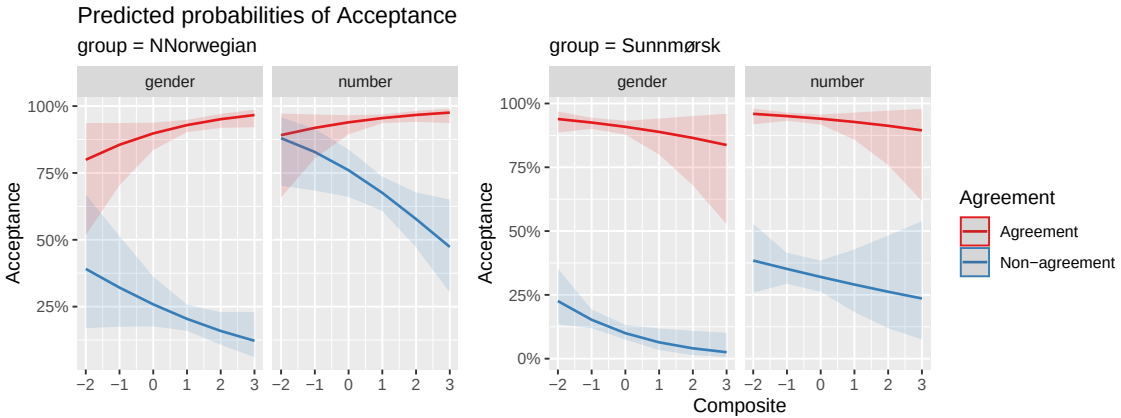

Figure 8: Predicted values illustrating the interaction between *group* (NNorwegian, Sunnmørsk) × *Condition* (gender, number) × *Agreement* (Agreement, non-agreement) × *Composite* (Bokmål engagement/exposure) on grammaticality judgements (*Acceptance)*

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  - ☞ misaligned grammatical features interact in bilectal processing (Cross-dialectal Influence on Bilectal Processing)
- Northern Norwegian participants' grammaticality judgments are modulated by Bokmål engagement/exposure
  - ☞ Effects of grammatical alignment are modulated by bilectal experience (Cross-Dialectal Influence Varies by Bilectal Experience)

Takk for merksemda dykkar!