Syntactic Alignment and the Mediating Role of Social Perception and Higher-order Social Cognition

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1. Overview

Syntactic alignment is the reuse of a recently experienced sentence structure.

Psycholinguistic accounts view alignment as the result of automatic cognitive mechanisms that operate to facilitate processing and communication.

Sociolinguistic work has focused on the role of **social identity and interactional strategy** in explaining linguistic alignment.

We integrate these two traditions to investigate how social perception and cognition influence the mechanisms involved in alignment.

We focus on the English dative, and we used **a novel web-based paradigm** to collect speech data from a large socially heterogeneous sample.

Our results suggest **automatic but socially-mediated syntactic alignment**.

English Dative

Prepositional Object (PO) dative:
The waitress is giving a banana to the monk.

Double Object (DO) dative:
The waitress is giving the monk a banana.

2. Method

- Three-phase cumulative syntactic priming paradigm implemented on Amazon's Mechanical Turk.
- 340 participants total
- 301 participants after exclusions

Phase 1: Priming

Instructions: *Listen to the passage and form an impression of the talker. You will evaluate her later.*

Stimuli: 12 one-minute politically-charged diatribes spoken by females with different accents. Each contained 10 datives.

- 2 dative structures (DO vs. PO)
- 2 political ideologies (liberal vs. conservative)
- 3 accents (standard-sounding White English, standard-sounding Black English, non-native Mandarin accent)

Priming Conditions: each subject heard one of the 12 diatribes or received no priming (baseline condition)

Table 1. Example DO and PO dative sentence from the prime passage.

Ideology	Dative	Example Sentence
Conservative	PO	Congress is just throwing money to welfare moochers.
	DO	Congress is just throwing welfare moochers money.
Liberal	PO	Congress is just throwing money to corporate executives.
	DO	Congress is just throwing corporate executives money.

Phase 2: Picture Description

Instructions: *Please describe each picture in a single sentence. Avoid using pronouns.*

Stimuli: 10 pictures – 4 targets, 6 fillers

- Target pictures convey transfer action to evoke a dative production in the description. These datives are used to assess alignment relative to the priming passage condition.

Example target.

Example filler.

Phase 3: Four-part Social Perception Survey (36 Likert-style Qs)

(i) Social evaluation of prime speaker, E.g.,
- *The speaker was easy to understand.*
- *The speaker sounded generous.*

(ii) Participants self-reported ideologies, E.g.,
- *My political views are usually conservative.*
- *It bothers me when one doesn't speak English properly.*

(iii) Perceived similarity to prime speaker, E.g.,
- *I agree with the speaker's arguments.*
- *I would want the speaker as a friend.*

(iv) Preferred conflict management style, E.g.,
- *I try to meet the other person half way.*
- *I pretend as if the conflict isn't happening.*

3. Survey Analysis

Survey responses analyzed with factor analysis (FA) to reduce data to principal dimensions, which were then test as predictors of alignment.

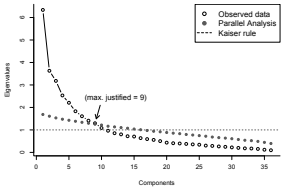

Figure 1. Scree plot showing the maximum number of factors justified for factor analysis according to the **parallel analysis** and the **Kaiser criterion**.

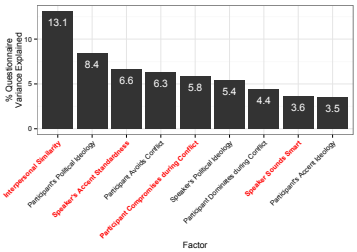

Figure 2. Percent of survey response variance explained by each of the 9 factors returned by factor analysis. Factors in red turned out to be significant predictors of alignment.

4. Results

Manipulation Checks:
Factor scores from factor analysis of the social perception data were compared against design manipulations.

Accent Manipulation (Fig 3.)
- The White English prime speaker was rated more standard sounding than the Black English speaker (β = .48, p < .001)
- The non-native speaker was rated less standard than the Black Eng speaker (β = -1.4, p < .001)

Political Manipulation (Fig 4.)
- Prime speaker rated more liberal following the liberal passage (β = 1.3, p < .001)

Perceived Interpersonal Similarity (Fig 5.)
- Similarity ratings were predicted by an interaction between participant's political ideology and that of the prime speaker (β = -0.9, p < .001)

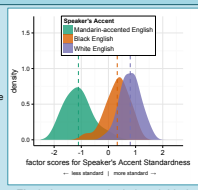

Fig 3. Accent manipulation yielded sig. 3-way rating distinction for "accent standardness".

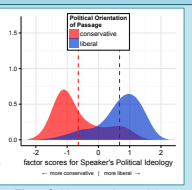

Fig 4. Subjs correctly rated the prime speaker's political ideology (which indicates they attended to the content of the passage).

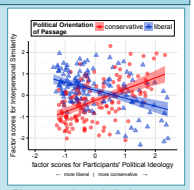

Fig 5. perceived similarity was greatest when subj's political ideology matched that of the prime speaker.

Alignment Analysis:
- Response syntax coded as matching (1) or mismatching (0) the dative structure heard during priming phase
- **Fixed effects** in mixed logit model: the 9 social factors from factor analysis, prime syntax, and all two-way interactions between prime syntax and social factors
- **Significant alignment overall** (see Fig. 6) – greater PO use following PO exposure (β = 0.9, p < .001)
- **Likelihood of alignment was mediated by several social factors**:
  - greater alignment when the prime speaker had a standard-sounding accent (β = 0.35, p < .05) – see Fig 7.
  - greater alignment among subjs who prefer to compromise during conflict (β = 0.35, p < .05) – see Fig 7.
  - significant interaction btw interpersonal similarity factor and prime syntax (β = -0.37, p < .05) – see Fig 8.
  - significant interaction btw speaker sounds smart factor and prime syntax (β = 0.41, p < .05) – see Fig 8.

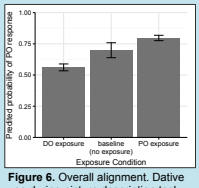

Figure 6. Overall alignment. Dative use during picture description task.

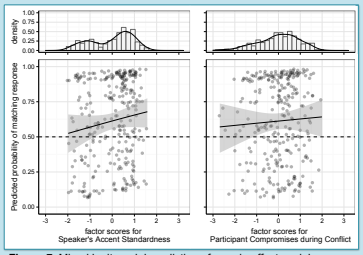

Figure 7. Mixed logit model predictions for main effect social modulations. Dashed lines indicate chance level of alignment.

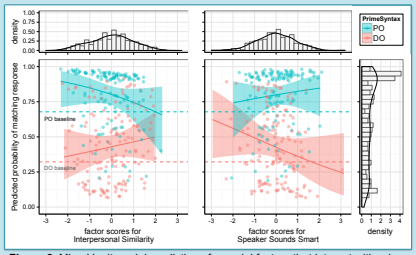

Figure 8. Mixed logit model predictions for social factors that interact with prime syntax. Dashed lines mark baseline DO/PO rates from the no priming condition

5. Conclusions

- Novel paradigm replicated basic alignment effects, indicating the viability of online paradigms for studying speech production.
- Alignment is a basic phenomenon that occurs in response to recent exposure: i.e., the observed effect of alignment across all social conditions (see Fig. 6), and the lack of any evidence for anti-alignment (see Figs. 7 & 8).
- However, the *degree* of alignment depends on participants' perceptions of others (e.g., interpersonal similarity, accent standardness) and participants' individual tendencies (e.g., higher-order social cognition concerning conflict management).
- The same social factors may yield different alignment behaviors depending on the experienced linguistic structure (see Fig. 8). Further research is needed to understand the mechanisms underlying such differences.
- Attention *might* be responsible for (some of) the social modulations. E.g., "compromisers" may attend more to information they disagree with than non-compromisers, and greater attention to the priming passage could explain greater alignment.
- **Draft manuscript** available at: http://www.academia.edu/6274201/Weatherholtz_K._Campell-Kibler_K._and_Jaeger_T._F._submitted._Socially-mediated_syntactic_alignment

Web-based speech recording

With the help of Ian McGraw's (MIT Media Lab) WAMI, Andrew Watts (HLP lab) developed a paradigm for conducting experiments on **spoken language production over the web**.

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