Look before you leap: Careful incremental processing of idiosyncratic grammaticalised partial-agreement: ERPs and self-paced reading evidence from Arabic

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Introduction

Singular-subject—verb agreement in Modern Standard Arabic:
- SV order: FULL. I.e., Person, Gender, Number; N = singular
- VS order: FULL. P, G, N = singular

Plural-subject—verb agreement:
- SV order: FULL. P, G, N = plural
- VS order: idiomsyncretic
  - PARTIAL, if subject is overt. I.e., P, G, N = singular (*plural)
  - FULL, if subject is dropped. I.e., P, G, N = plural (*singular)

In the current set of studies, we employed verb-initial intransitive structures to investigate whether & in what manner the processing system is sensitive to this idiosyncrasy of plural subjects in Arabic.

ERPs study: Hypotheses
- No ERP difference at the sentence-initial verb
- Qualitatively different ERPs for singular versus plural subjects
- If an initial non-anomalous reading adopted for plurals, effects of the perception of anomaly must be observed at the position of the following material that conclusively signifies the anomaly.

Self-paced reading study: Word-by-word acceptability judgement
- To provide behavioural evidence to the ERP data at each position.

Methods

ERPs study:
- Participants: 34 right-handed native speakers of Arabic
- EEG Data recording at 25 Ag / AgCl scalp electrode sites
- Reference: Left-mastoid, re-referenced to linked mastoids offline
- Ground electrode: AFZ. Oﬄine ﬁlter: 0.3 – 20 Hz band-pass
- Rapid serial visual presentation of stimuli
- Tasks: Acceptability judgement followed by Probe detection
- Sentences of the form: Verb – Subject – Adverb of time – PP.
- Adverb was identical (‘Yesterday’) in all sentences
- Subject noun: masculine / feminine animate common noun
- 4 Critical Conditions (36 sentences in each condition per participant)
  - 2 Condition-Types: Singular-marked Verb or Plural-marked Verb
  - 2 Subject-Types: Singular or Plural

Self-paced reading study: word-by-word acceptability judgements
- Participants: 50 native speakers of Arabic
- Stimuli: 4-word structures; adverb ‘yesterday’ in different positions

Results

ERPs results:
- At the Verb: No effects.
- At the Subject:
  - Negativity for singular nouns—both condition-types
  - Early Positivity for PVPS as opposed to PVSS
  - Late Positivity for all conditions except SVSS
- At the Adverb: Negativity for violation conditions

Self-paced reading results: Word-by-word acceptability ratings show:
- Significant drop in acceptability for the PVSS condition at position 3
  - ERP effects at the adverb not due to word-type.
- Sentence-final acceptability closely mirrors that from the ERP study
  - PVPS condition quasi-violation, but still acceptable.

Discussion

- Late-positivity for plural subjects can be plausibly interpreted as resulting from syntactic integration diﬃculty (Kaan et al., 2000) and the prediction the processing system must make about the forthcoming material (Frisch et al., 2002).
- At the subject following a sentence-initial plural verb, the processing system initially adopts a wait-and-see policy until further evidence for an anomaly arrives, evoking a negativity. Behaviourally though, the sentence may still be acceptable.
- These results suggest that the processing system is sensitive to the idiosyncrasy of plural subjects in Arabic, and prefers to analyse them at first as syntactically diﬃcult but nevertheless not conclusively anomalous in intransitive verb-initial structures. Although a violation grammatically, the PVPS structure remains relatively acceptable, possibly due to glossia and vast variation in spoken dialects of Arabic. This needs to be examined further in a sentence completion study.

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