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# Syntactic and Semantic Mismatches in English Number Agreement

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# Background: Collective Nouns

- Collective nouns (e.g. *family*, *committee*, *class*) can be interpreted as a **group** of individuals
- In English, they can trigger either singular (“syntactic”) or plural (“semantic”) agreement

## Subject-Verb agreement

- The government **has** been criticized.
- The government **have** been criticized.

## Anaphor-antecedent agreement

- The government offered **itself** up for criticism.
- The government offered **themselves** up for criticism.

# Background

Agreement hierarchy (Corbett, 1979)



<b>Determiner-noun</b>	<b>Verb-subject</b>	<b>Anaphor-antecedent</b>
This committee	The committee is	The committee .... itself
*These committee	The committee are	The committee.... themselves

# The double mismatch effect

## Acceptability asymmetry in mismatching agreement (Smith, 2017)

- The government **has** offered **itself** up for criticism.
- The government **have** offered **themselves** up for criticism.
- ?The government **has** offered **themselves** up for criticism.
- \*The government **have** offered **itself** up for criticism.

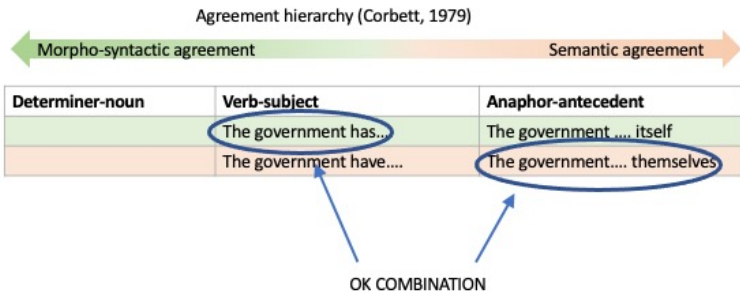
## Intuitively “marginal”: (Example c)

- Syntactic (singular) agreement for verb
- Semantic (plural) agreement for anaphor

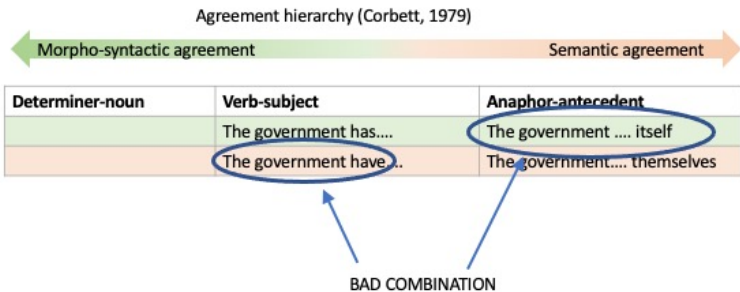
## Intuitively “ungrammatical”: (Example d)

- Semantic (plural) agreement for verb
- Syntactic (singular) agreement for anaphor

# Explanations of the double mismatch effect



# Explanations of the double mismatch effect



# Explanation for double mismatch effect?

## Based on hierarchy?

*“In addition to the sentences where the agreements match, we also expect that a mismatch between the two targets can arise if it is the element to the right on the hierarchy that shows semantic agreement, and the element to the left that shows morphological agreement.” (Smith, 2015)*

## Based on distance?

*“We predict that any such constraint will take the form of disallowing a combination of semantic agreement of the nearer element and syntactic agreement of the further” (Corbett, 1979)*



# Experiment 1

Aim to provide experimental test of the double mismatch acceptability pattern.

Singular reflexive: singular(match)/plural(mismatch)/neutral verb

The government **has** / **have** /had distanced **itself** from the scandal.

Plural reflexive: singular(match)/plural(mismatch)/neutral verb

The government **have** / **has** /had distanced **themselves** from the scandal.

- 72 British English participants (Prolific); 36 items
- Acceptability rating on 1-7 scale (PClbex)
- Bayesian ordinal logistic mixed effect regression (brms)

# Experiment 1

Aim to provide experimental test of the double mismatch acceptability pattern.

Singular reflexive: singular(match)/plural(mismatch)/neutral verb

The government **has** / **have** /had distanced **itself** from the scandal.

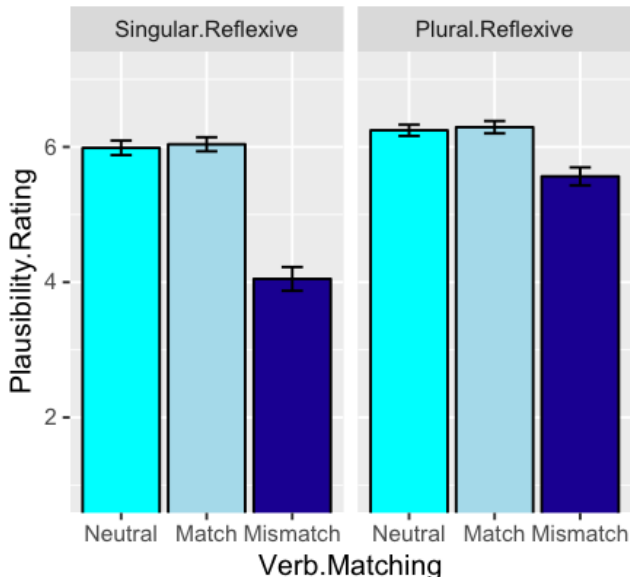
Plural reflexive: singular(match)/plural(mismatch)/neutral verb

The government **have** / **has** /had distanced **themselves** from the scandal.

Prediction:

Relative acceptability of mismatch will be better for plural reflexive than singular reflexive

## Figure 1 (Exp1)



# Summary of Experiment 1

- Experimentally confirmed the “double mismatch” pattern of acceptability
- singular verb + plural reflexive is more acceptable than reverse configuration
- Compatible with agreement-hierarchy based explanation:
  - Agreement mismatch is more acceptable when the more syntactic-oriented dependency shows syntactic agreement, and the more semantic-oriented dependency shows semantic agreement.
- But, also compatible with linear-distance based explanation:
  - Agreement mismatch is more acceptable when the nearer element shows syntactic agreement, and the more distant element shows semantic agreement.

# Experiment 2

Reverse order of verb and reflexive (relative to Experiment 1)

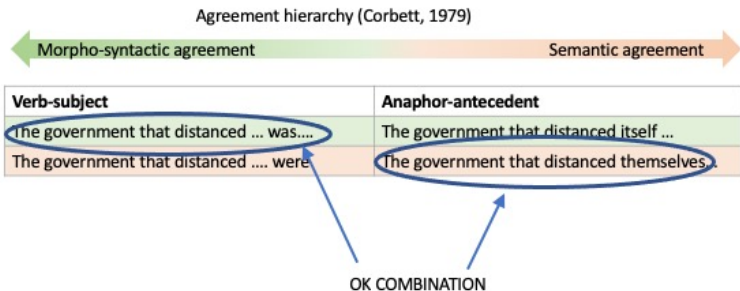
Singular reflexive; singular(match)/plural(mismatch) verb

The government that distanced **itself** from the scandal  
**was** / **were** discussed on the news.

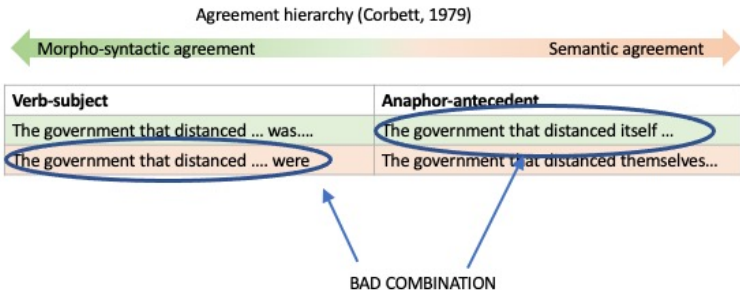
Plural reflexive: singular(mismatch)/plural(match)

The government that distanced **themselves** from the scandal  
**was** / **were** discussed on the news.

# Agreement hierarchy-based prediction (Exp2)



# Agreement hierarchy-based prediction (Exp2)



### Relative clause conditions

The government that distanced itself ... was discussed ...

### Coordination conditions

The government distanced itself ... and was discussed ...

- Relative number  $\times$  Verb matching  $\times$  Structure (RC vs. coordination)
- 72 British English participants (Prolific)
- 40 items
- Acceptability judgement (1-7 scale)
- Bayesian ordinal logistic mixed effect regression (brms)



## Experiment 2

Singular reflexive; singular(match)/plural(mismatch) verb

The government that distanced **itself** from the scandal  
**was** / **were** discussed on the news.

Plural reflexive: singular(mismatch)/plural(match)

The government that distanced **themselves** from the scandal  
**was** / **were** discussed on the news.

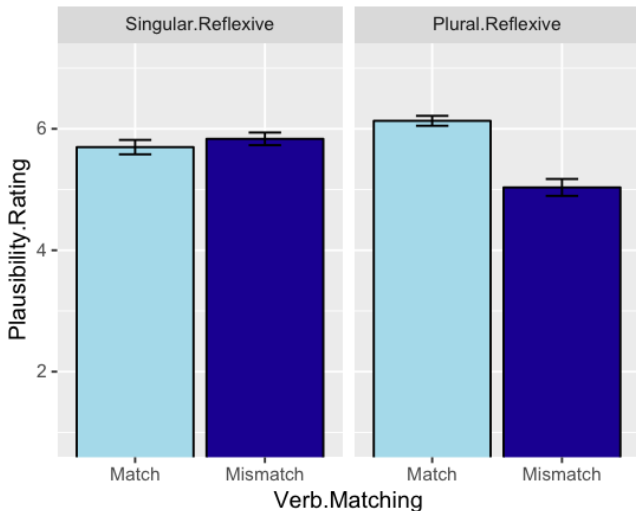
Hierarchy-based Prediction:

Relative acceptability of mismatch will be better for plural reflexive than singular reflexive

Distance-based Prediction:

Relative acceptability of mismatch will be better for singular reflexive than plural reflexive

# Experiment 2 results (collapsed over structure)



## Summary of Experiment 2


- Acceptability was degraded when the first element (reflexive) showed plural agreement, while the second element (verb) showed singular agreement.
- Suggests a role for incremental processing in explaining the “double mismatch” effect.

# Incremental processing-based explanation (Exp 1)

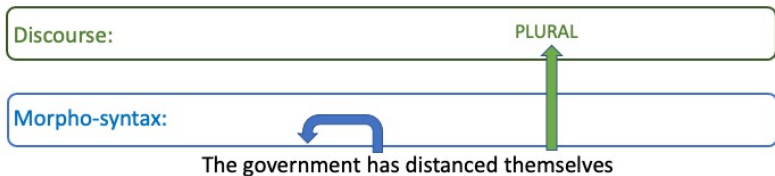
Discourse:

Morpho-syntax:

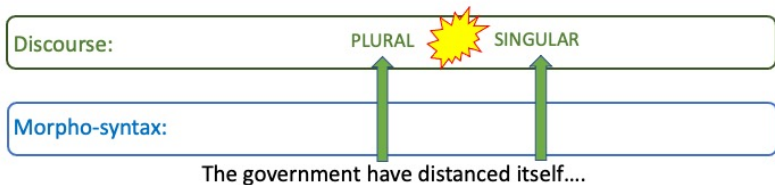
The government has



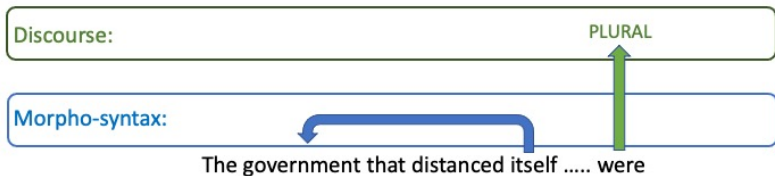
# Incremental processing-based explanation (Exp 1)



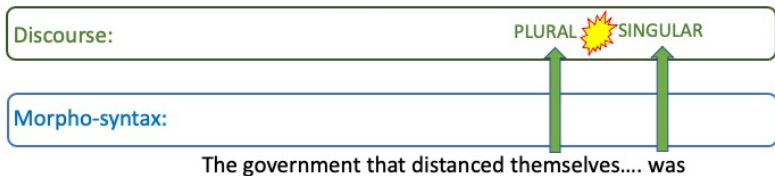
# Incremental processing-based explanation (Exp 1)



# Incremental processing-based explanation (Exp2)



# Incremental processing-based explanation (Exp2)





- **Experiment 1:** Experimental support for the “double mismatch” effect.
  - Compatible with either the distance-based or hierarchy-based account
- **Experiment 2:** Pattern of acceptability matches Exp1. in terms of distance, but not in terms of hierarchy.
  - Suggests a role for incremental processing in explaining the double mismatch effect
  - However, agreement hierarchy probably also plays a role)