Does word order predict redundant modifier production? A crosslinguistic perspective

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Outline

1. Word order effect on redundant modifier production
2. Experiments from Chinese, English, French and Spanish speakers
3. Results
4. Corpus study on adjective frequency
5. Conclusion & Discussion

Word order effect on redundant modifier production

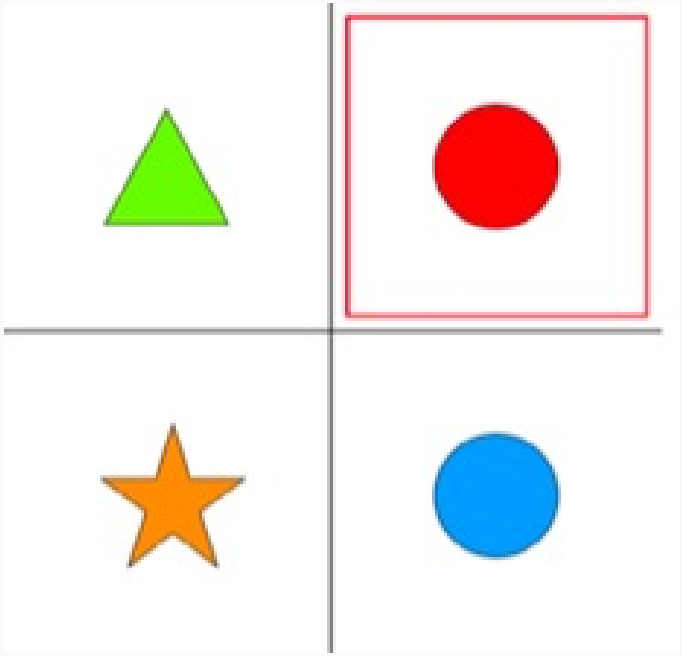
Maxim of quantity (Grice, 1975; Olson, 1970)

1. Be as informative as you can: giving enough information in communication

2. Give no more information than what is necessary: avoiding redundancy in communication

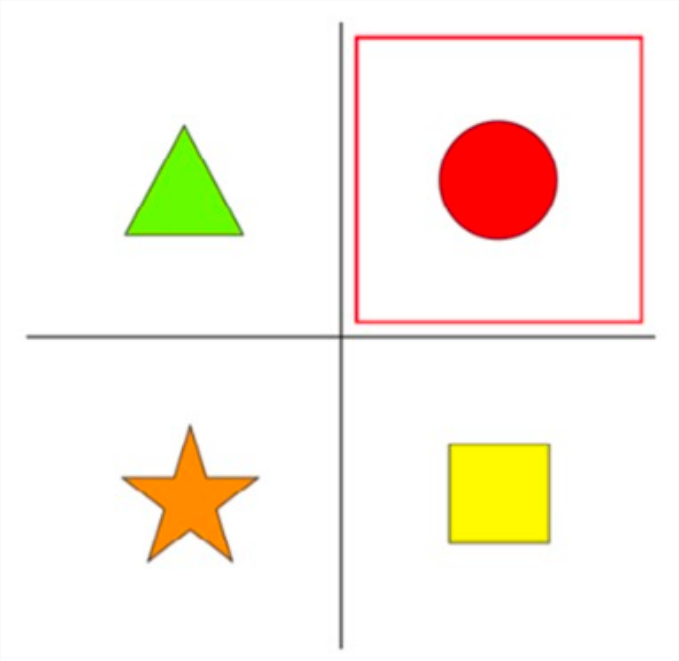
Contrastive use of color adjectives (following gricean principle)

When speakers are asked to identify an object among other objects containing the same shape but with different colors, they often produce informative color modifiers : the red circle (vs. the blue circle)



Redundant use of color adjectives (contra gricean principle)

- When speakers are asked to identify an object with unique shapes and colors among other objects, they often produce redundant color modifiers : the red circle



(Arts et al., 2011; Brown-Schmidt and Konopka, 2011; Rubio-Fernandez, 2019; Rubio-Fernandez and Jara-Ettinger, 2020; Rubio-Fernandez et al., 2021; Rubio-Fernández, 2016; Waldon and Degen, 2021; Wu and Gibson, 2021)

Crosslinguistic difference in redundant color production

- **Redundant color modifier production: EG > SP**
  (Rubio-Fernandez et al., 2021; Rubio-Fernández, 2016; Waldon and Degen, 2021; Wu and Gibson, 2021)

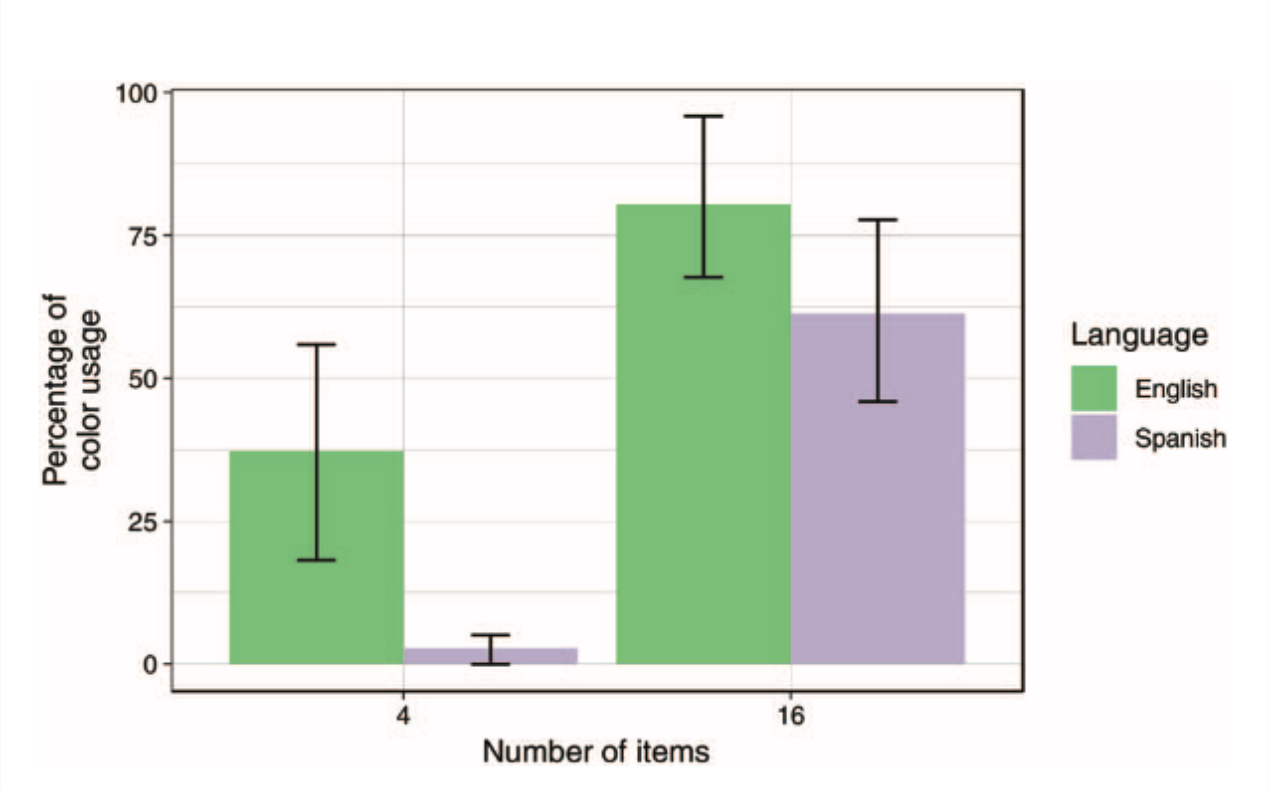


Figure 1: Rubio-Fernandez et al., 2021

Wu & Gibson (2021)

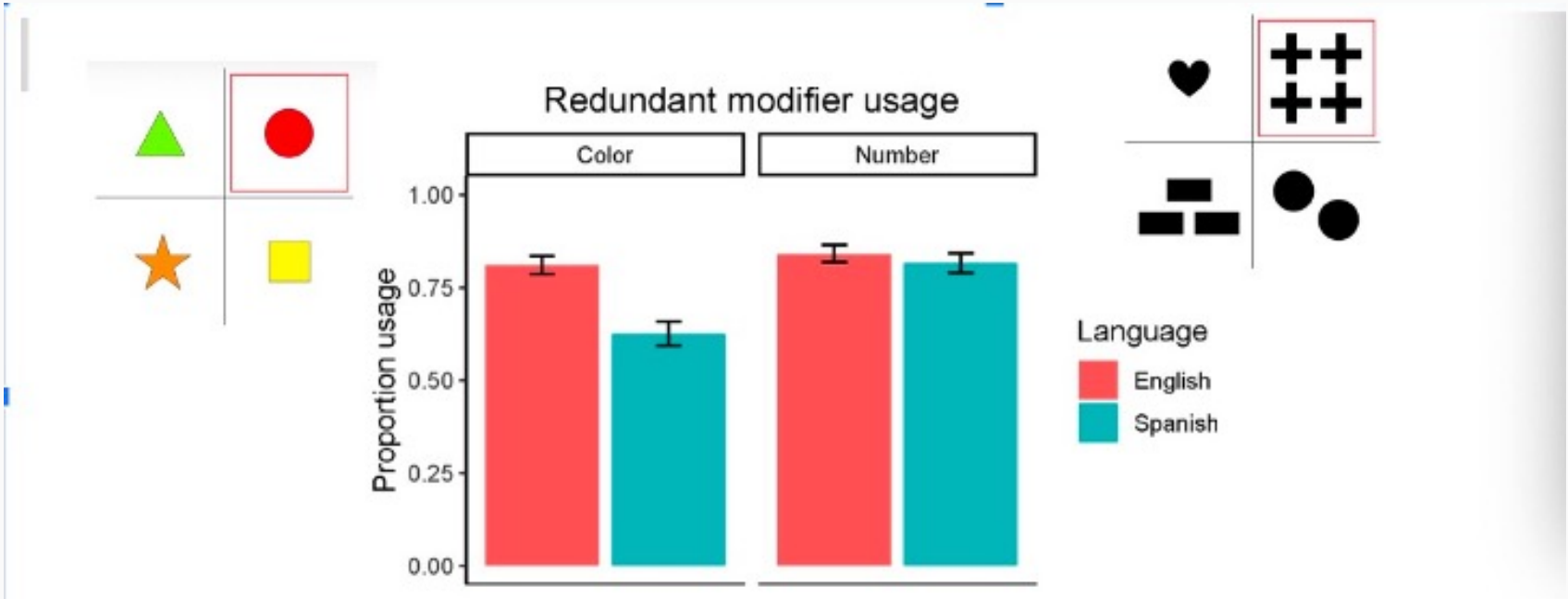


Fig. 2. Proportion usage of redundant color (left) and number (right) modifiers by language, which is indicated by color. Error bars represent 95% bootstrapped confidence intervals.

Figure 2: Wu & Gibson (2021)

- Redundant color modifier production: EG > SP
- **Redundant number modifier production: EG = SP**

Question

Why do English speakers produce **more** redundant **color** modifiers than Spanish speakers?
Why do English speakers produce the **same** amount of redundant **number** modifiers as Spanish speakers?

Hypothesis

Word order predicts these crosslinguistic differences
(Rubio-Fernandez et al., 2021; Rubio-Fernández, 2016; Wu and Gibson, 2021)

- English: Color modifier + Noun
- Spanish: Noun + Color modifier
- English: Number modifier + Noun
- Spanish: Number modifier + Noun

Experiments from Chinese, English, French and Spanish speakers

Current study

- Research gap: no previous psycholinguistic experiments testing the word order hypothesis in French and in Chinese

- Objective: based on the study of Wu & Gibson (2021) - to test this in Chinese/English vs. in French/Spanish
    - Chinese and French show the same distribution of word order across nouns and adjectives as English and Spanish respectively

- Research question: Does word order predict redundant color and number modifier production?

Experimental design based on Wu & Gibson (2021)

- Design 4 X 2 :
  - Language type :
    - Chinese/English vs. French/Spanish
  - Modifier type :
    - color modifier vs. number modifier

- One response-variable:
  - redundant expression (the red circle)
  - minimal expression (the circle)

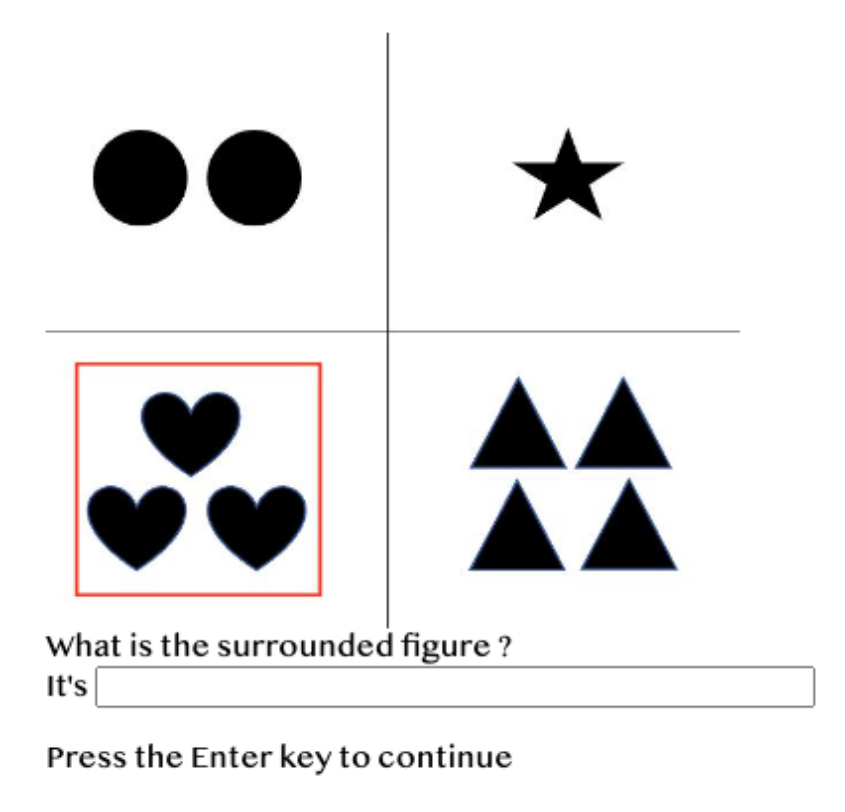
Participants

- a group of 51 L1 Chinese participants
- a group of 50 L1 English participants
- a group of 50 L1 French participants
- a group of 49 L1 Spanish participants

- similar age and education level

Completion Task

- Participants were asked to write a response to describe the surrounded object among other objects



Material based on the study of Wu & Gibson (2021)

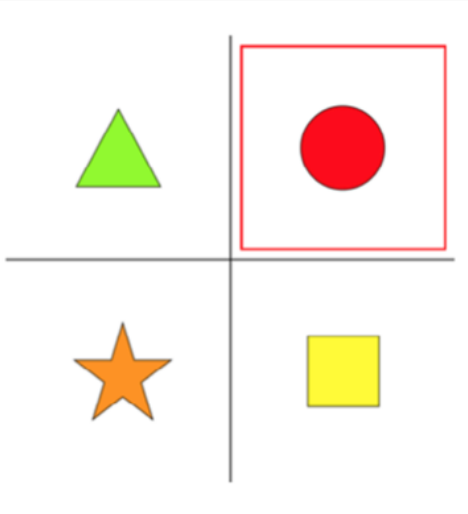


Figure 3: Color condition

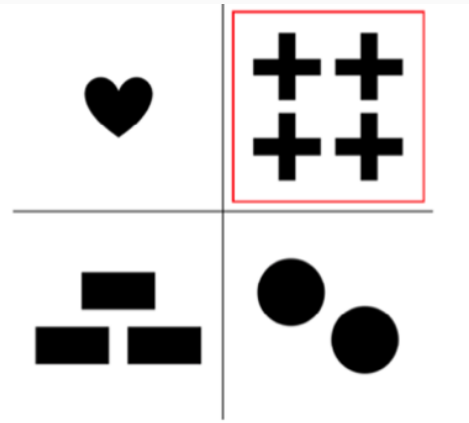


Figure 4: Number condition

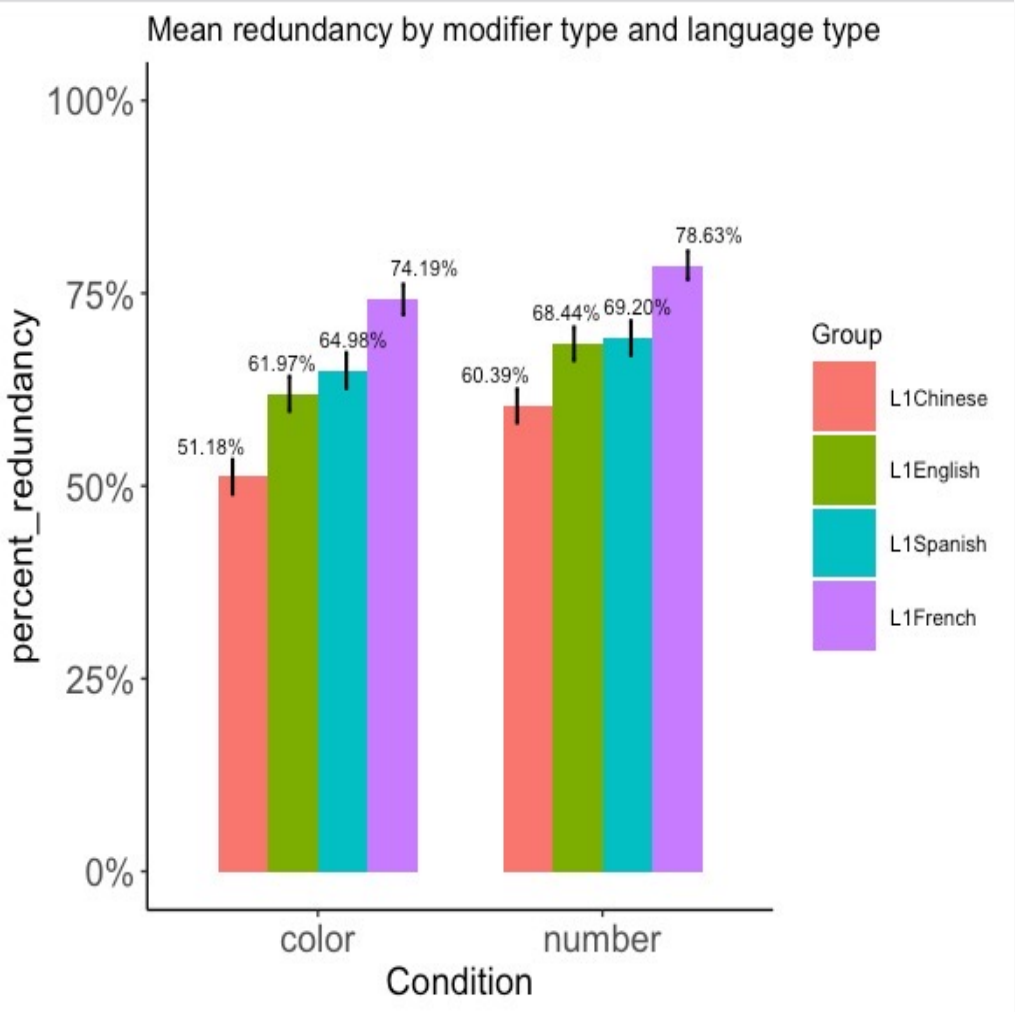
- 40 experimental items in total
  - 20 images for color condition + 20 images for number condition
- each participant -> 20 items + 20 fillers
- 2 groups of participants + 2 lists of items -> for each tested language
  - less items -> avoid strategy developing by participants

Predictions

- According to word order hypothesis
- for redundant color production
  - L1 Chinese/L1 English > L1 French/L1 Spanish
    - prenominal color modifier in CH/EG
    - postnominal color modifier in FR/SP
- for redundant number production
  - L1 Chinese/L1 English = L1 French/L1 Spanish
    - prenominal number modifier in all four languages
- an interaction effect between modifier type and language type

Results

Descriptive statistics results



- L1 Chinese < L1 English/L1 Spanish < French
- Color condition < Number condition

Results from generalized linear mixed effects model

- model = glmer(Redundancy ∼ Modifier*LangGroup +(Modifier|ID)+(LangGroup|Item), data=data, family = ”binomial”)

Fixed effects	Estimate	Std. Error	z value	Pr(> |z|)
(Intercept)	.6497	1.1720	5.674	1.4e-08 ***
Modifier	2.0936	0.5789	3.616	**0.000299 *****
LangGroupL1Chinese	-6.0152	1.5619	-3.851	**0.000118 *****
LangGroupL1English	-2.5449	1.6197	-1.571	0.116129
LangGroupL1Spanish	-3.4754	1.5718	-2.211	**0.027031 ***
Modifier:LangGroupL1Chinese	-0.8708	0.7678	-1.134	0.256743
Modifier:LangGroupL1English	-0.1398	0.8378	-0.167	0.867519
Modifier:LangGroupL1Spanish	-1.0303	0.7376	-1.397	0.162469

- a main effect of modifier type: Color < Number (p<0.05)
- a main effect of language type: CH < FR (p<0.05) / SP < FR (p<0.05)
- no significant interaction effect between modifier type and language type (p>0.05)
- $\longrightarrow$ Our results are not compatible with the word order hypothesis

Next question

How to explain our results if the word order hypothesis does not hold for our study ?

Important fact to consider

Chinese speakers < French speakers

Contrary to the prediction of the word order hypothesis

Why are Chinese speakers less redundant than French speakers?

Hypothesis

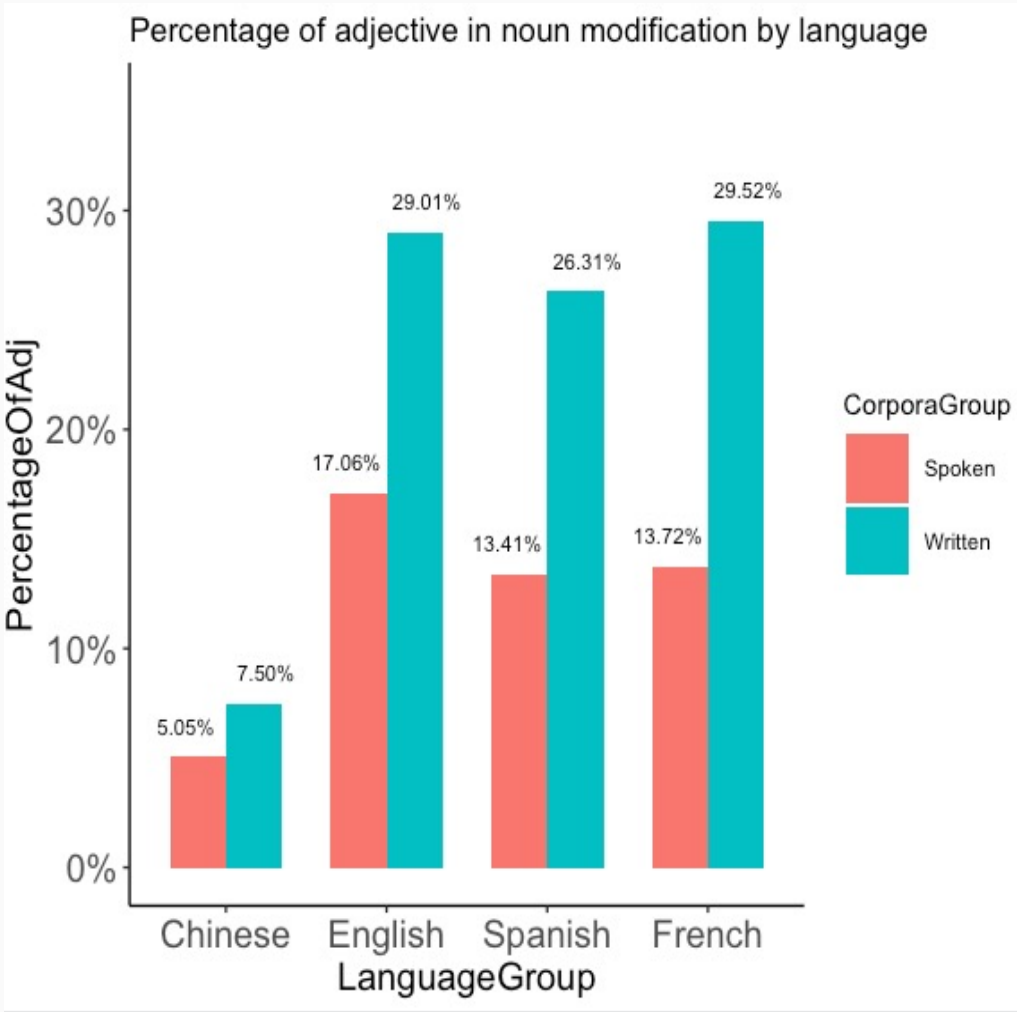
- Chinese speakers less exposed to adjectives as noun modifier in general -> less redundant adjective production
- French speakers more exposed to adjectives as noun modifier in general -> more redundant adjective production
- **Adjective frequency predicts the crosslinguistic differences (following Bybee, 2010)**

Corpus study on adjective frequency

Testing the adjective frequency hypothesis two corpora

- Corpus study in collaboration with Archille Falaise, Loïc Liégeois & Alexandre Roulois (Laboratoire de Linguistique Formelle)
- ScienQuest -> spoken corpus
  - film subtitles
- Parallel Universal dependencies (PUD) -> written corpus

Results from spoken corpus & written corpus



- Corpus results partially in line with experiments
  - Chinese adjectives (both modalities)
  - French speakers (written modality)

Conclusion & Discussion

Conclusion

- **Original hypothesis:**
  - Word order predicts the crosslinguistic differences in redundant adjective production
- **Current study:**
  - Adjective frequency partially predicts the crosslinguistic differences in redundant adjective production
- **Redundant modifier production is a complex question -> including many factors**
  - Visual-context factors (Jara-Ettinger and Rubio-Fernandez, 2022; Long et al., 2021; Rubio-Fernandez, 2019, 2021; Rubio-Fernández, 2016)
  - Interactive factors (Rubio-Fernandez, 2019; Rubio-Fernández, 2016)
  - Linguistic factors
    - Word order (Kachakeche et al., 2021; Rubio-Fernandez et al., 2021; Wu and Gibson, 2021))
    - Adjective frequency

Why are adjectives less used as noun modifiers in Chinese than in other languages?

1. The main function of adjective in Chinese is predication (rather than modification) (Hou youlan 1993, He Yang 1996)
2. Chinese is a verb-like language whereas English is a noun-like language (Liu Danqing 2010)
    - He is a **good** speaker and writer
    - 他能说会写

Why are adjectives less used as noun modifiers in Chinese than in other languages? (cont.)

3. No corresponding deverbal adjectives in Chinese such as *masked*, *uniformed* -> expressed by relative clauses in Chinese
    - a **masked** person
    - 一个戴口罩的人
4. Adjective is less frequent than noun as noun modifier in Chinese while they are equally used in noun modification in English (Chen Gang 2012)

Kachakeche et al., 2021:

- a general word order effect across different languages
- but an expection with Chinese (prenominal language with low noun modification)

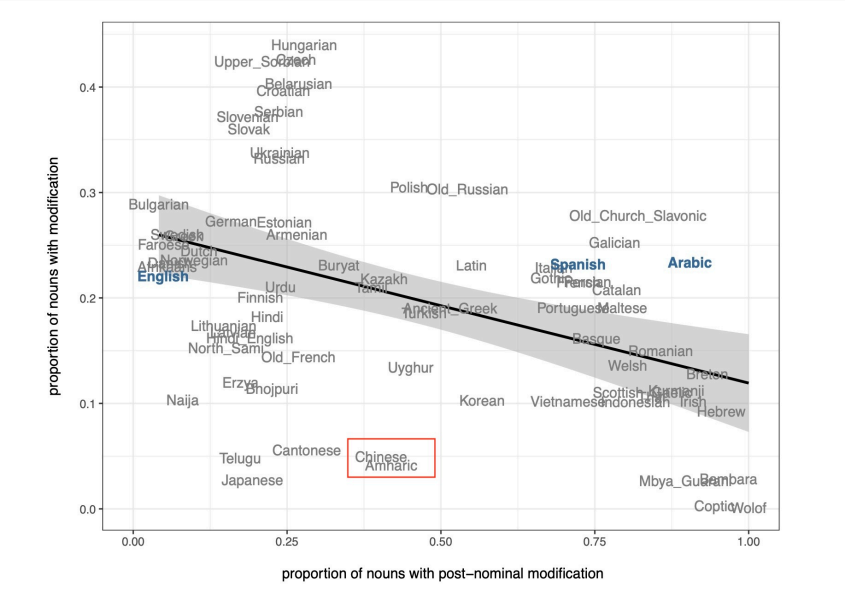


Figure 5: Kachakeche et al., 2021

Our study: less adjective modification + less redundant adjective production by Chinese speakers

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Further questions

- Why are French speakers highly redundant?
- Why are French speakers more redundant than Spanish speakers?
- Why are color modifiers less redundant than number modifiers ?
- Is this pattern specific to written modality ? (written version vs. spoken version)
- Is this pattern specific to number modifiers ? (size condition)