Online Experiments for Language Scientists

Lecture 9: Zipf's Law of Abbreviation

Kenny Smith

kenny.smith@ed.ac.uk

Assessment 2 Q&A

- Due on 5th December
- Read the assignment brief (linked from https://kennysmithed.github.io/oels2024/)
- We can help with basic coding stuff in extra drop-in labs (see times on github course page)
- **Happy to answer questions now, or email me (be aware: I am travelling 25th to 30th November, responses may be delayed)**
- No questions after 10am on Monday 2nd December (other than in drop-ins)

Kanwal et al (2017)

Kanwal, J., Smith, K., Culbertson, J., & Kirby, S. (2017). Zipf's Law of Abbreviation and the Principle of Least Effort: Language users optimise a miniature lexicon for efficient communication. *Cognition, 165*, 45-52.

A dyadic interaction experiment using a miniature language

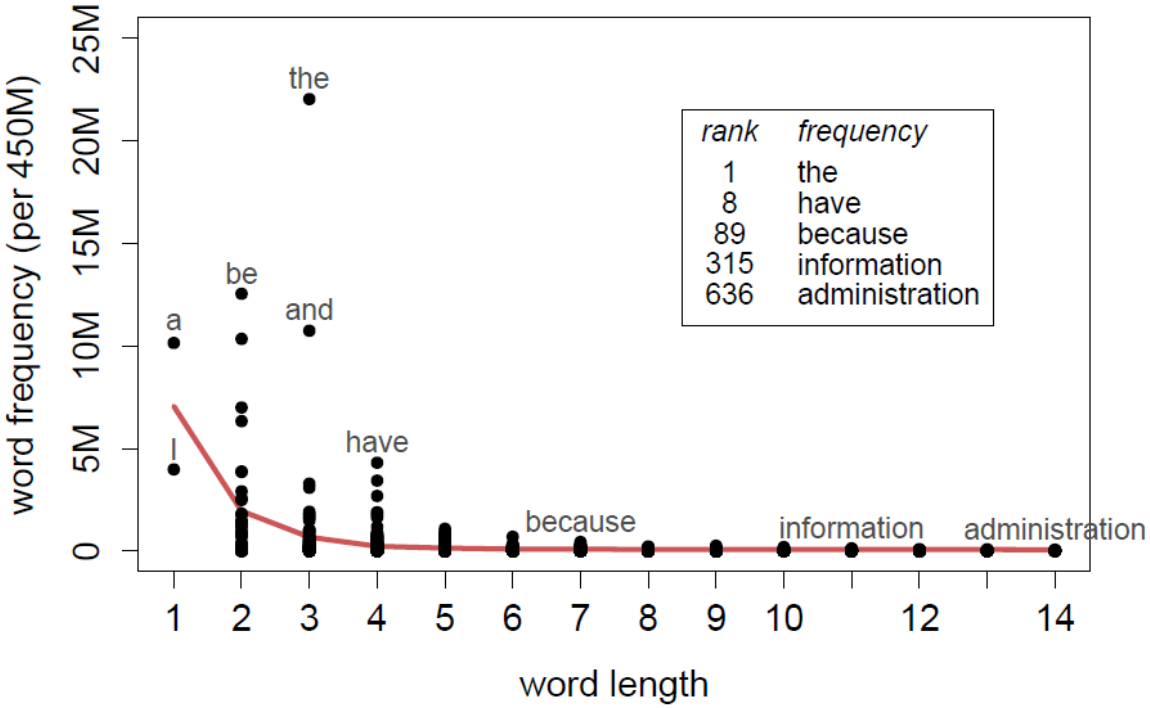
- Does Zipf's Law of Abbreviation arise from competing pressures to communicate accurately but efficiently?

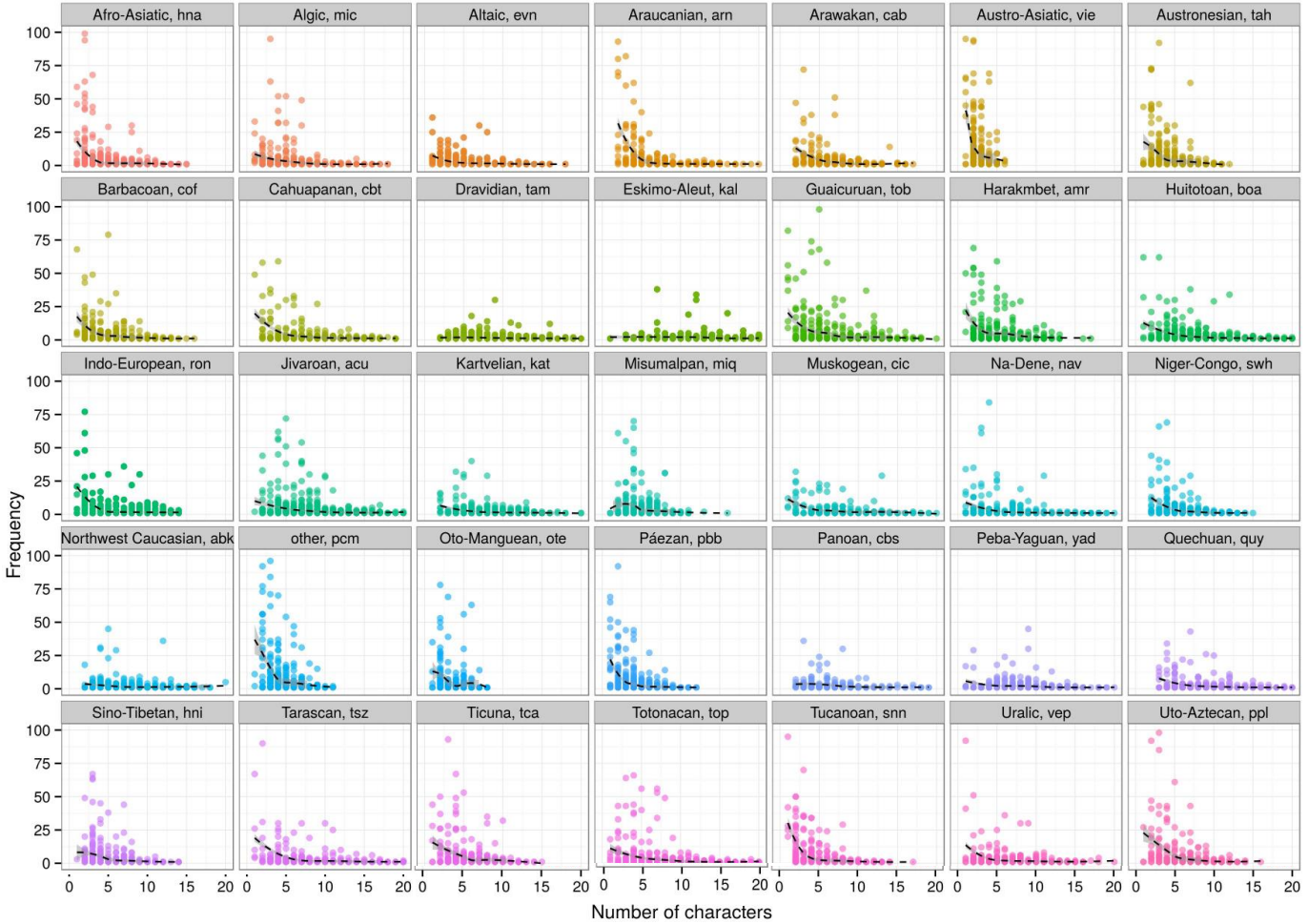
Jasmeen Kanwal
(Edinburgh)

Jenny Culbertson
(Edinburgh)

Simon Kirby
(Edinburgh)

Zipf's Law of Abbreviation: frequent words are short





Benz & Ferrer i Cancho, 2016, *Proc Leiden Workshop on Capturing Phylogenetic Algorithms for Linguistics*

Manipulating communicative need and production effort

zop x 4
zopekil x 4

zop x 12
zopoudon x 12

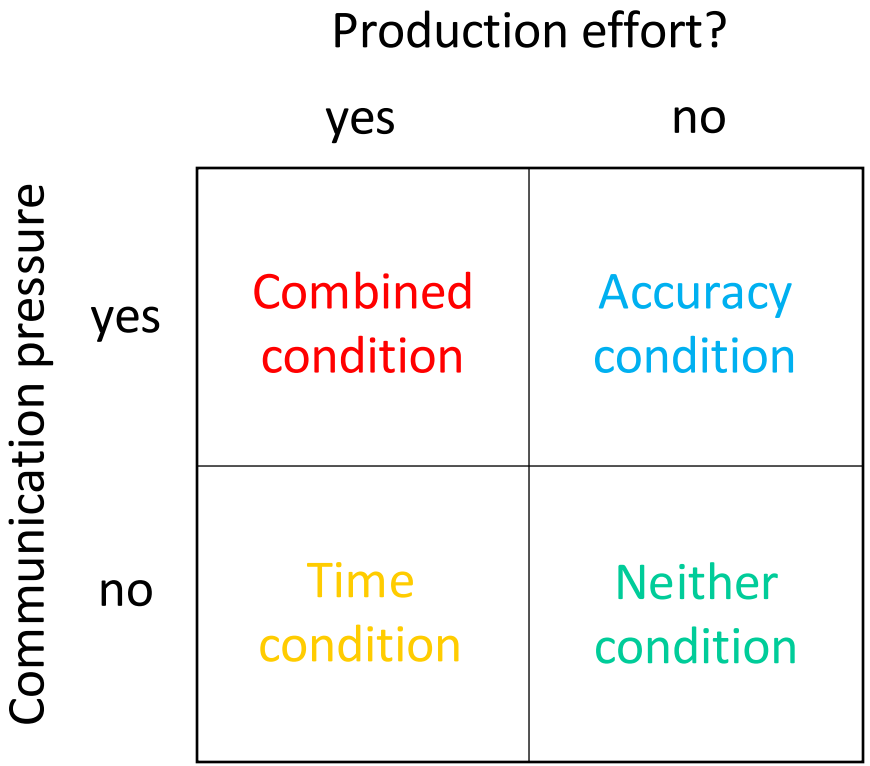
- Communicative task **or** asocial recall task
- Production effort depends on length **or** it doesn't

Waiting for partner

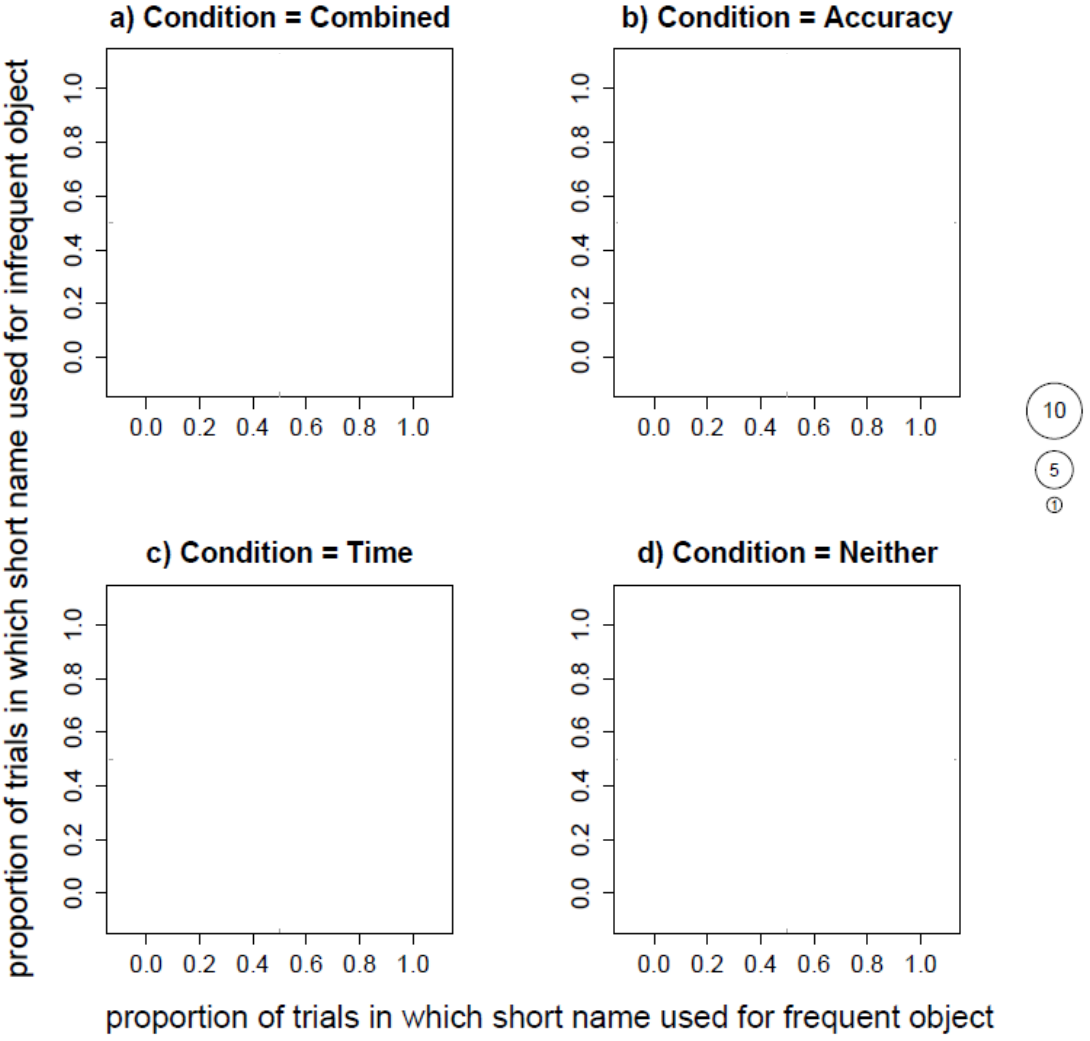
Choose a name to describe this object to your partner.

zopekil

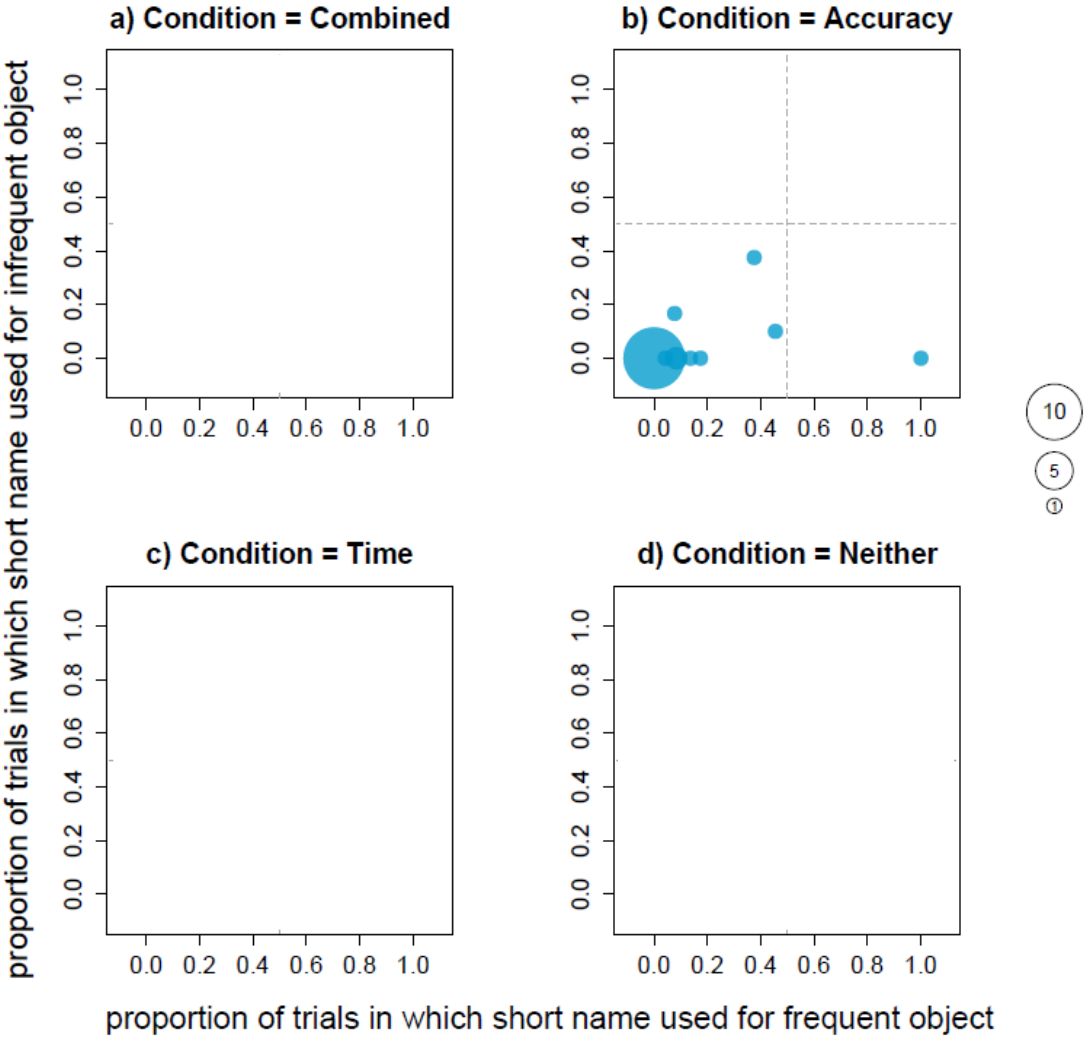
zop


Production effort?
yes
no
Communication pressure
yes
no
Combined condition
Accuracy condition
Time condition
Neither condition

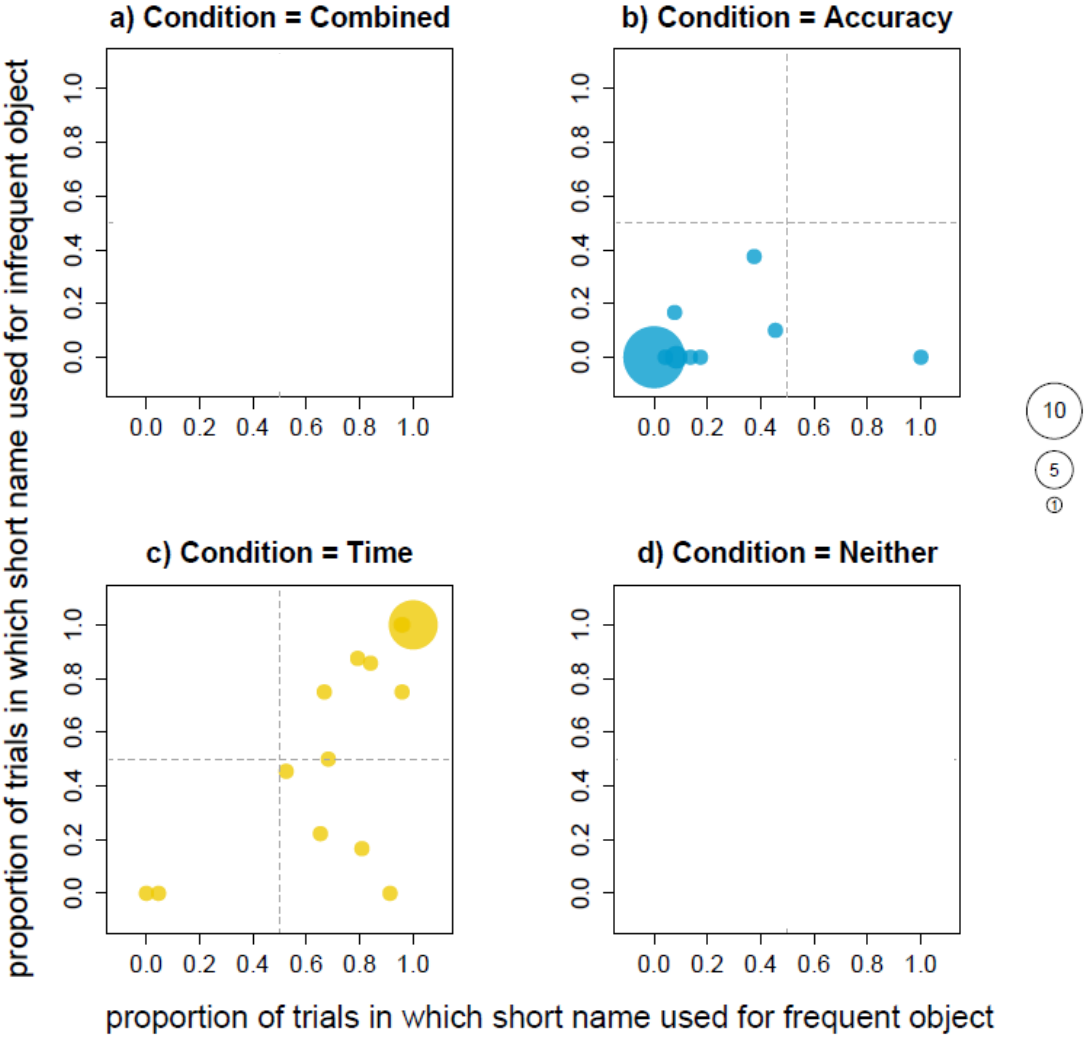
Results


a) Condition = Combined
b) Condition = Accuracy
c) Condition = Time
d) Condition = Neither
proportion of trials in which short name used for infrequent object
proportion of trials in which short name used for frequent object
0.0
0.2
0.4
0.6
0.8
1.0
10
5
1

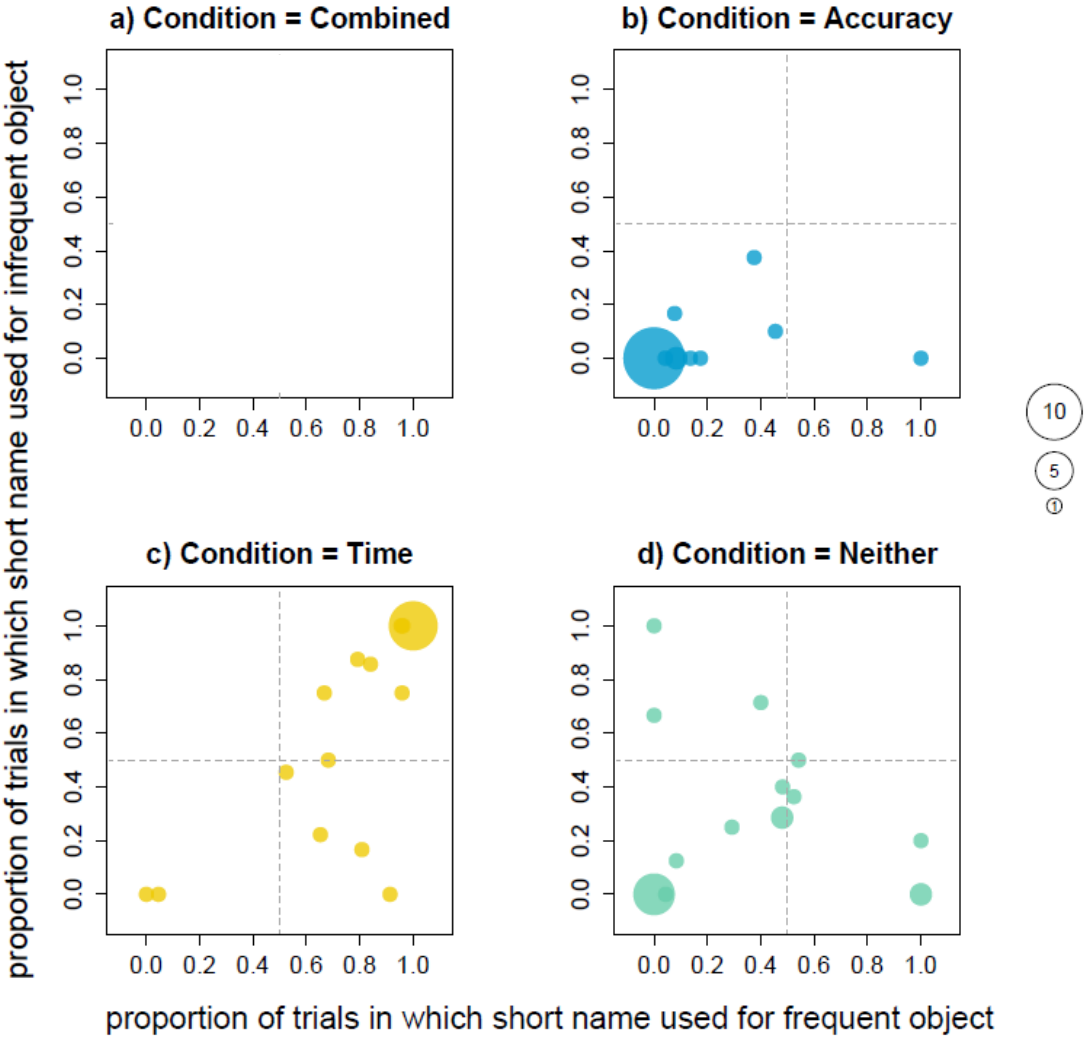
Results


a) Condition = Combined
b) Condition = Accuracy
c) Condition = Time
d) Condition = Neither
proportion of trials in which short name used for infrequent object
proportion of trials in which short name used for frequent object
0.0
0.2
0.4
0.6
0.8
1.0
10
5
1

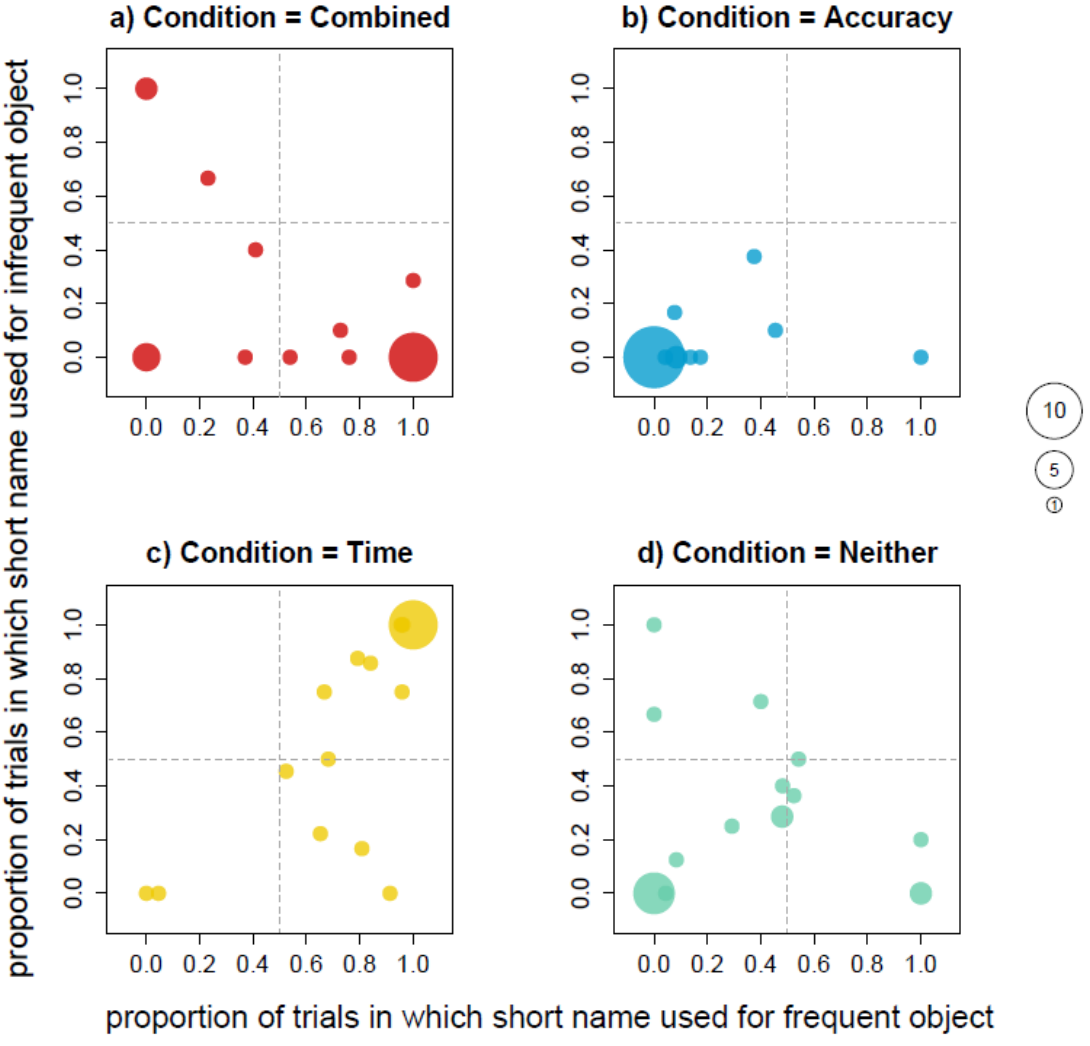
Results


a) Condition = Combined
b) Condition = Accuracy
c) Condition = Time
d) Condition = Neither
proportion of trials in which short name used for infrequent object
proportion of trials in which short name used for frequent object
0.0
0.2
0.4
0.6
0.8
1.0
10
5
1

Results


a) Condition = Combined
b) Condition = Accuracy
c) Condition = Time
d) Condition = Neither
proportion of trials in which short name used for infrequent object
proportion of trials in which short name used for frequent object
0.0
0.2
0.4
0.6
0.8
1.0
10
5
1

Results


a) Condition = Combined
b) Condition = Accuracy
c) Condition = Time
d) Condition = Neither
proportion of trials in which short name used for infrequent object
proportion of trials in which short name used for frequent object
0.0
0.2
0.4
0.6
0.8
1.0
10
5
1

Kanwal et al.’s conclusions

Zipf’s law of abbreviation is a result of jointly optimizing competing pressures to communicate both accurately and efficiently

- Just accuracy or just efficiency is not enough

Time for additional Q&A/discussion on this week's reading

Next up

Wednesday, 9am: our last lab!

- A dyadic interaction experiment
- Possibly using jsPsych v7!

Subsequently: optional drop-ins for debugging help with final assessment code, see github page for details