Online Experiments for Language Scientists

Lecture 9: Zipf's Law of Abbreviation

Kenny Smith

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Upcoming strike action, 1st-3rd December

Little impact on this course since we are basically done with teaching, but

- Might delay return of marks from Assessment 1 (due 2nd December)
- I won't respond to emails on those dates
- (No drop-in labs on those dates)

Assessment 2 Q&A

- Due on 9th December
- Read the assignment brief (https://kennysmithed.github.io/oels2021/AssignmentBrief.pdf)
- **Happy to answer questions now**
- We can help with basic coding stuff in labs (this Wednesday or extra drop-in labs)
- No questions after 11am on Monday 6th December!

Additional drop-in labs

Optional drop-ins for debugging help with Assessment 2 code, on Gather

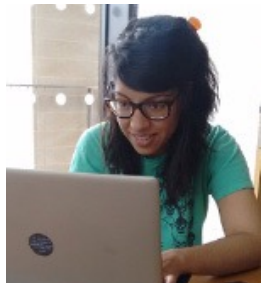
- Wednesday 24th November, 2pm-4pm
- Thursday 25th November, 2pm-4pm
- Monday 29th November, 9am-11am
- Monday 6th December, 9am-11am

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.

An dyadic interaction experiment using a miniature language

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

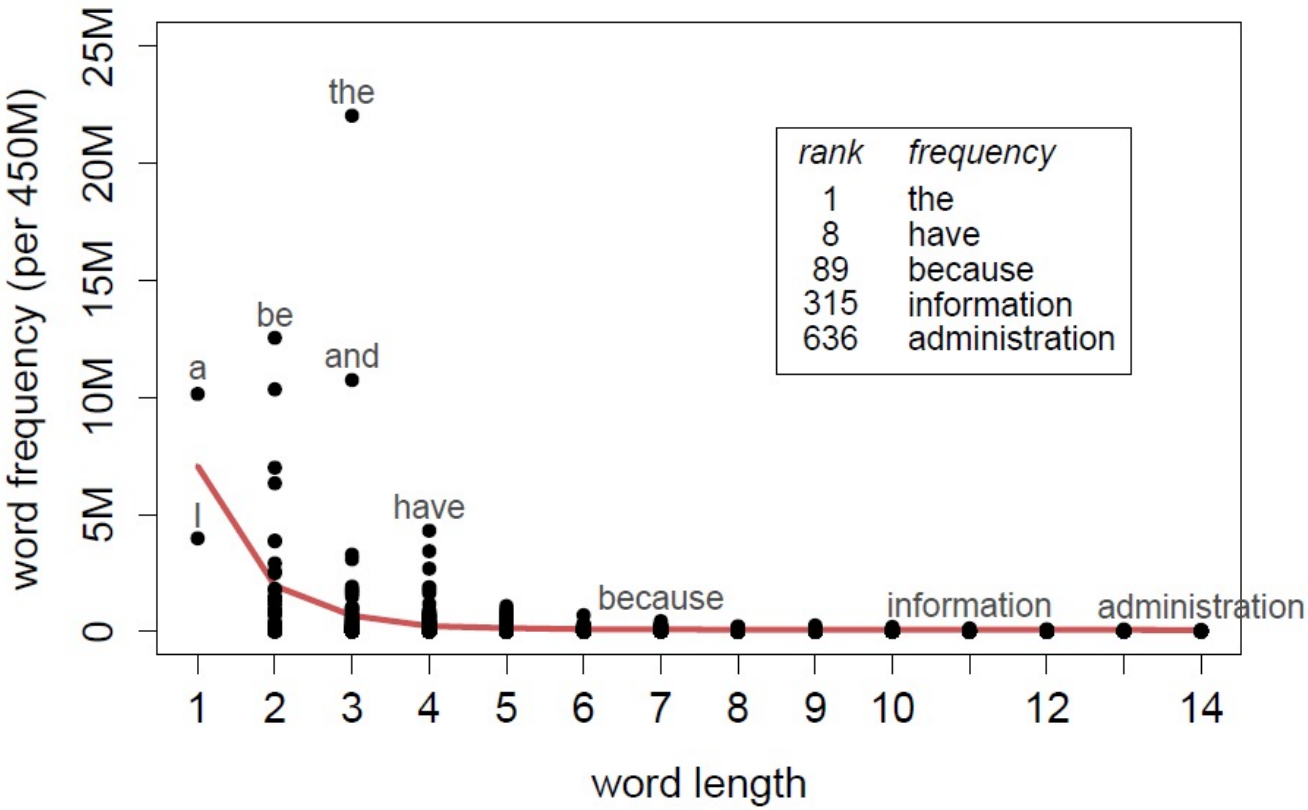


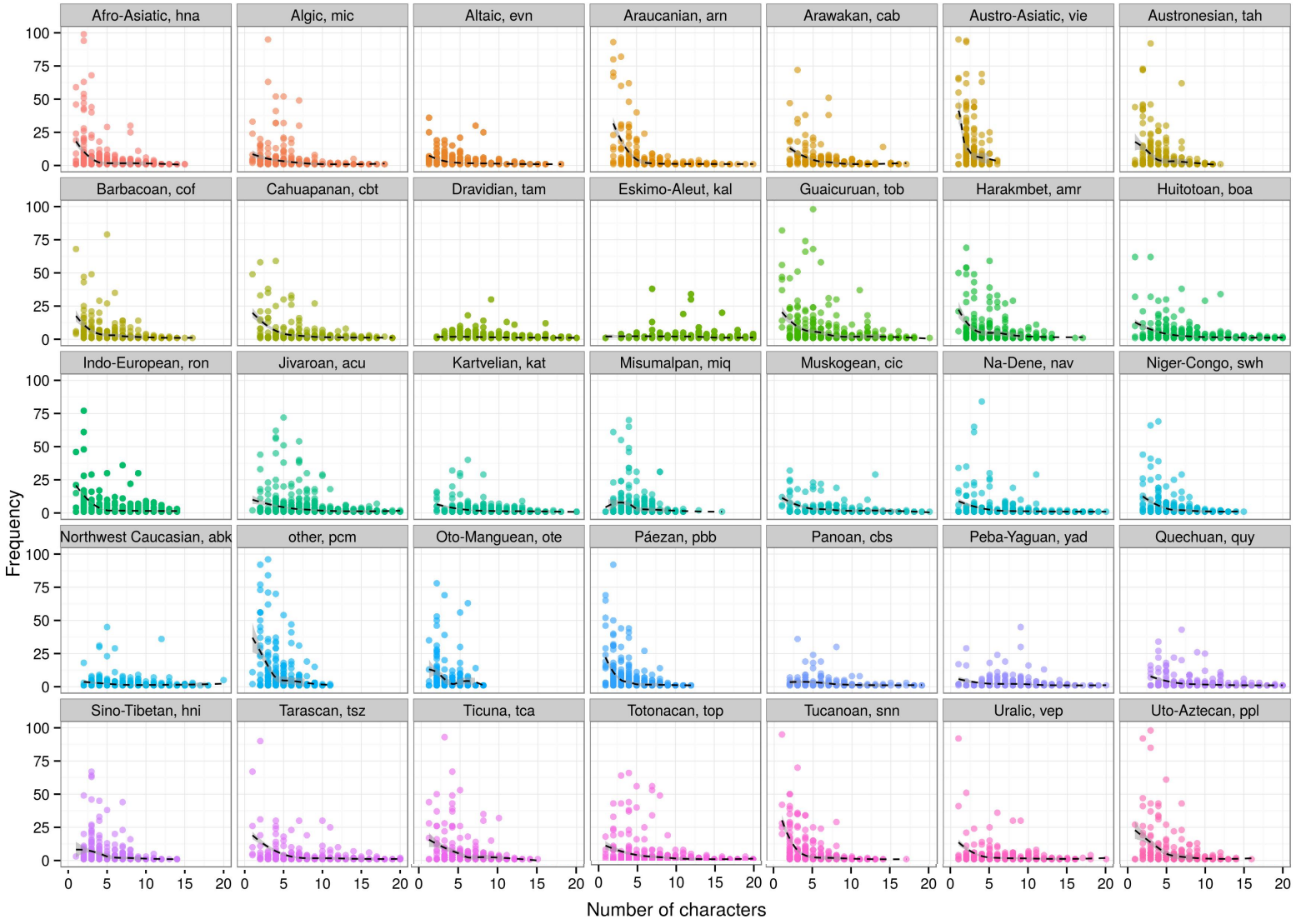
Jasmeen Kanwal
(now at St Andrews)

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

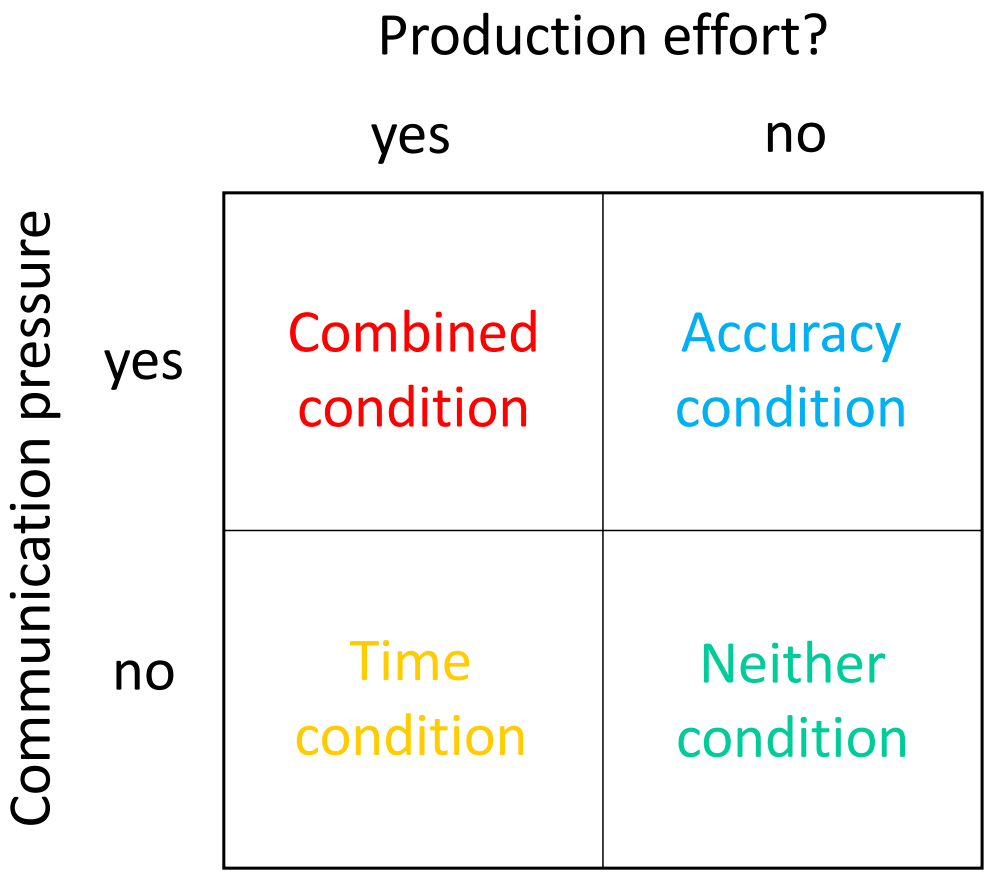
- Communicative task **or** asocial recall task
- Production effort depends on length **or** it doesn't

Waiting for partner

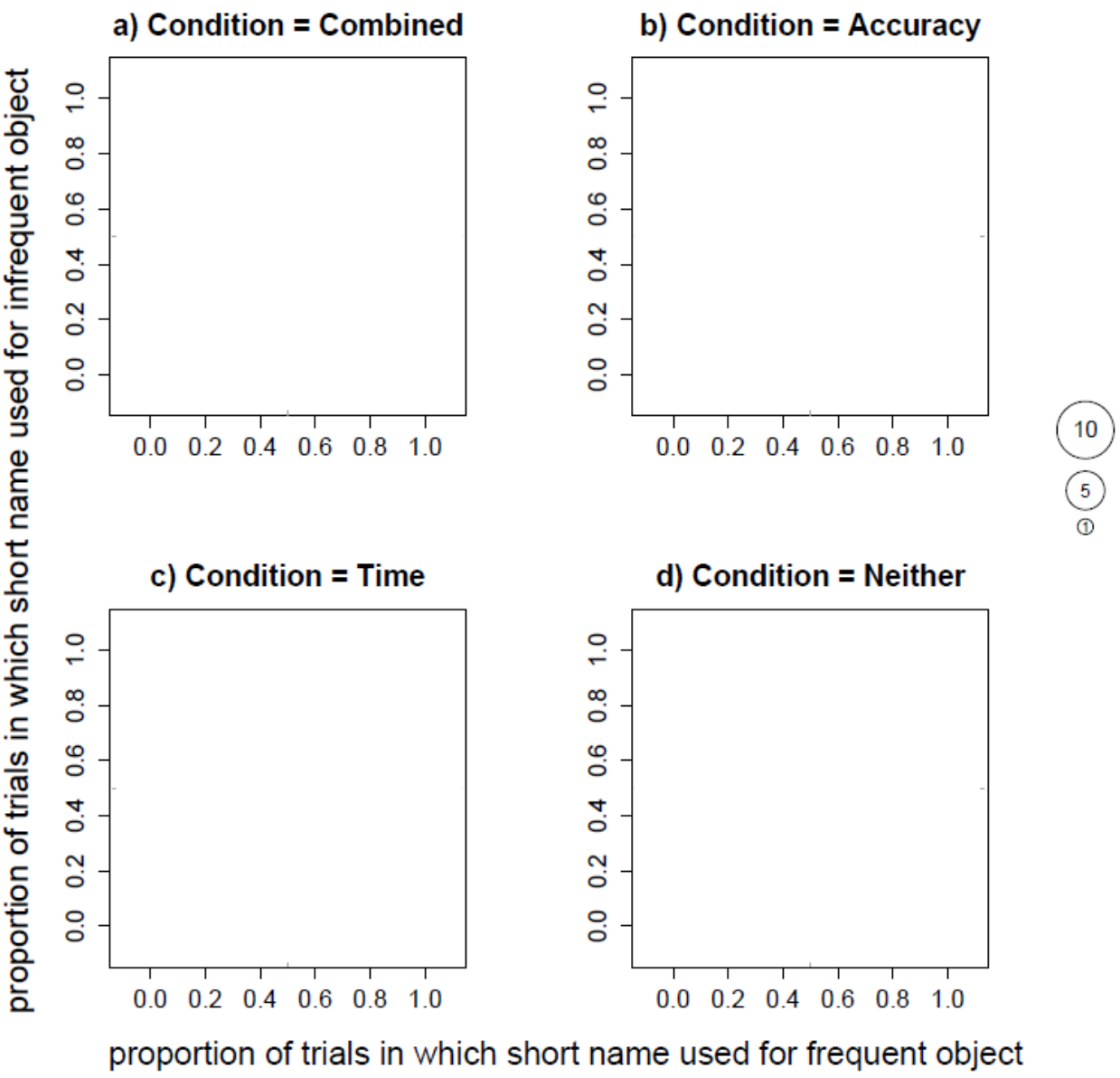
Choose a name to describe this object to your partner.

zopekil

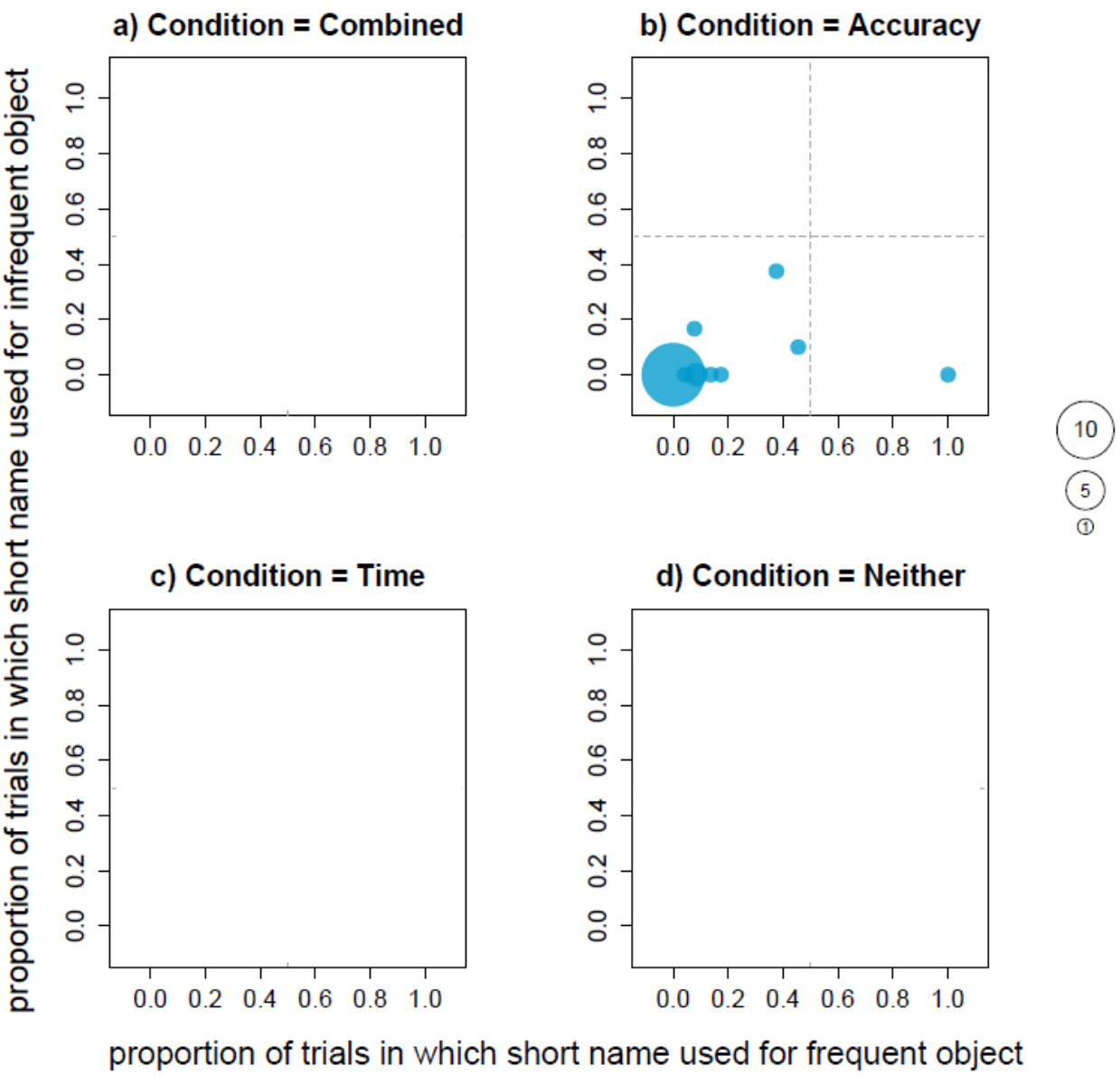
zop


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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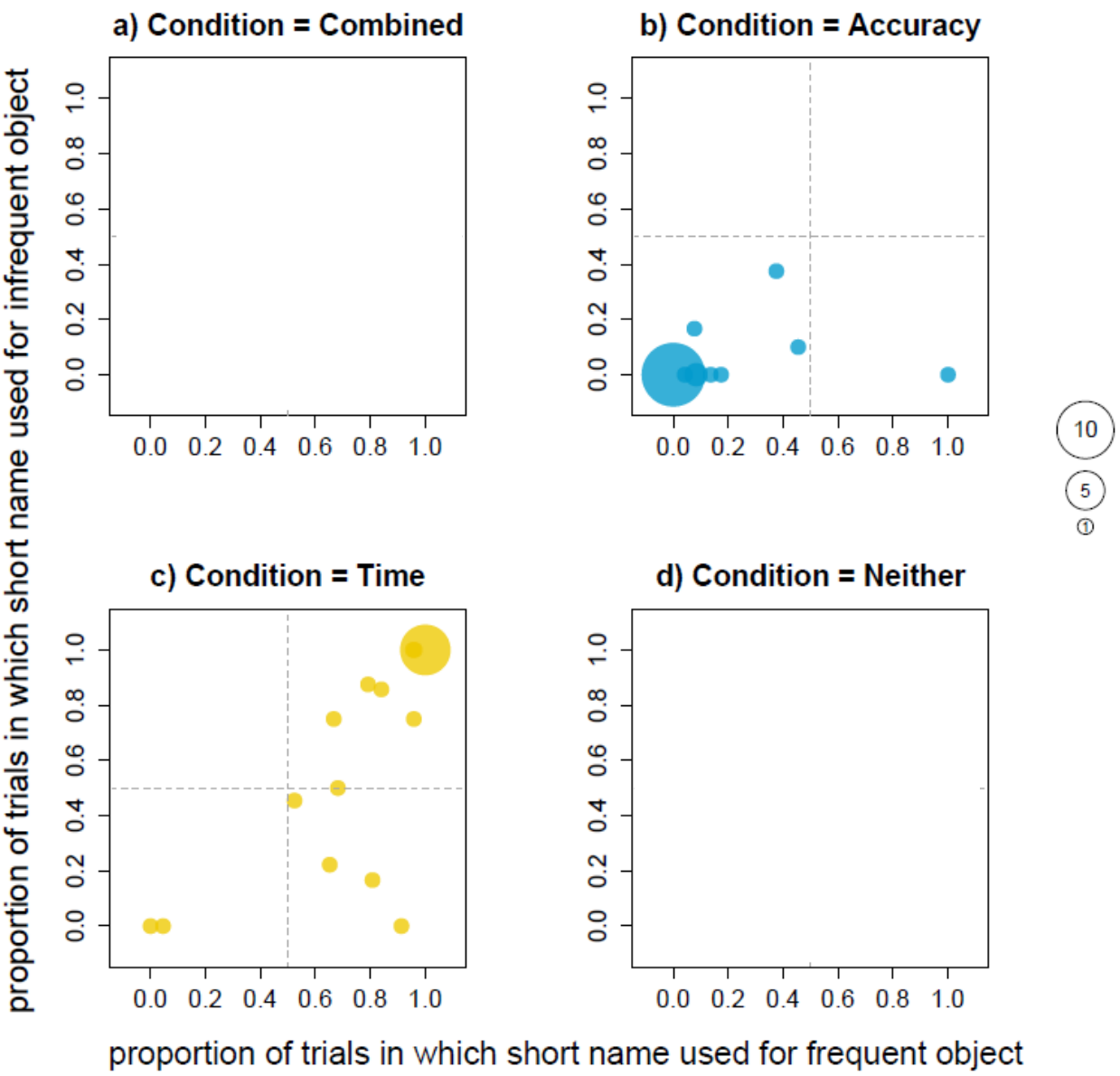
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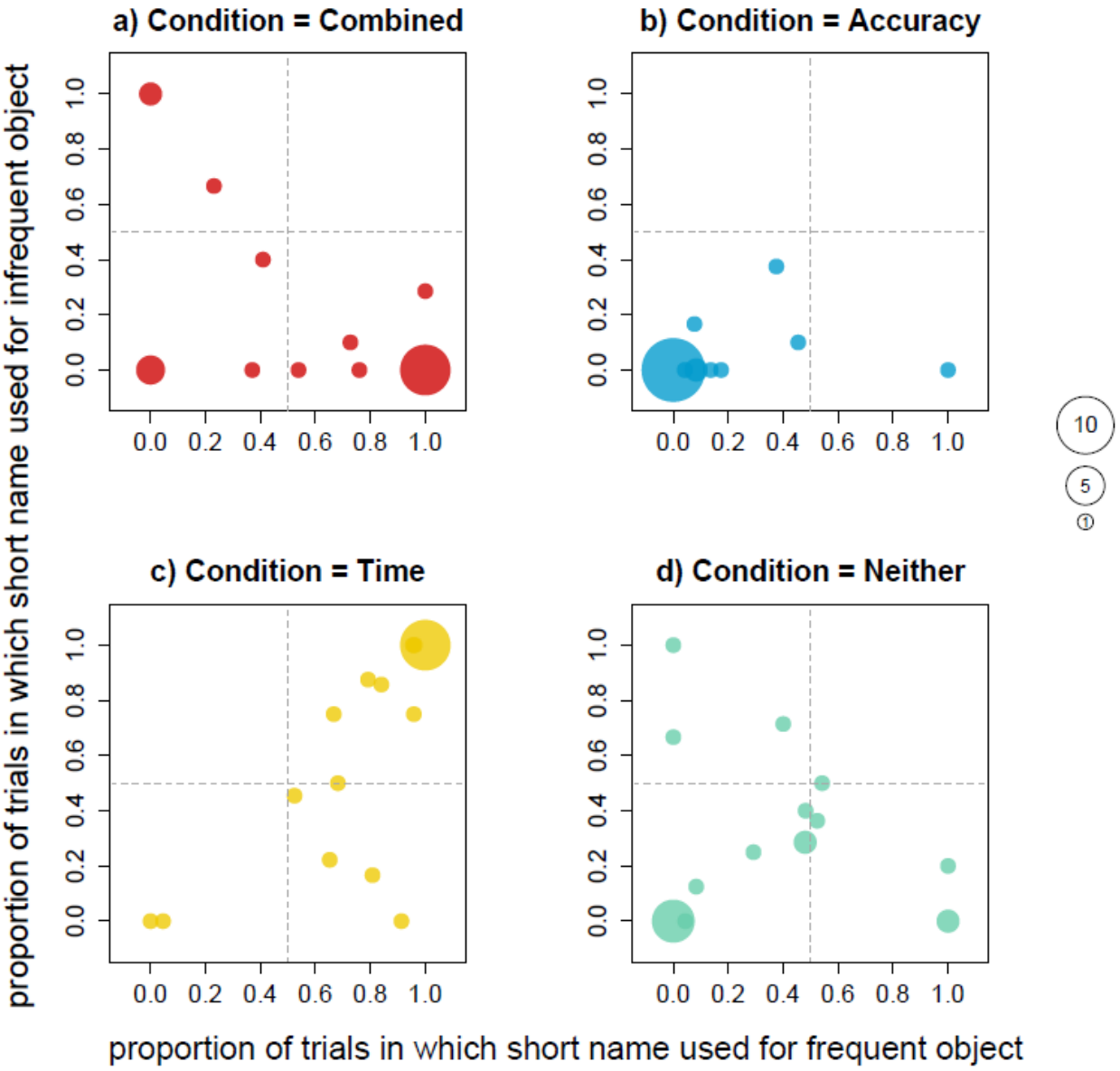
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Kanwal et al.’s conclusions

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 Q&A/discussion on this week’s reading

Next up

Wednesday, 9am: lab on Gather

- A dyadic interaction experiment

Subsequently: optional drop-ins for debugging help with Assessment 2 code, on Gather

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