

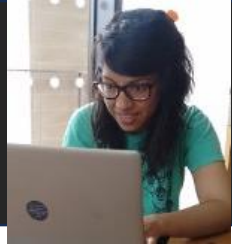
Online Experiments for Language Scientists

Lecture 9: Zipf's Law of Abbreviation

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Kanwal et al. (2017)



Jasmeen Kanwal

(Edinburgh, current job in Data Education in Schools, Moray House)

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*.

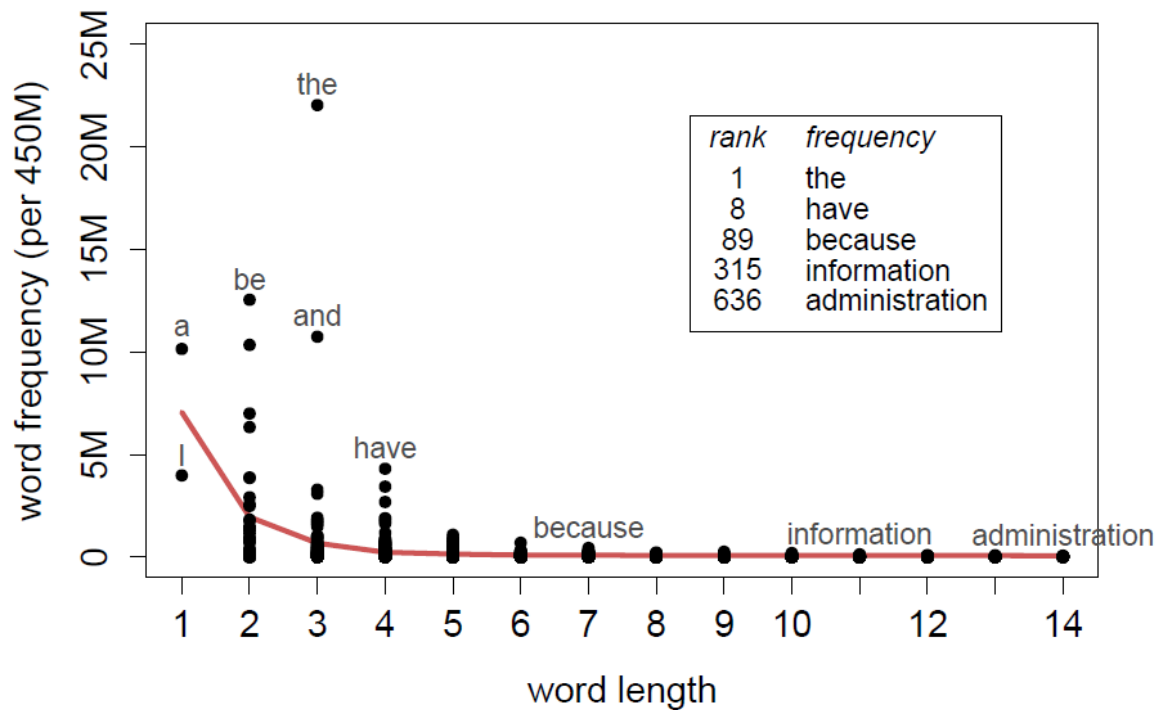
Design:

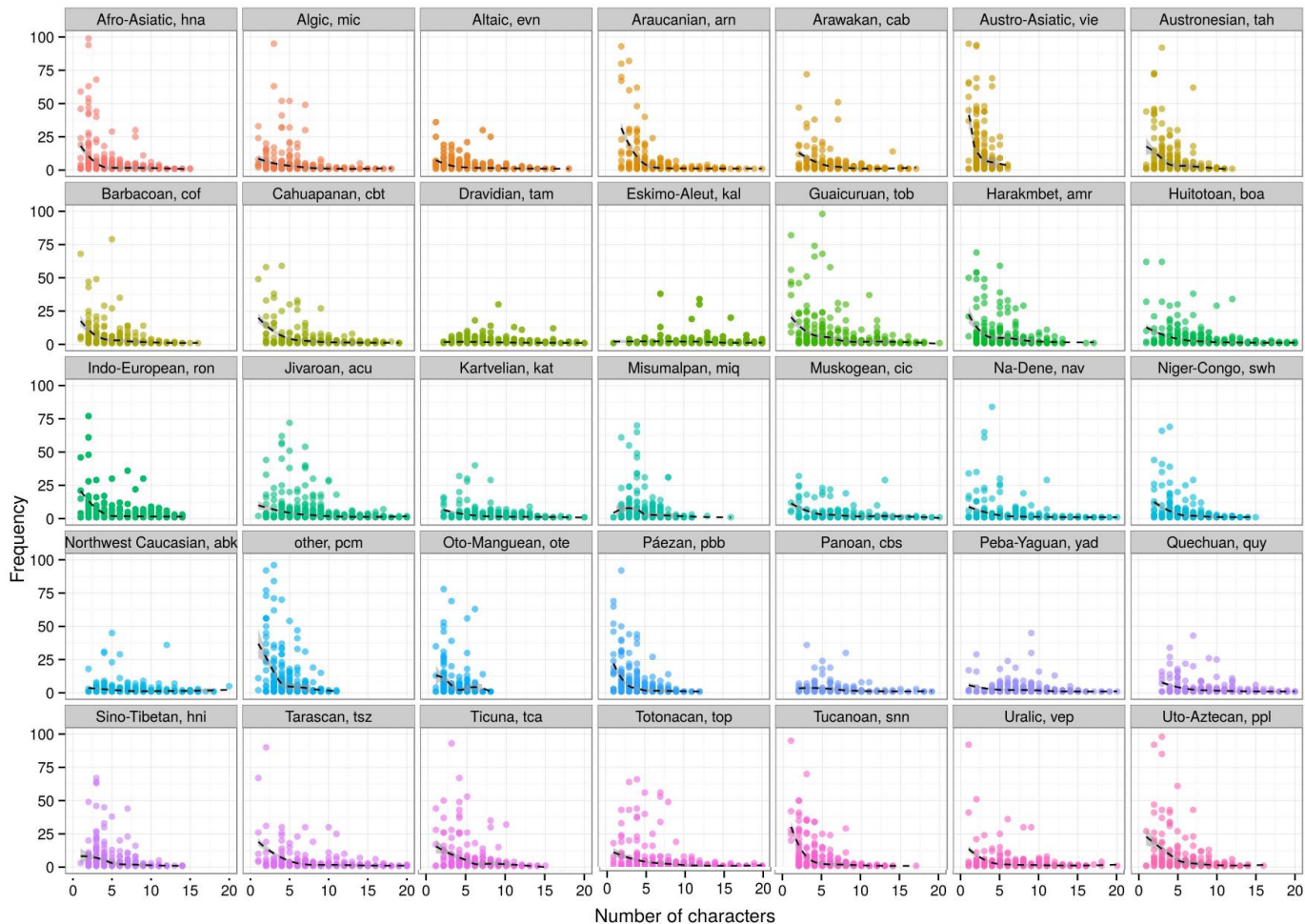
- Dyadic interaction using a miniature language

Question:

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

Zipf's Law of Abbreviation

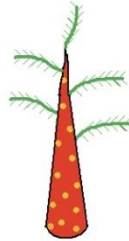




Manipulating communicative need + effort



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

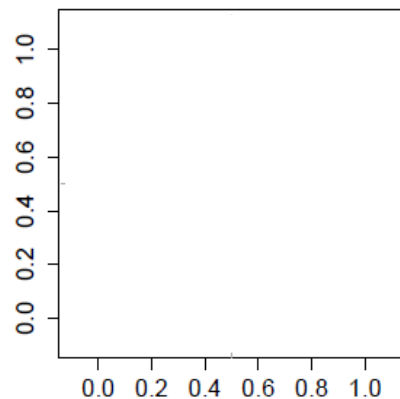
Conditions

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

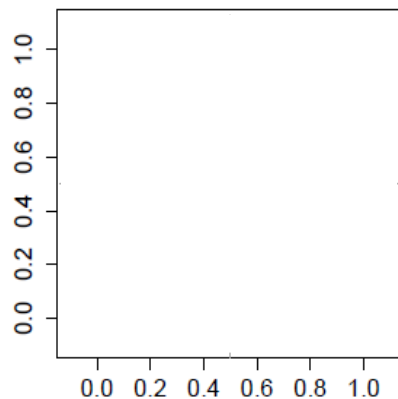
Results

proportion of trials in which short name used for infrequent object

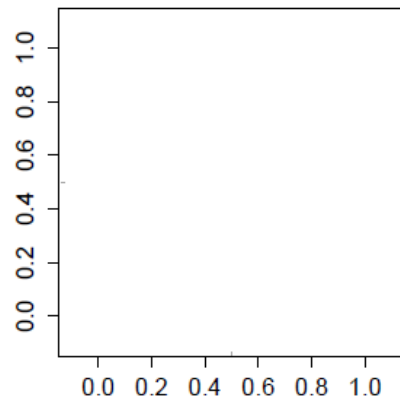
a) Condition = Combined



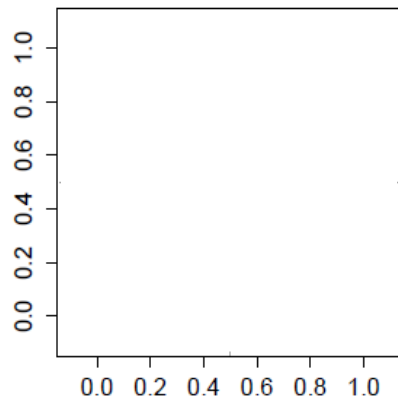
b) Condition = Accuracy



c) Condition = Time



d) Condition = Neither



proportion of trials in which short name used for frequent object

10

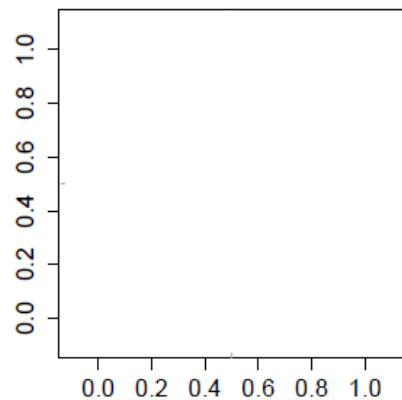
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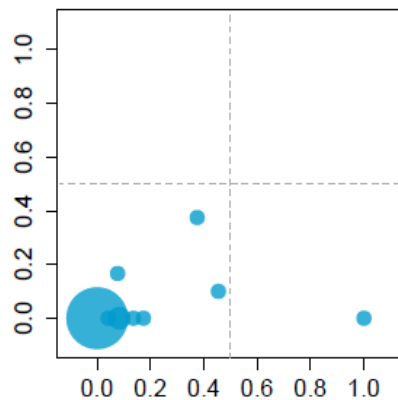
Results

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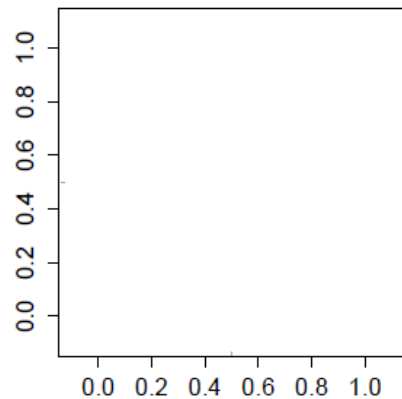
a) Condition = Combined



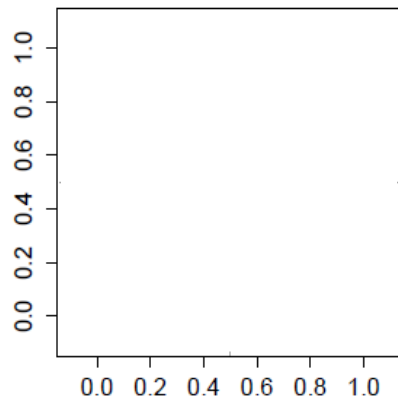
b) Condition = Accuracy



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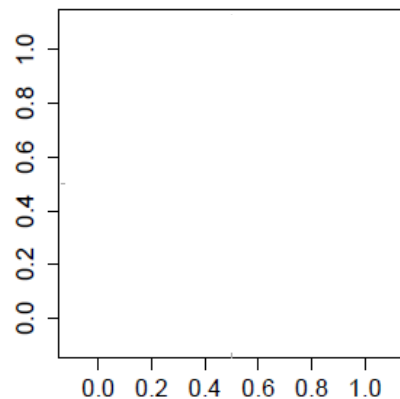
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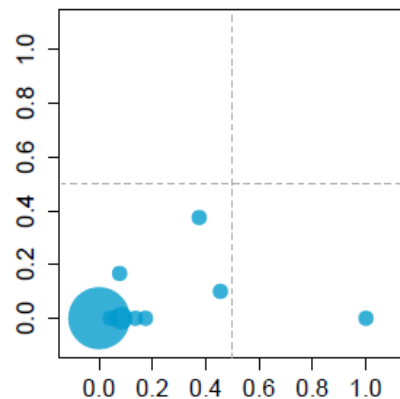
Results

proportion of trials in which short name used for infrequent object

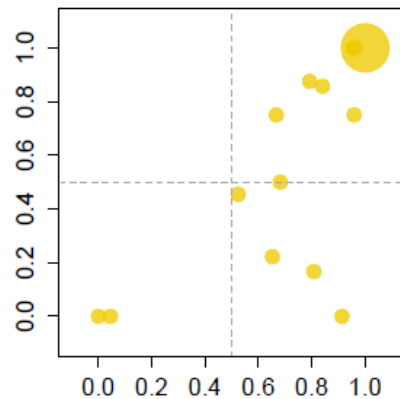
a) Condition = Combined



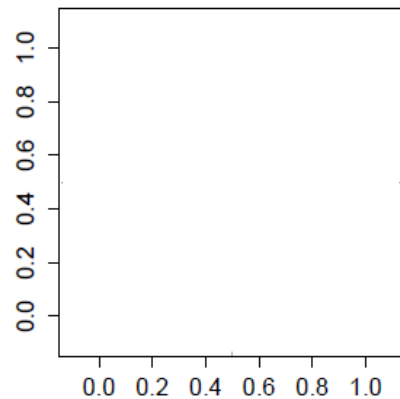
b) Condition = Accuracy



c) Condition = Time



d) Condition = Neither



10

5

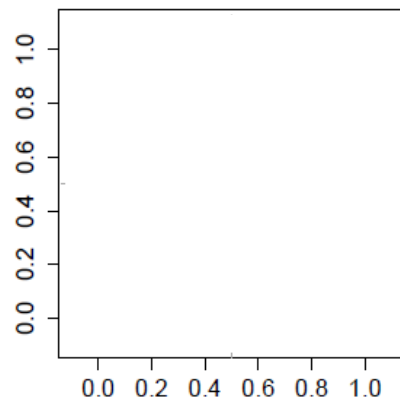
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proportion of trials in which short name used for frequent object

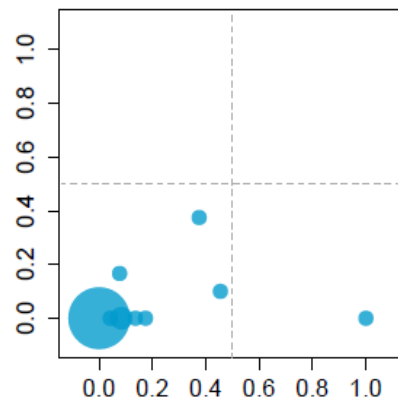
Results

proportion of trials in which short name used for infrequent object

a) Condition = Combined



b) Condition = Accuracy

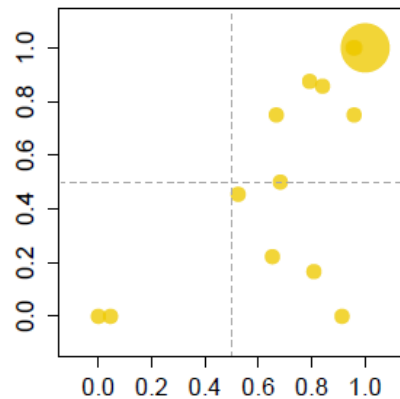


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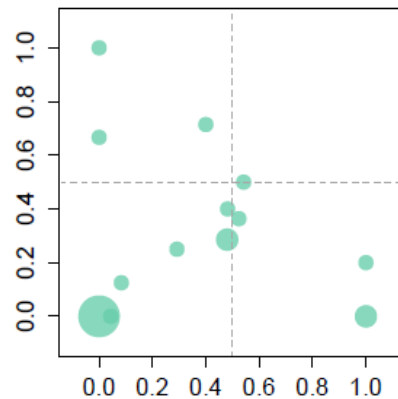
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1

c) Condition = Time

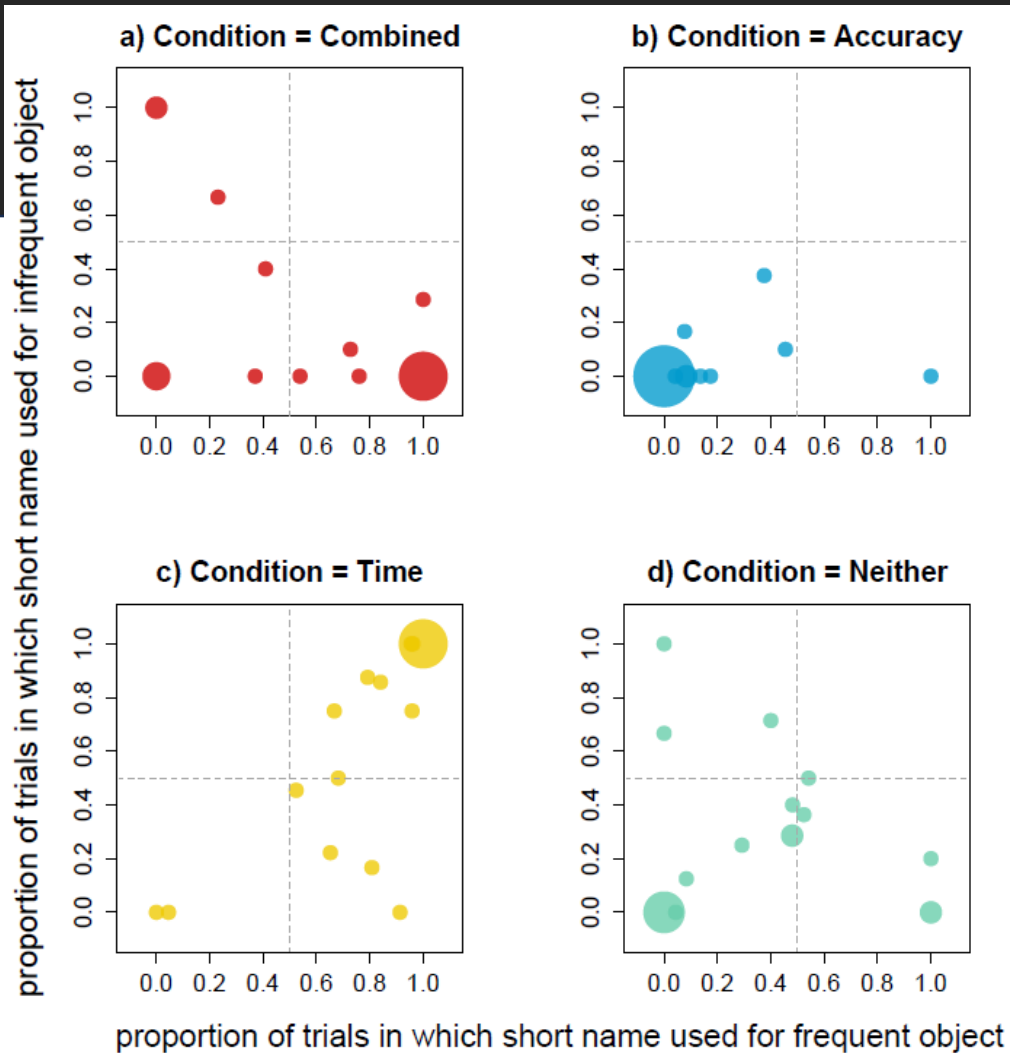


d) Condition = Neither



proportion of trials in which short name used for frequent object

Results



Kanwal et al.'s conclusion

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