

# Extending communication games to more players

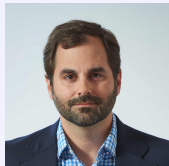
Veronica Boyce

LangCog Lab Meeting

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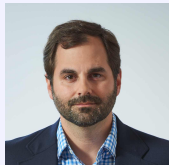
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# Why study communication?

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Some of this is conventionalized, but some is dynamic.

# Partner-specific adaptation



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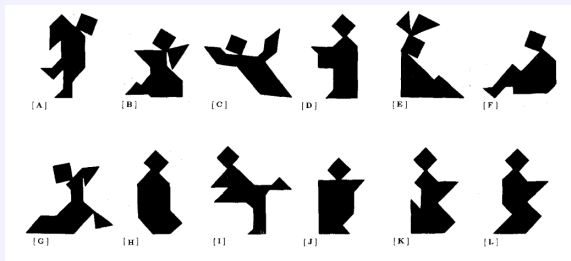
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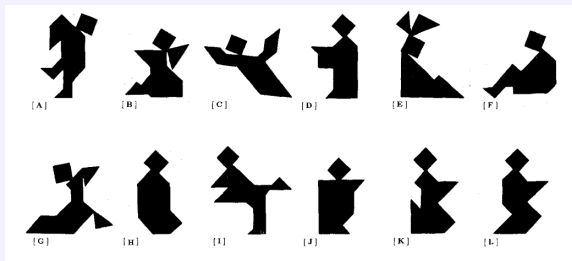
- Audience design
- Common ground
- “Aim Low” (ex. Yoon & Brown-Schmidt 2019)

# Clark & Wilkes-Gibbs 1986

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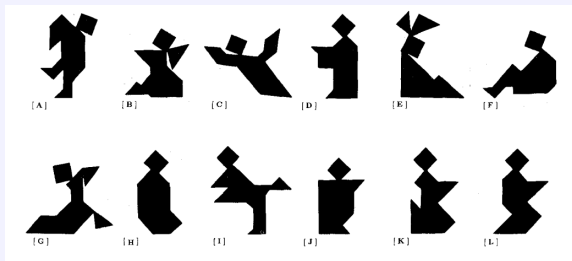
# Clark & Wilkes-Gibbs 1986



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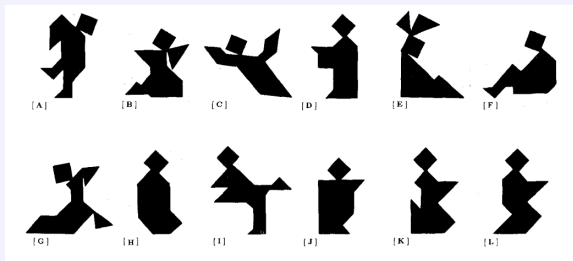


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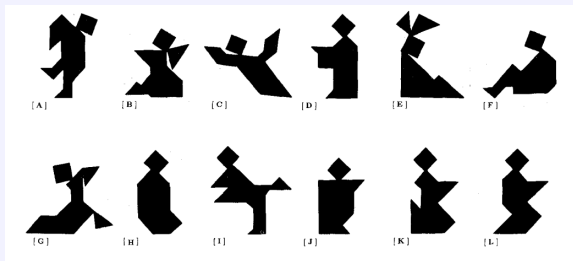
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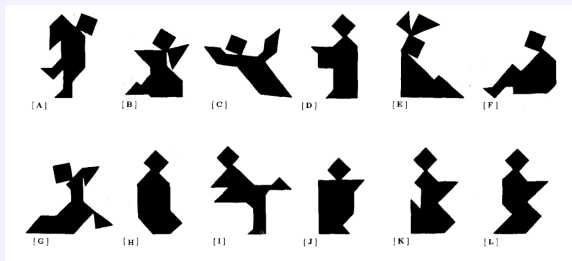
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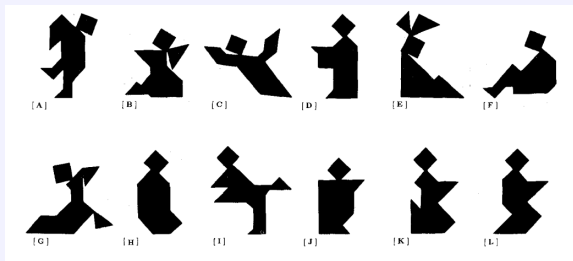
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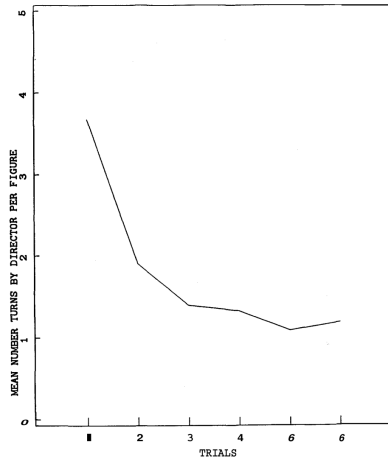
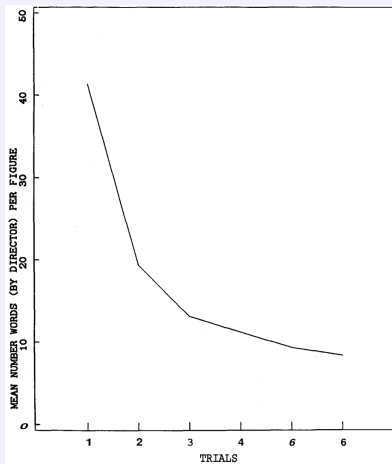
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# Clark & Wilkes-Gibbs 1986



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- ⑥ The ice skater.

# Clark & Wilkes-Gibbs 1986



# Hawkins, Frank, & Goodman 2020

Scaling up with web-based experiments

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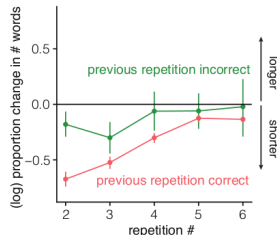
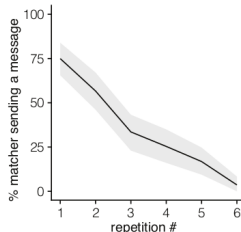
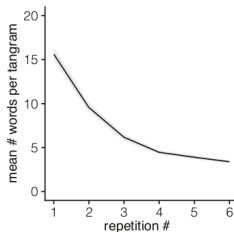
## Scaling up with web-based experiments

- Cued version with feedback on each trial
- Message with a chat box
- After all exclusions, 83 dyads

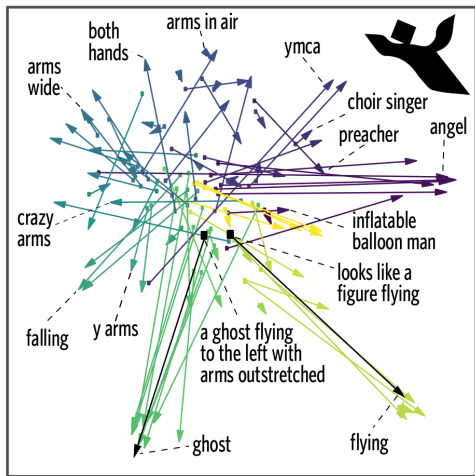
# Hawkins, Frank, & Goodman 2020

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# Hawkins, Frank, & Goodman 2020



Semantics converge within and diverge between groups

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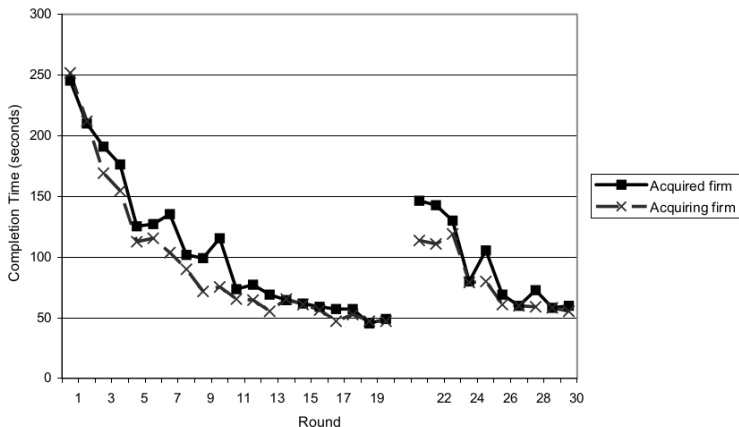
Two speaker/listener pairs train separately

Then 'merger': speaker talks with \*both\* listeners

# Weber & Camerer 2003

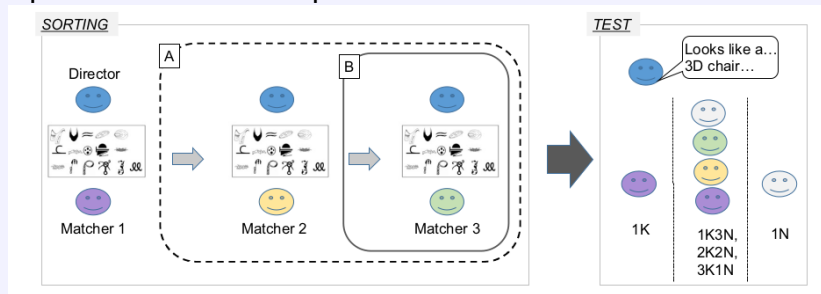
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Then 'merger': speaker talks with \*both\* listeners

Figure 2 Average Completion Times (11 Merger Sessions)



# Yoon & Brown-Schmidt 2019

## Speaker talks to multiple matchers



Examine speaker's utterance length, elaborations, disfluencies

# First Year Project

Dynamics of alignment in larger groups



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Compare groups of 2/3/4 communicators

- Look for differential reduction

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Rotate who is the knowledgeable speaker

- Chosen for participant experience
- Stronger measure of alignment

# Experiment Framework

Implemented in Empirica (Almaatouq et al 2020)

Round 1 / 6 > Target 1 / 12













 Laju (You)  Repi (Listener)  Minu (Listener)

Timer  
**01:43**

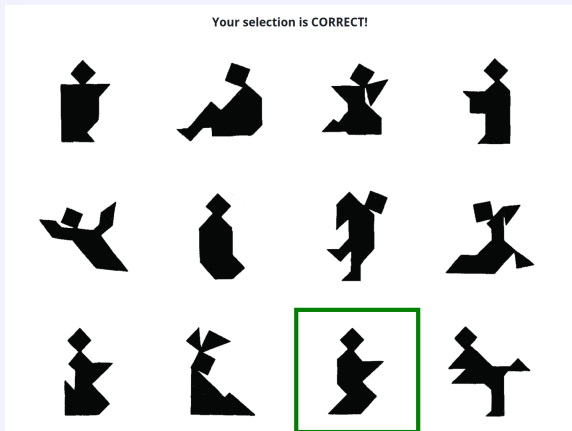
Score  
**\$0.00**

No messages yet...

You are the speaker. Please describe the picture in the box to the other players.

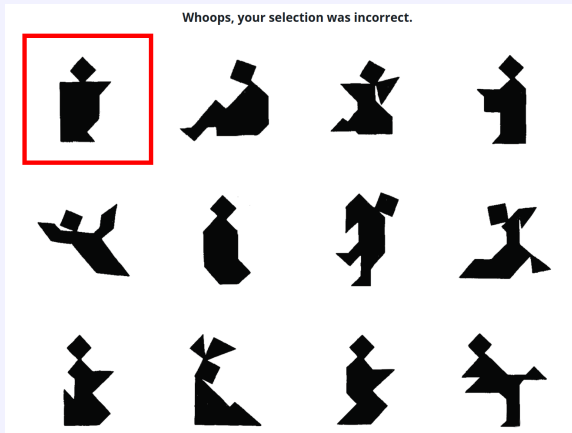
			
			
			

# Experiment Framework



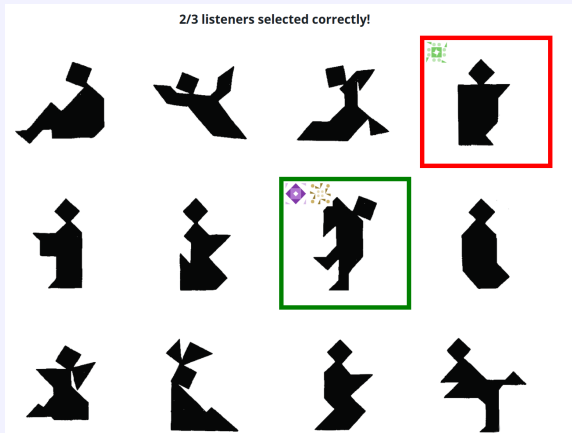
Bonus: 4 points

# Experiment Framework



Bonus: 0 points

# Experiment Framework



Bonus: Average of listeners =  $(2/3) * 4$  points

# Recruitment

Goal: 20 games in each of 2/3/4-player conditions  
Each game has 6 blocks of 12 tangrams

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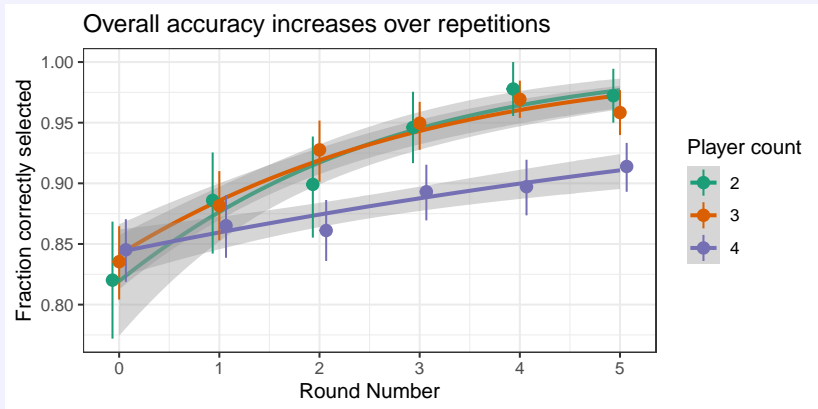
Actual recruitment:

- 15 2-player games (+ 4 partial)
- 18 3-player games (+ 2 partial)
- 20 4-player games (+ 1 partial)

Include all complete blocks

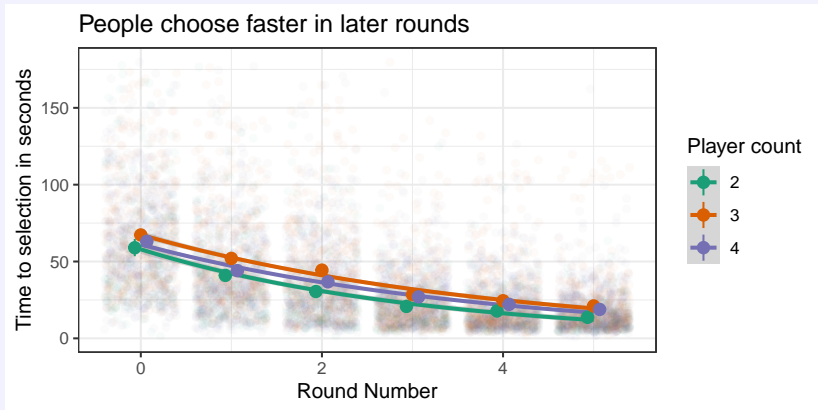


# Results – Accuracy



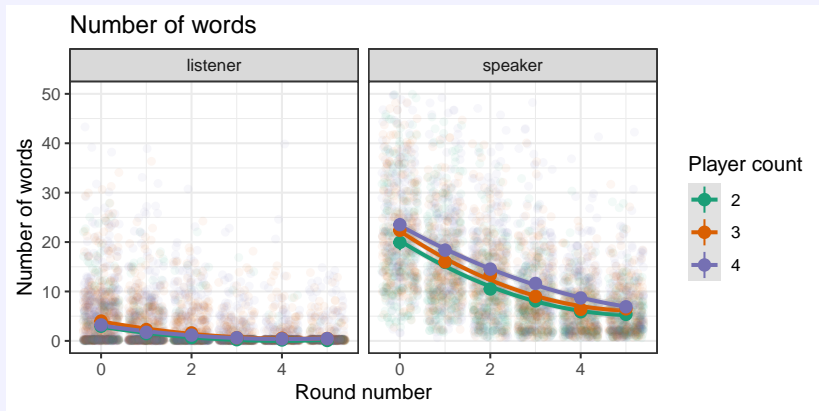
Accuracy is high and increasing

# Results – Speed



Listeners choose faster in later rounds

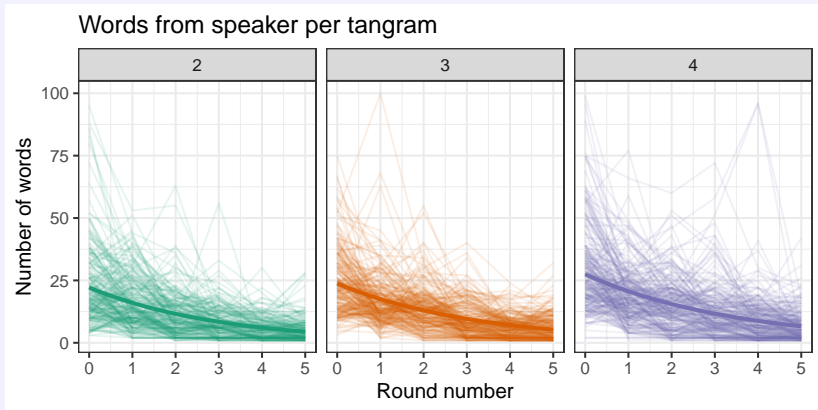
# Reduction



Number of words reduces over rounds

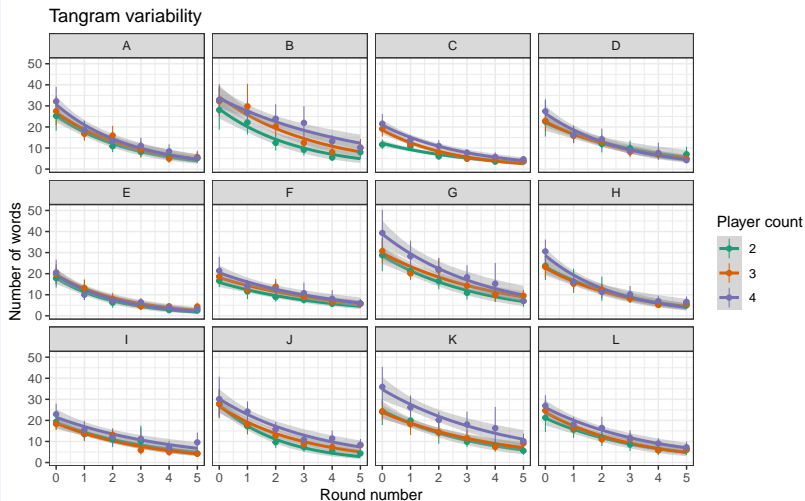
Caution: Non-referential utterances not yet removed

# Reduction



Variability

# Reduction



Tangrams vary in nameability

# Planned Analyses

- Remove chit-chat, model reduction
- Semantic convergence in games
- Impact of speaker accuracy

# Possible future directions

Understand how references are formed more generally

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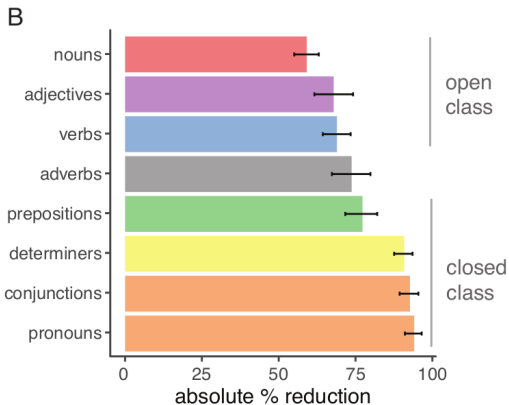
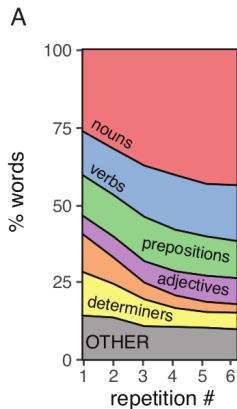
- Different target images
- Curriculum learning
- Larger groups

# Comments, Questions?

Looking for feedback on

- What analyses would be interesting?
- What's the next study?

# Hawkins, Frank, & Goodman 2020



Words tend to drop out in syntactic units