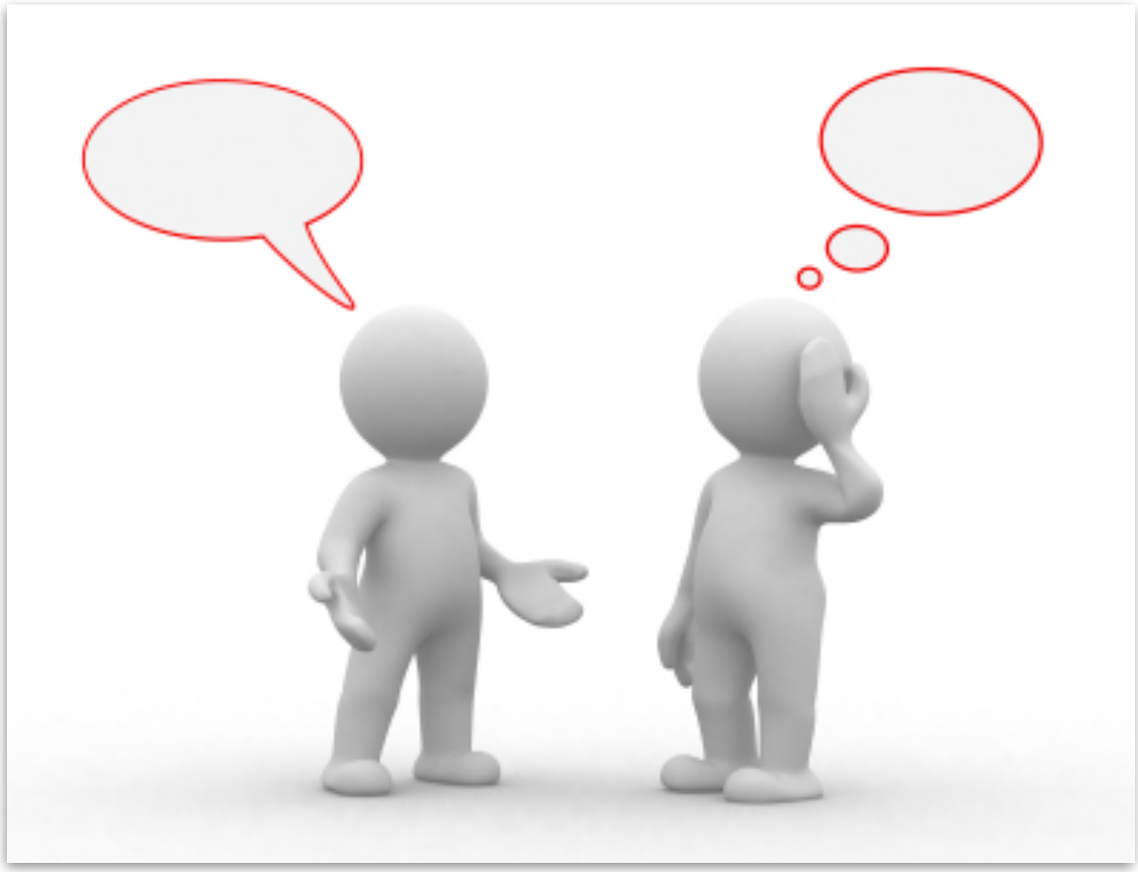
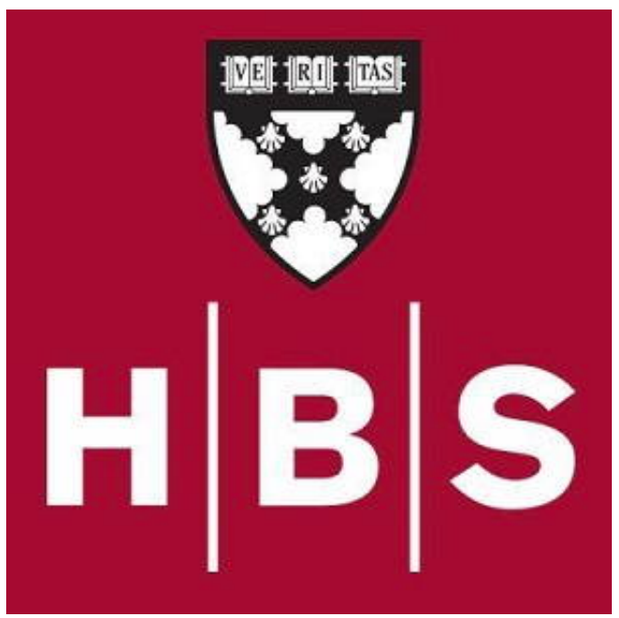
Managing Topics of Conversation

Michael Yeomans
&
Alison Wood Brooks





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Conversation is... a rich skillset

(Zajonc, 1960; Grice, 1975; Frank & Goodman, 2012; Pickering & Garrod, 2004a; 2004b; Misyak et al., 2014)

Managing Topics of Conversation

Conversation is... a rich skillset
full of hard choices

(Crawford & Sobel, 1982;
Lerner & Tetlock, 1999; Berger, 2014)

Managing Topics of Conversation

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Follow-Up Question-Asking

It doesn't hurt to ask... *(JPSP, 2017)*
It still doesn't hurt to ask... *(JPSP, 2019)*

(w/ Karen Huang, Alison Wood Brooks, Julia Minson & Francesca Gino)

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Both Studies

- 15 min open-ended conversations
- Strangers paired in dyads over ChatPlat
- Intervention: question-asking instructions

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Study 1

- 398 Behavioral Lab Participants (199 dyads)
- One partner is told to ask many/few questions
- Other partner given no instructions

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Study 1

- 398 Behavioral Lab Participants (199 dyads)
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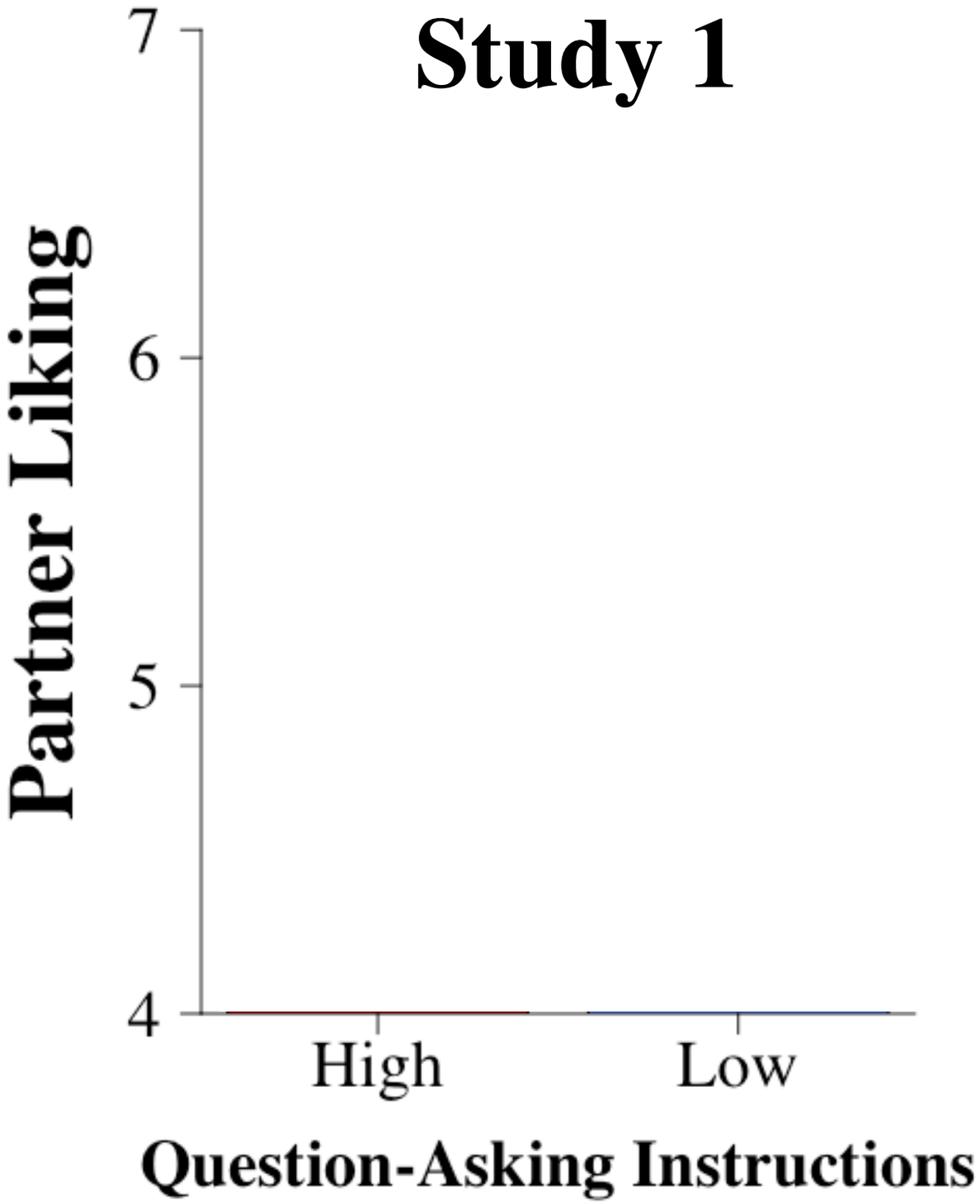
Study 2

- 338 mTurk Participants (169 dyads)
- Both participants told to ask many/few questions (2x2)

Main Effect of Question-Asking



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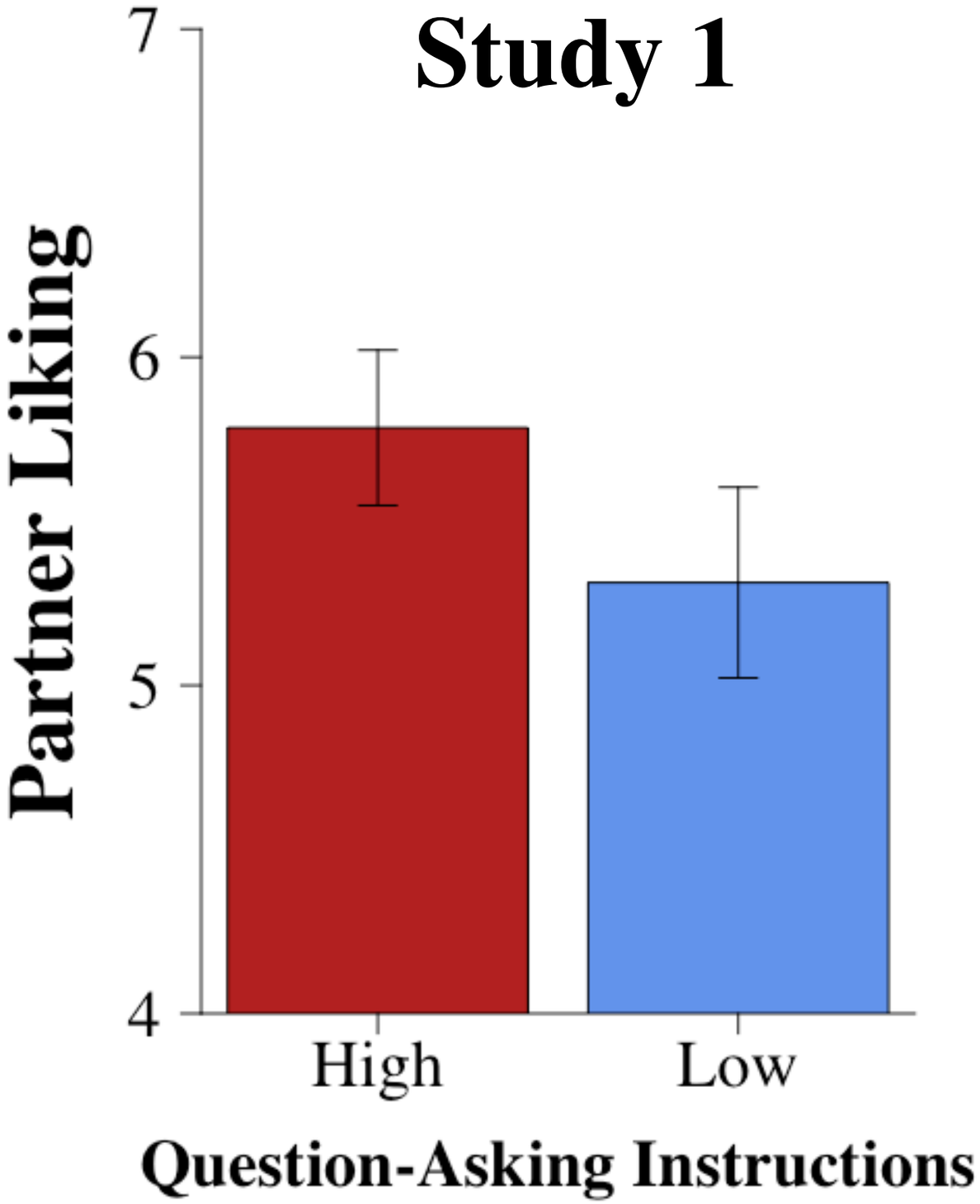

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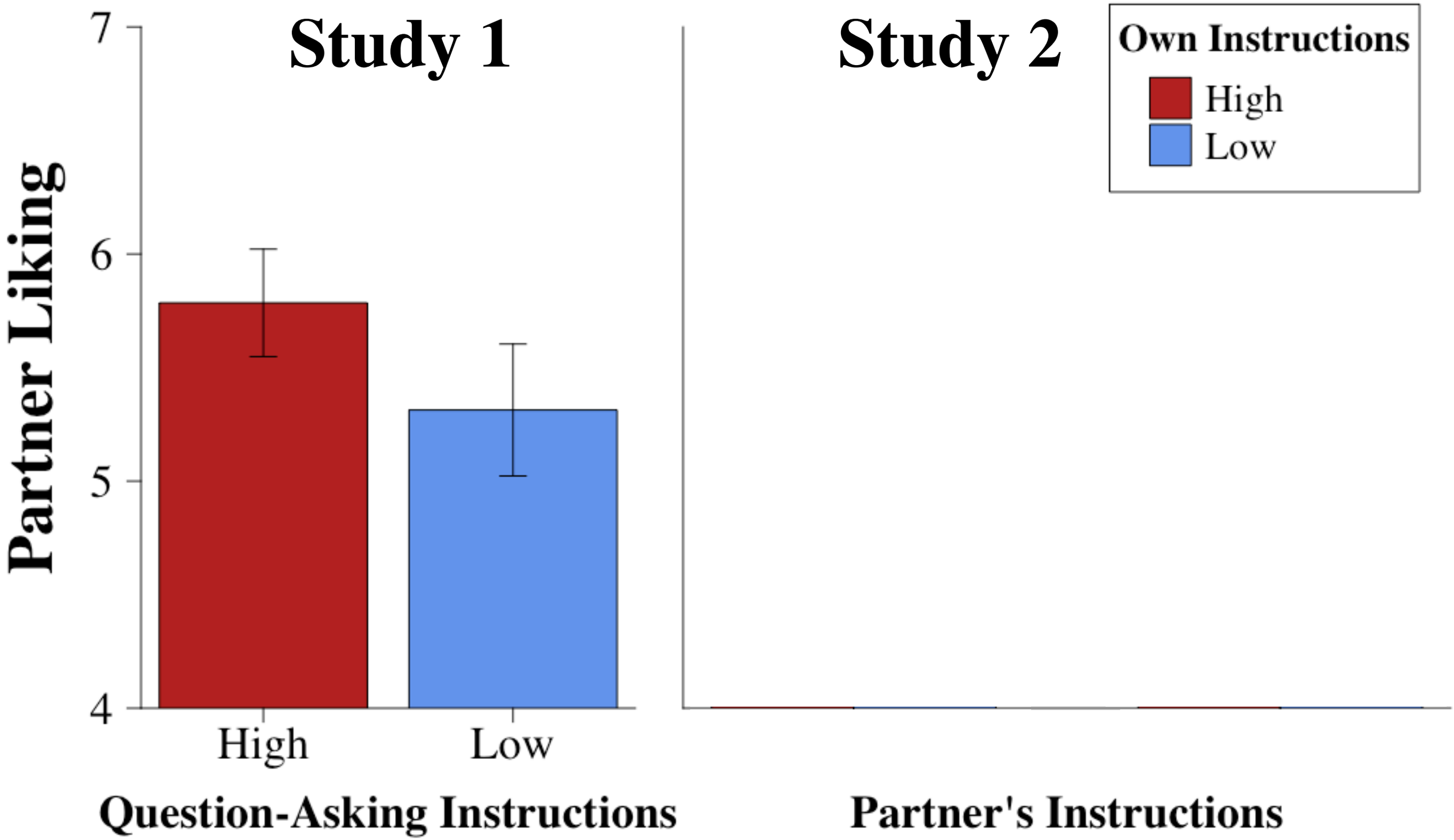

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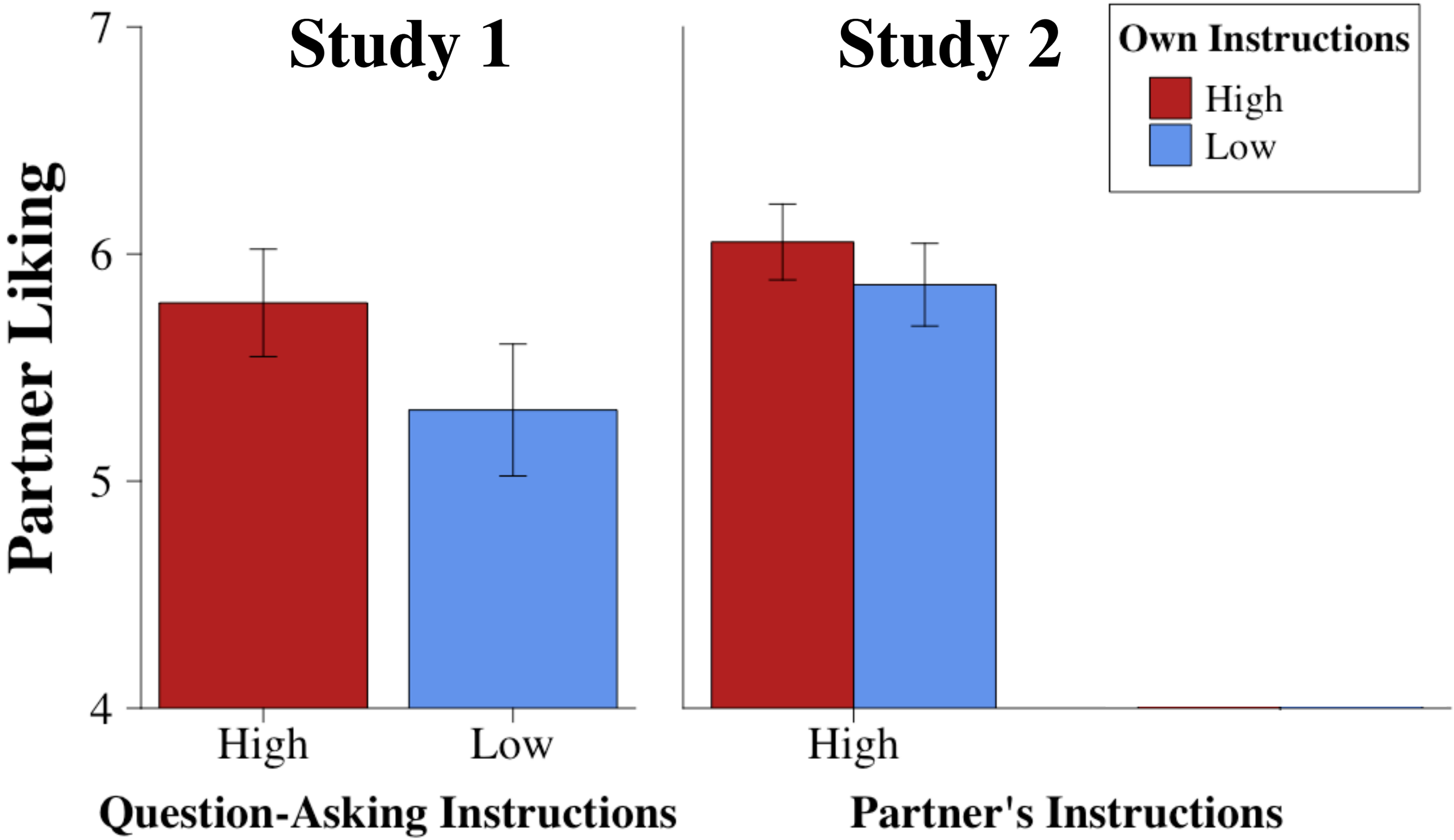

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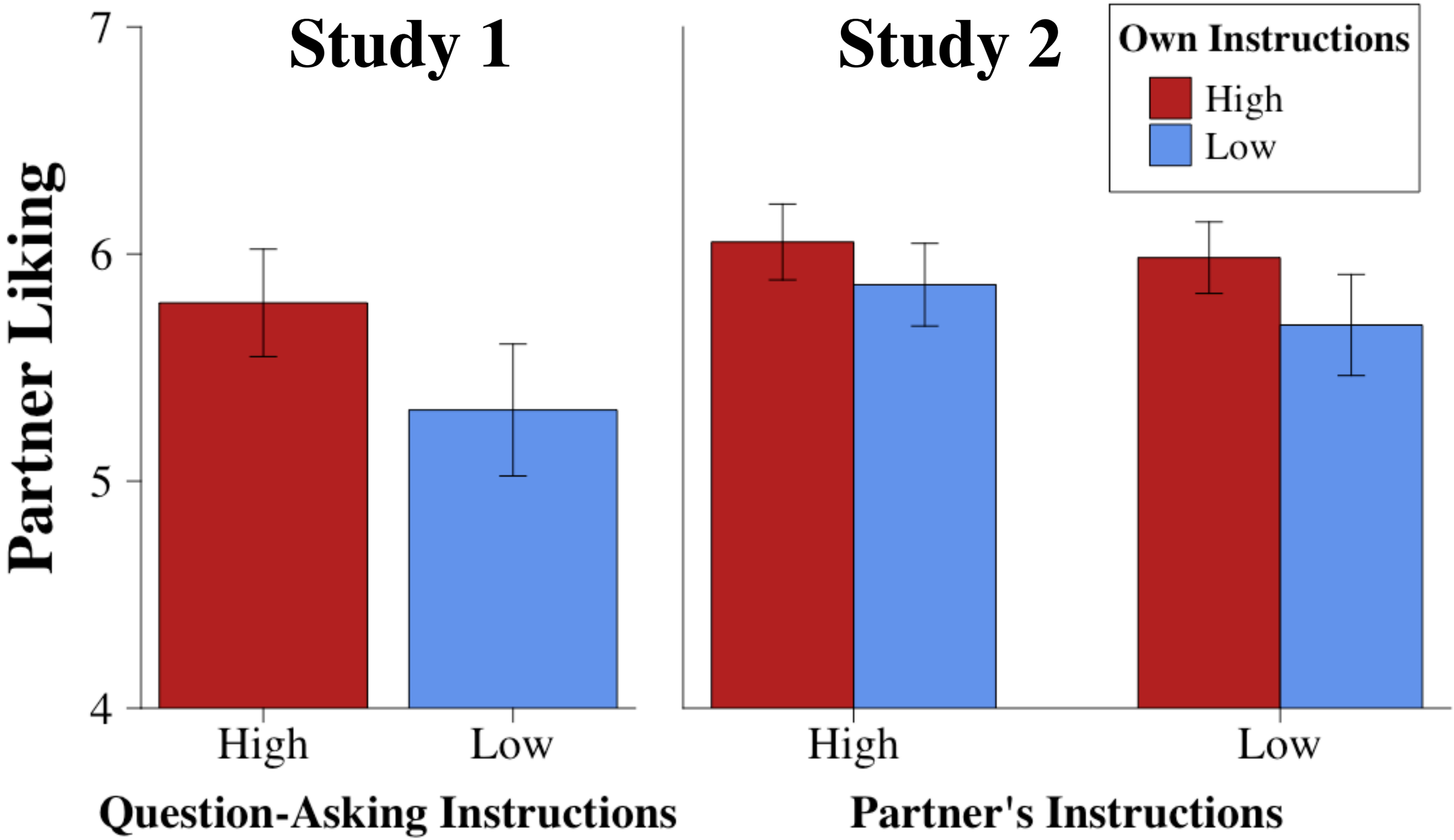

Typology of Question-Asking

Question	Example from Study 1	α	Q%
Follow-Up	Person 1: I'm planning a trip to Canada. Person 2: Oh, cool. **Have you been there before?**	**.87**	**40.5%**
Full Switch	Person 1: I am working at a dry cleaners. Person 2: **What do you like doing for fun?**	**.86**	**27.6%**
Partial Switch	Person 1: Not super outdoorsy, but not opposed to a hike or something once in awhile. Person 2: **Have you been to the beach in Boston?**	.47	5.5%
Mirror	Person 1: What did you have for breakfast? Person 2: I had eggs and fruit. **How about you?**	**.94**	**19.0%**
Introductory	Person 1: hello! Person 2: **Hey, how's it going?**	**.93**	**5.8%**
Rhetorical	Person 1: What's the craziest event you've been to? Person 2: Yesterday I followed a marching band around. **Where were they going?** It's a mystery.	.74	1.9%

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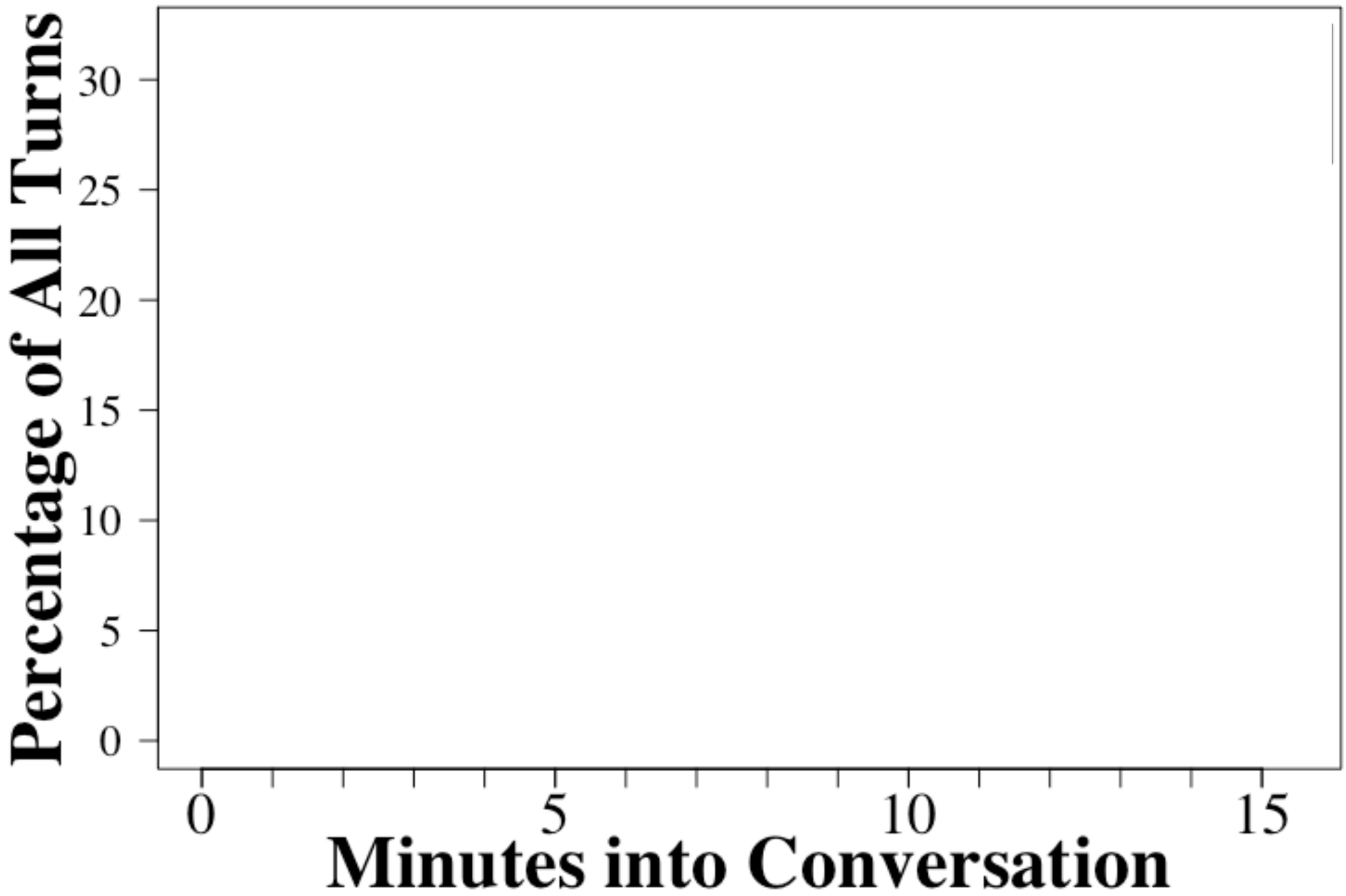
Time Course of Question-Asking



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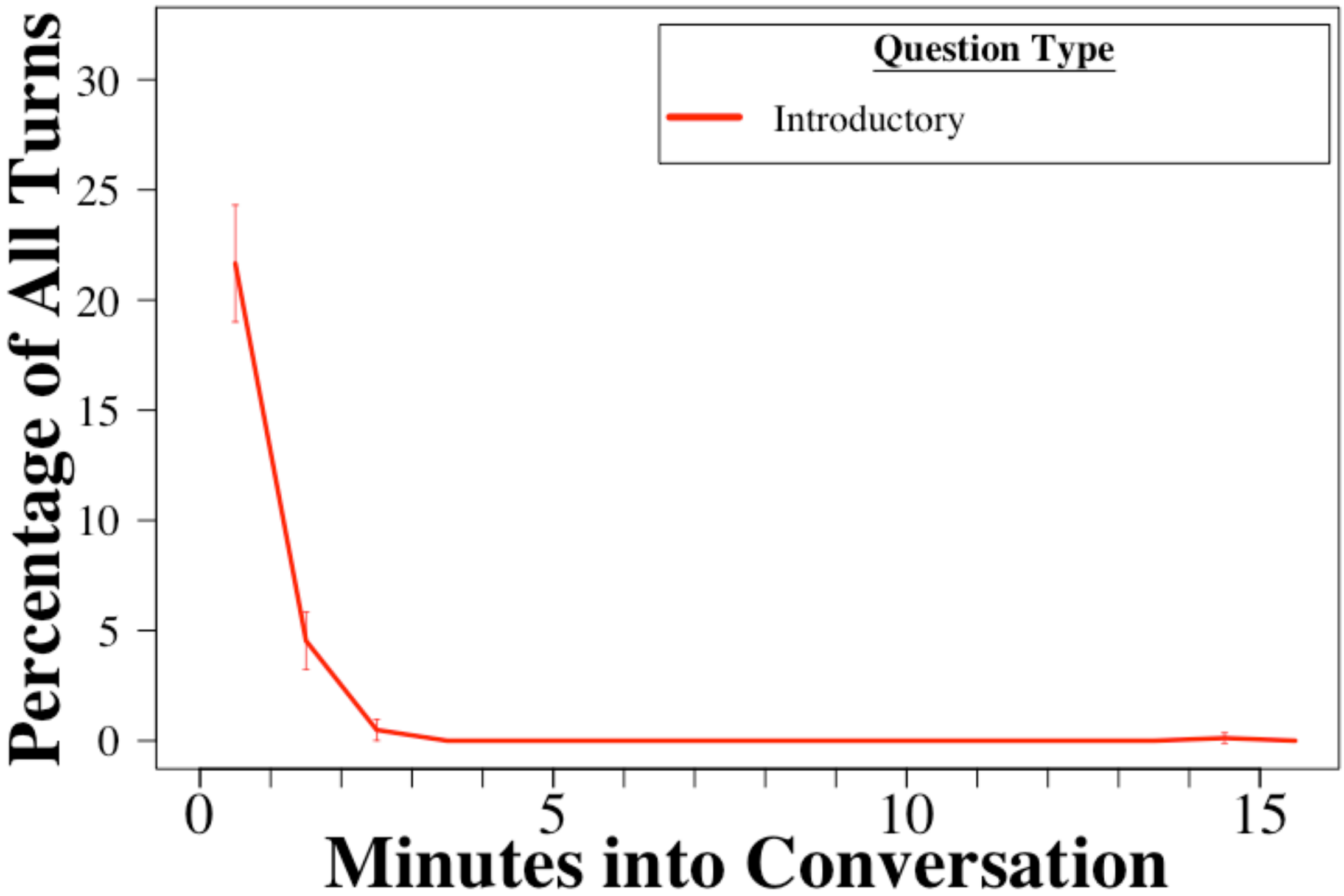

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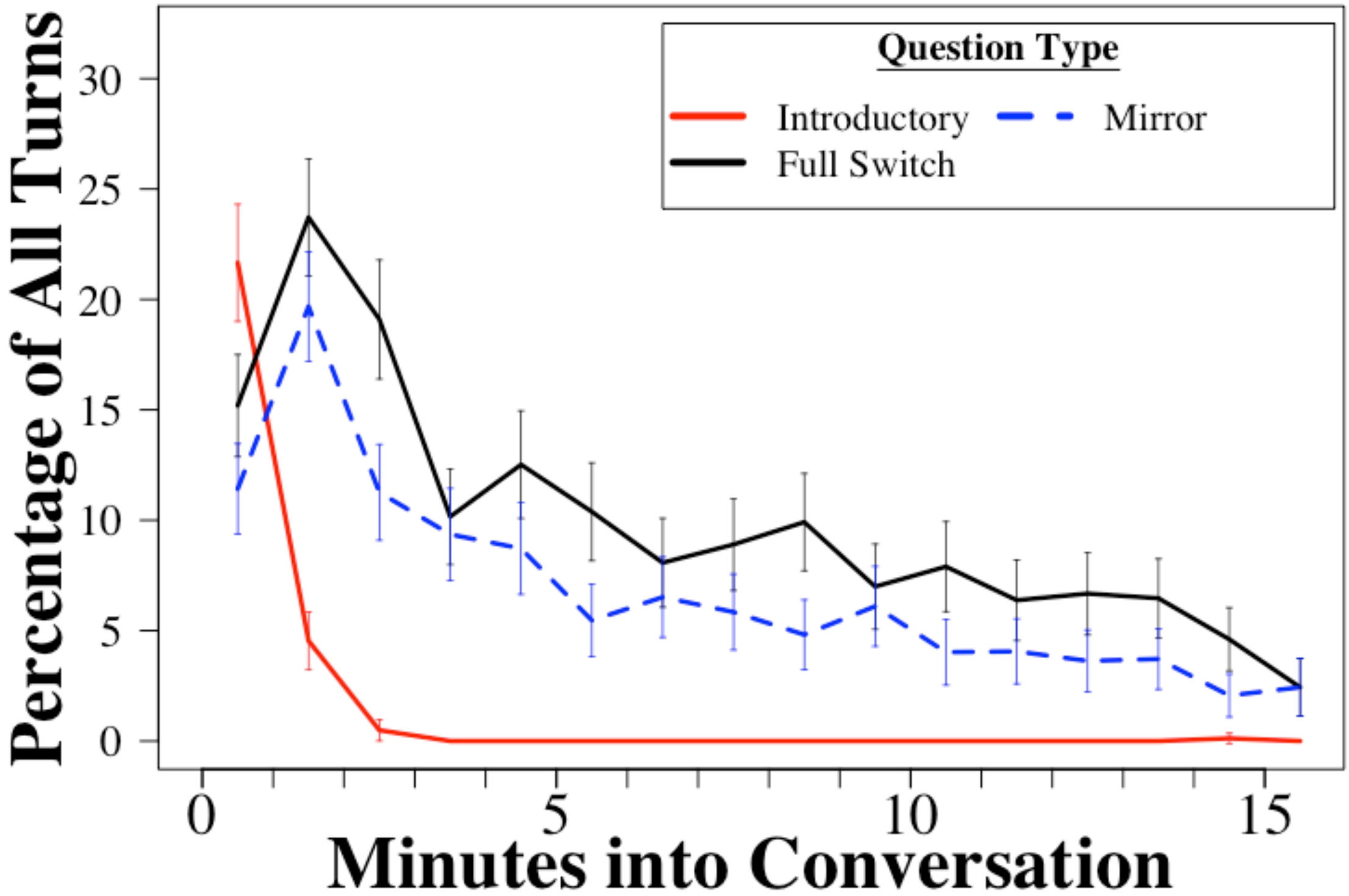

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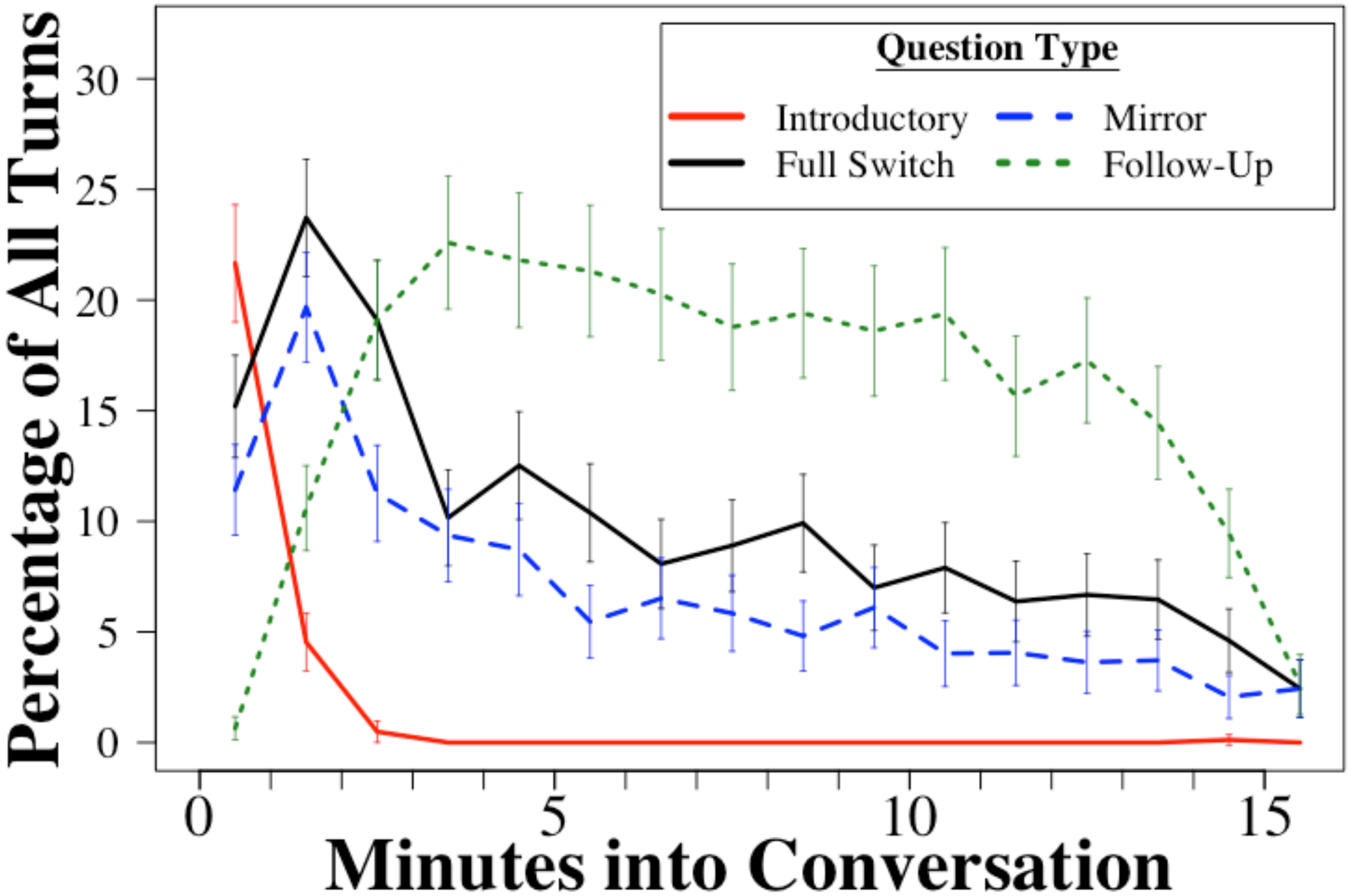

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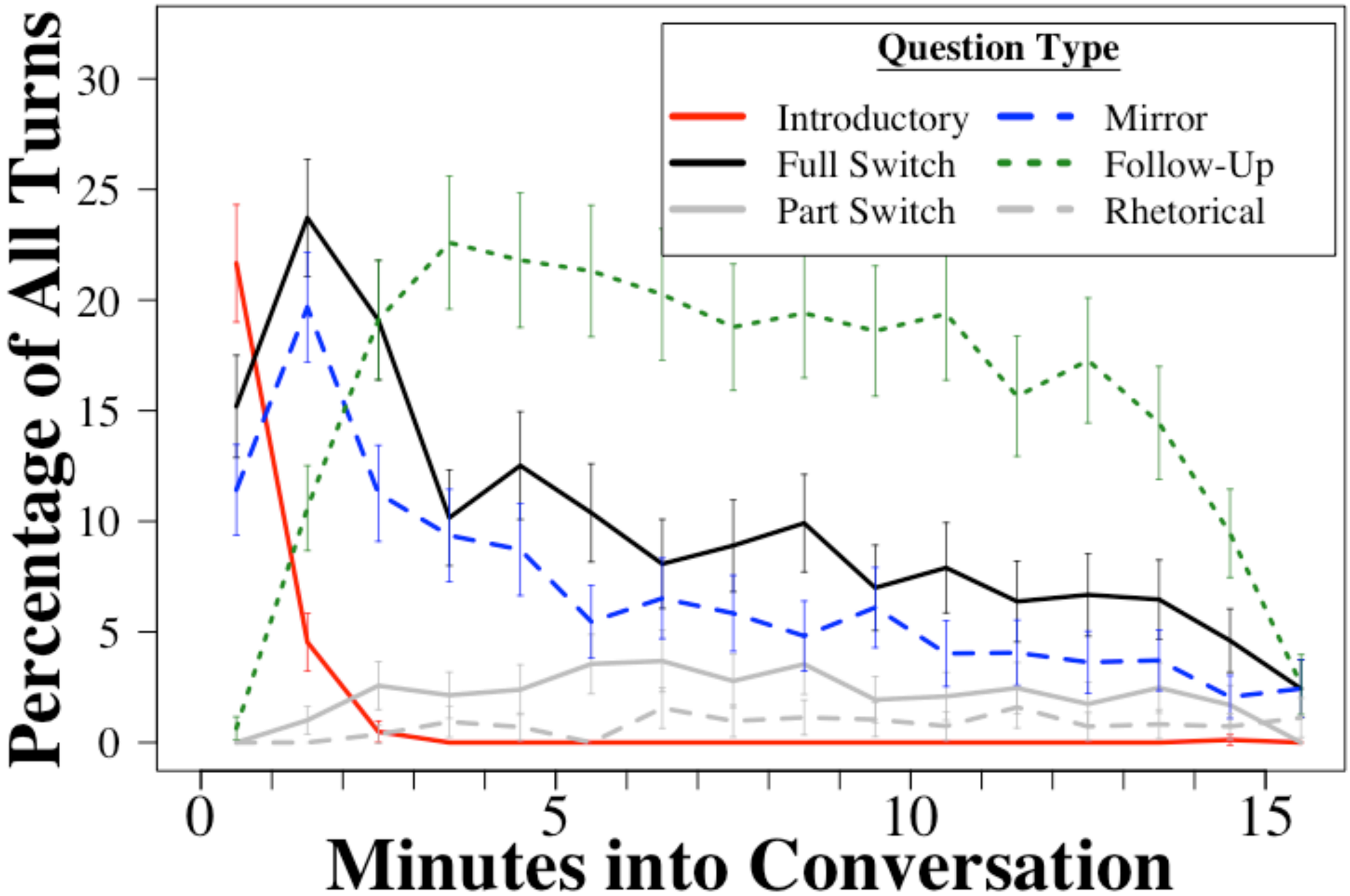

Distinctive Question Features

Contextual Feature	Follow-Up	Switch	Intro	Mirror
Word Count of turn				
Time into Conversation				
Question in askee's last turn				
Question in asker's last turn				
Multiple questions in the turn				
Pre-question statement in turn				

Distinctive Question Features

Contextual Feature	Follow-Up	Switch	Intro	Mirror
Word Count of turn	**.20**	—	—	—
Time into Conversation	**.25**	—	**-1.34**	—
Question in askee's last turn	—	—	**-.43**	**.61**
Question in asker's last turn	**.30**	**.12**	**-.33**	**-.12**
Multiple questions in the turn	**.08**	**-.04**	—	—
Pre-question statement in turn	**-.10**	—	—	**.37**

Distinctive Question Features

Follow-up	Switch	Introductory	Mirror
which	how old	how are you	how about
why	do you like	hello	what about
what kind	travel	your name	yourself?
cool	fun	how are	and
nice	do you live	hi how	i am
wow	interests	today?	and you
is it	hobbies?	what is	what about you
how do	you a student	go?	and
where do	weather	name?	no, i
want to	you from?	are you?	yes, i

Question Type Detector Accuracy

		Human Label of Question			
		Follow-up	**Switch**	**Introductory**	**Mirror**
Machine Label of Question	**Follow-up**	1377	358	7	99
	Switch	373	806	30	139
	Introductory	2	17	202	18
	Mirror	89	71	12	609

Question Type Detector Accuracy

Accuracy = 87.0%

95%CI: [86.0,88.0]

		Human Label of Question			
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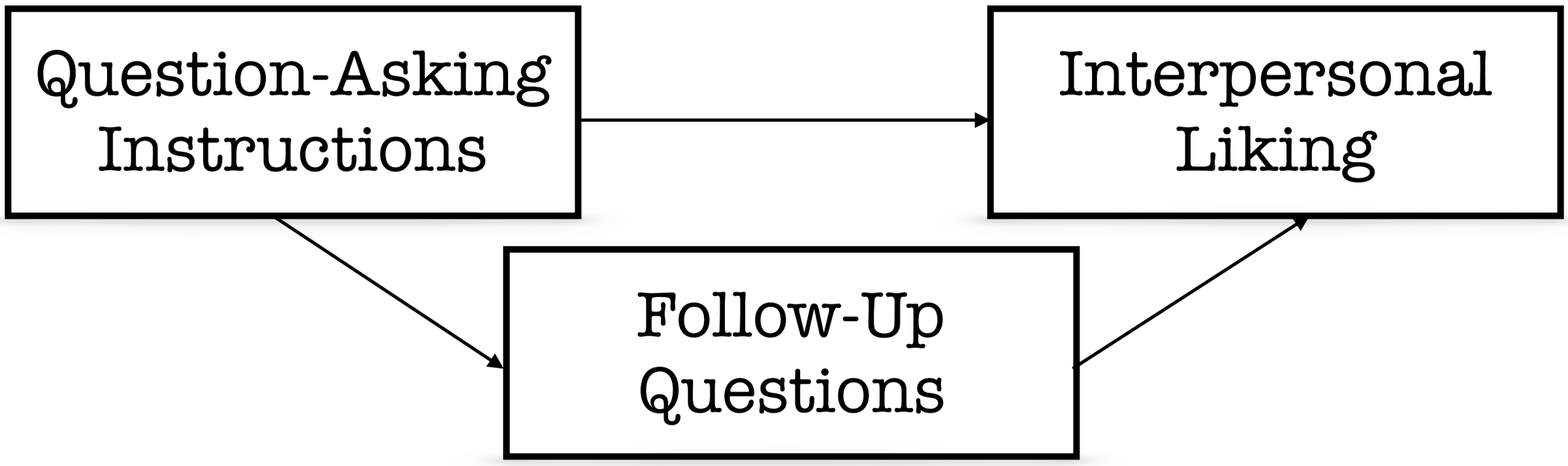
Machine Label of Question	**Follow-up**	**1377**	358	7	99
	Switch	373	**806**	**30**	**139**
	Introductory	2	**17**	**202**	**18**
	Mirror	89	**71**	**12**	**609**

How does Question-Asking Increase Liking?



Bootstrapped indirect effect (both studies)

Standardized β = .412, 95% CI = [.071,1.11]

Follow-Up Questions in the Field

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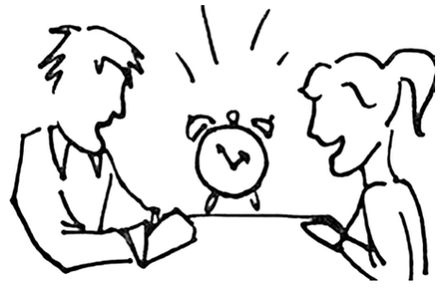
Speed Dating
(Ranganath et al., 2009)



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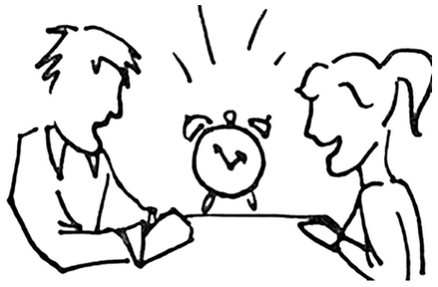

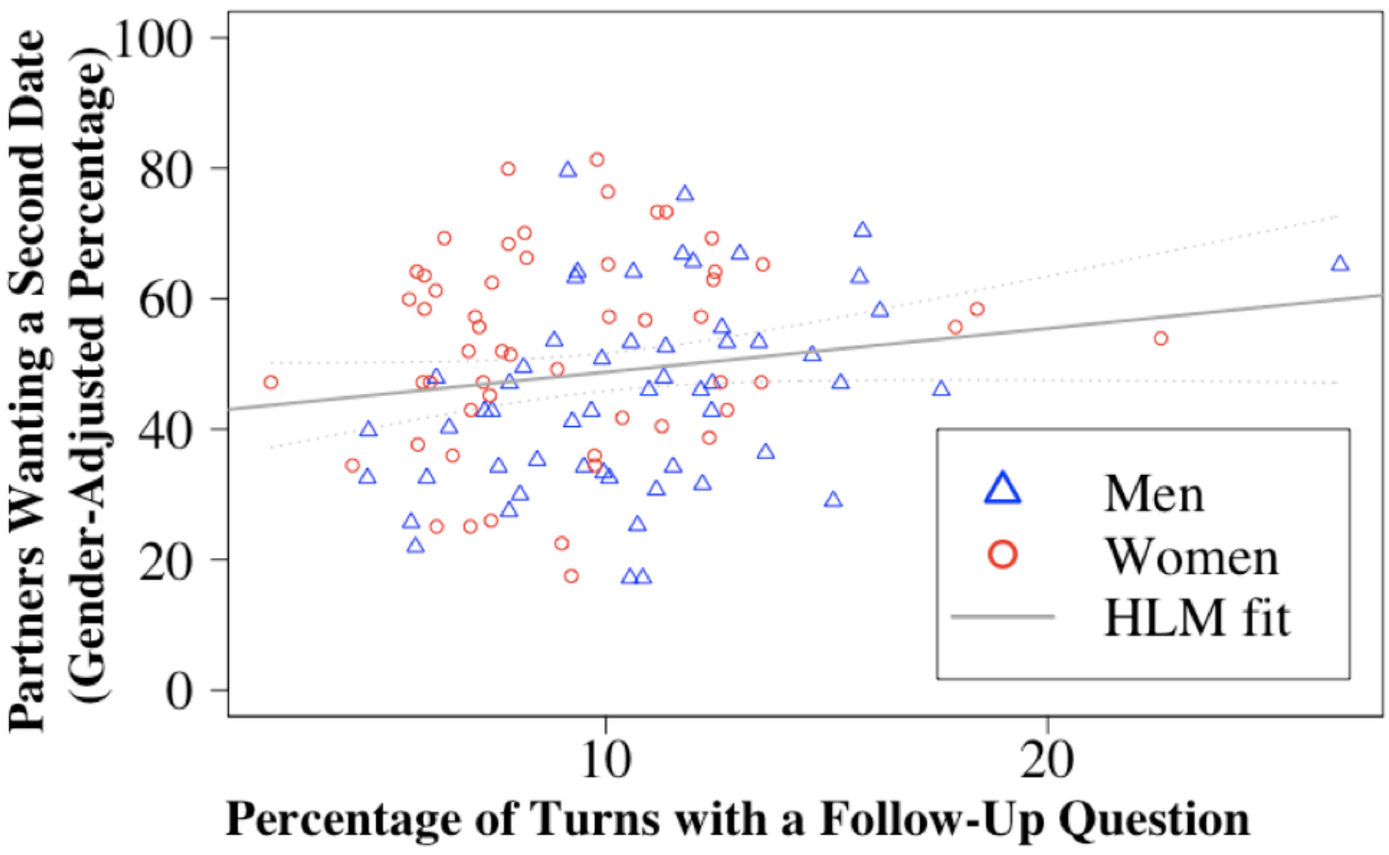

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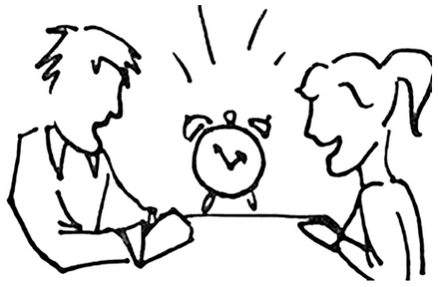
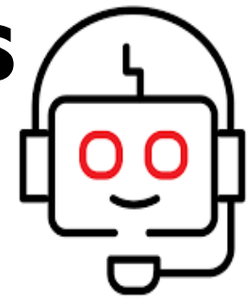
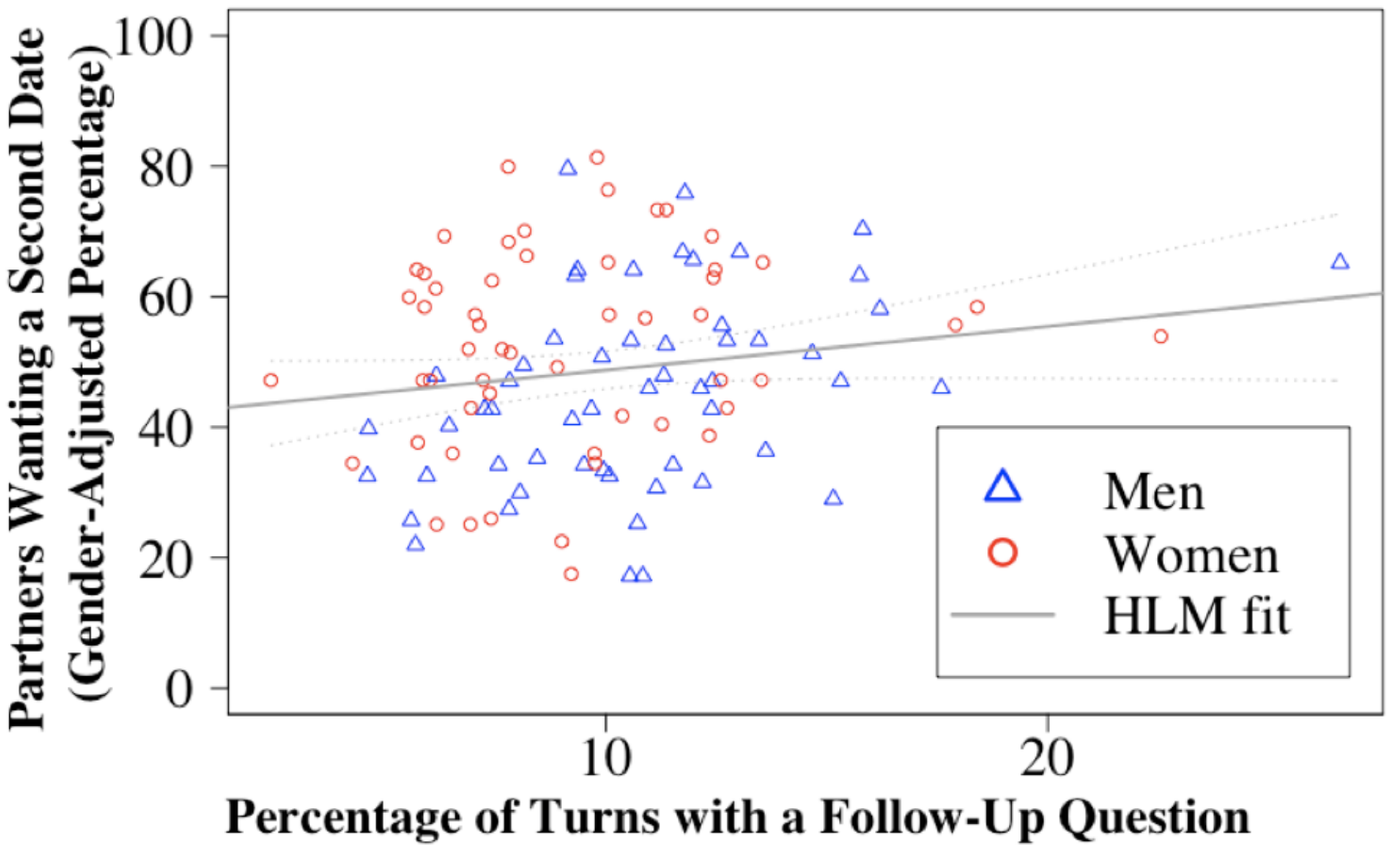


Social ChatBots
(Dinan et al., 2019)





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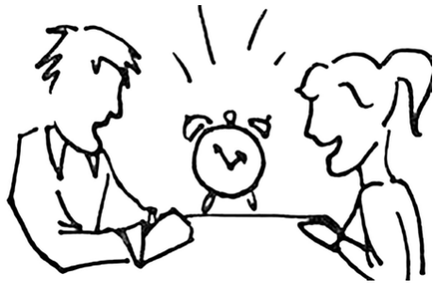

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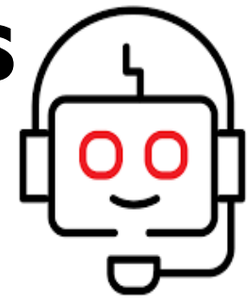

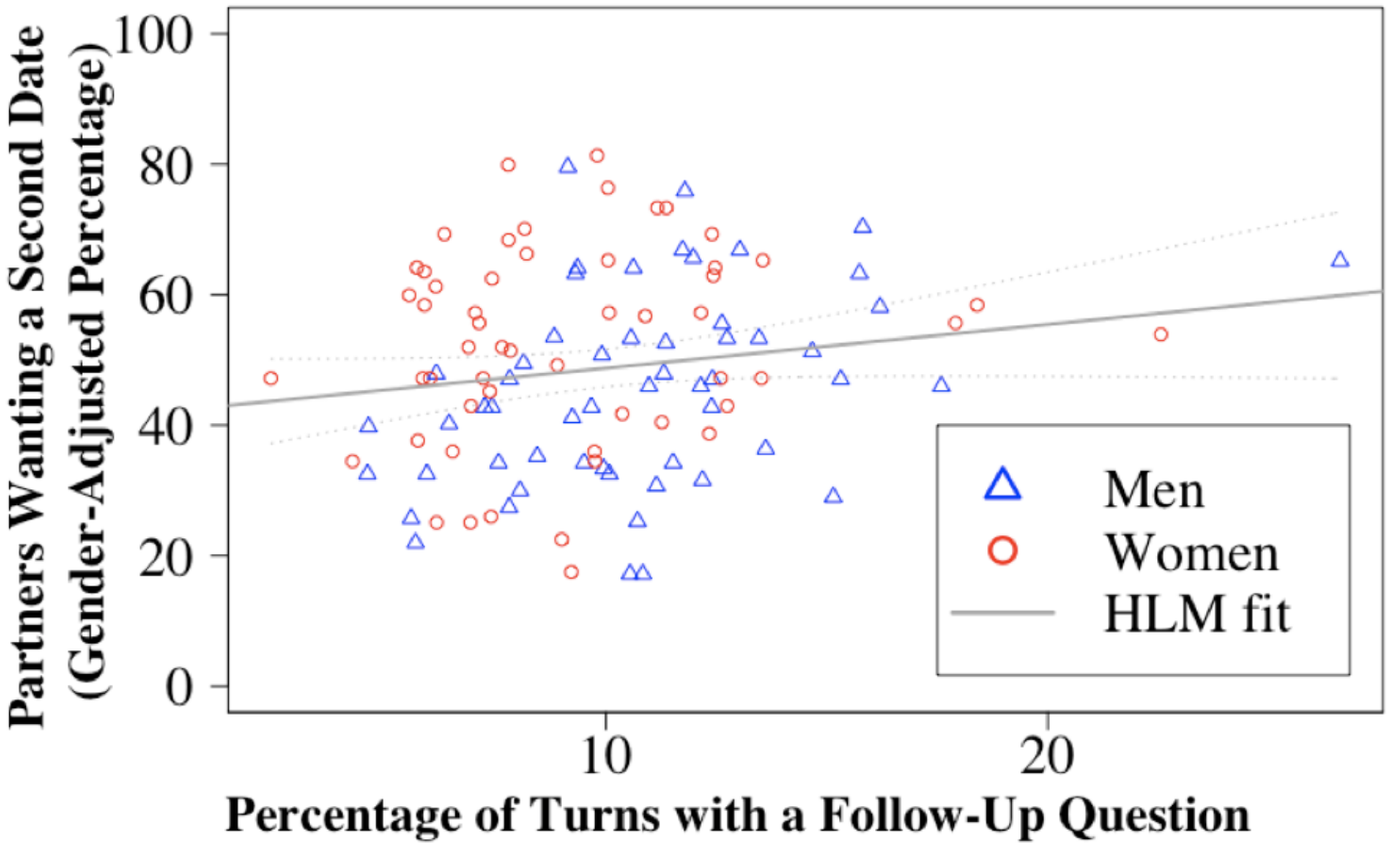

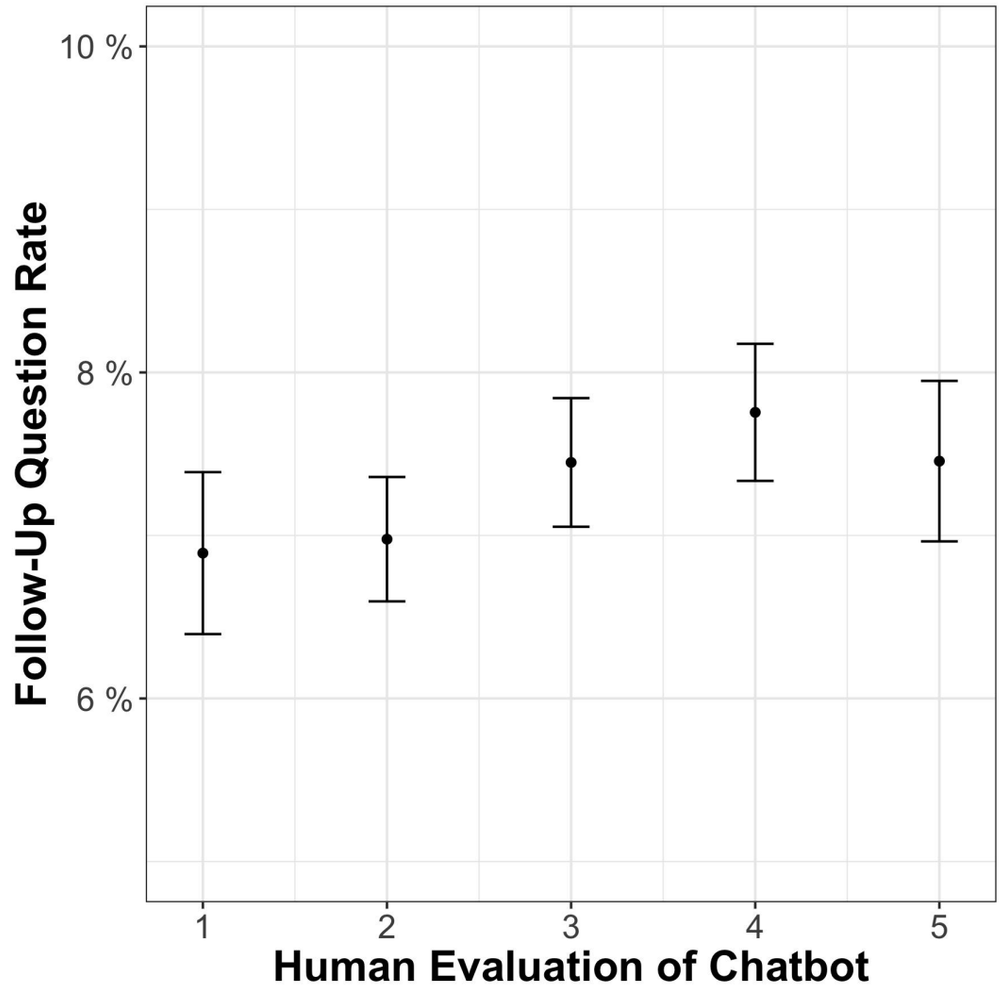

Follow-Up Future Directions

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Content-aware detection

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Content-aware detection

Machine follow-up generation

Follow-Up Future Directions

Content-aware detection

Machine follow-up generation

Human follow-up generation

(w/ Molly Moore & Julia Minson)

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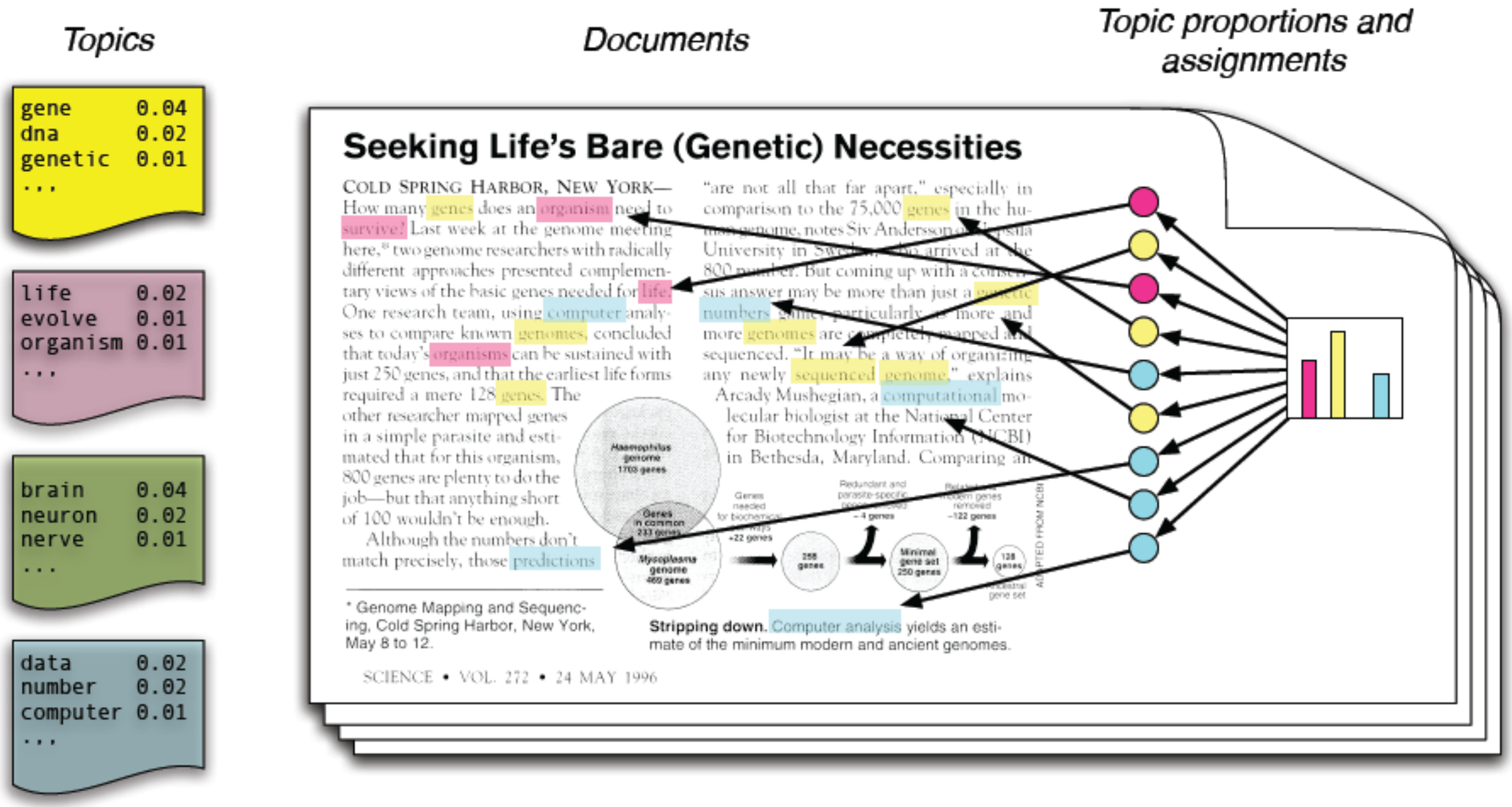
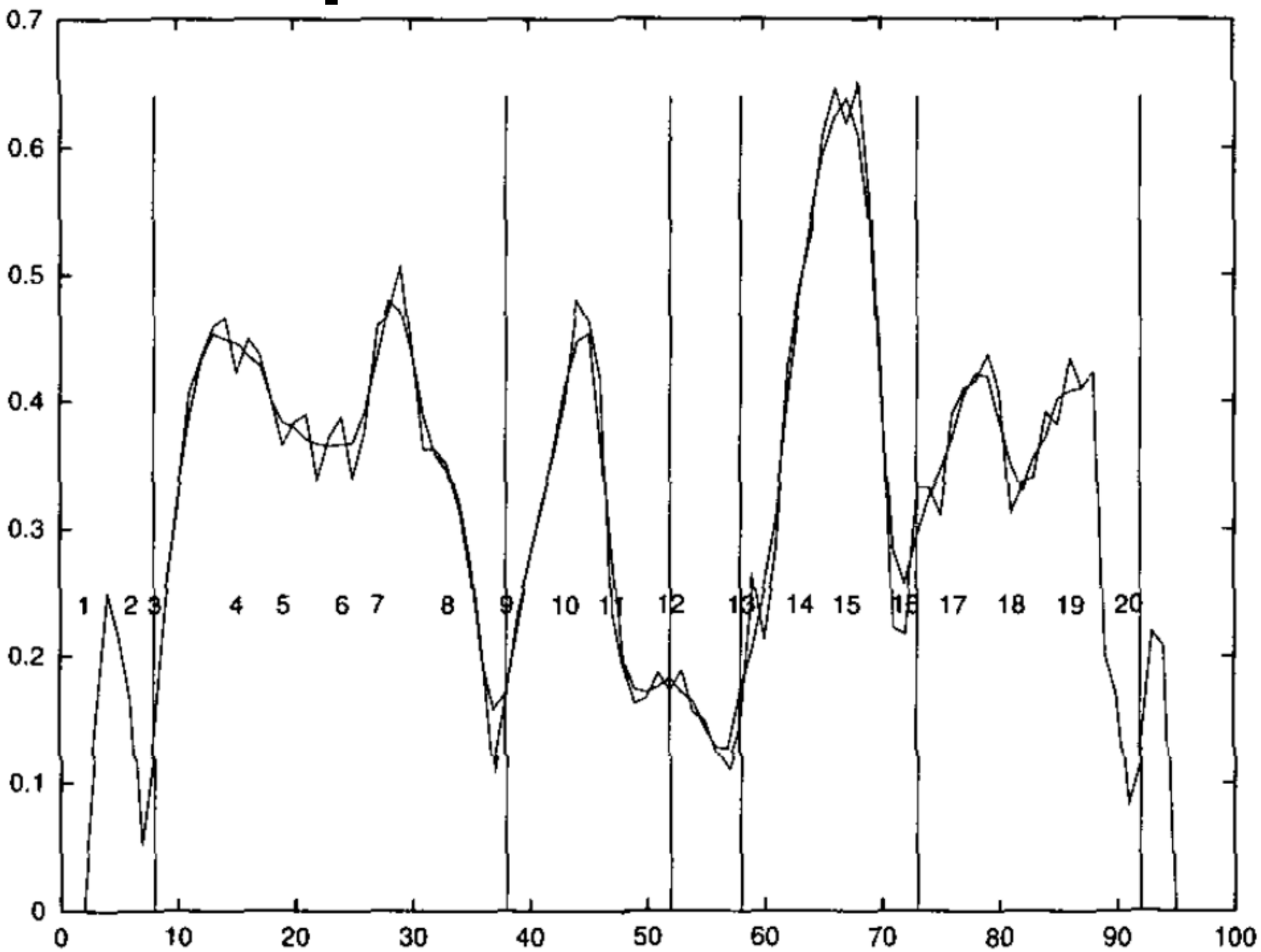
The Topic of Conversation

Topic Detection



(Blei, Ng & Jordan, 2003; Blei & Lafferty, 2007)

Topic Detection



(Sacks, Schegloff & Jackson, 1979; Hardin & Higgins, 1996; **Hearst, 1997;** Passonneau & Litman, 1997; Drew & Holt, 1998; Galley et al., 2003; Schegloff, 2007; Nguyen et al., 2014)

Topic Selection: Theory

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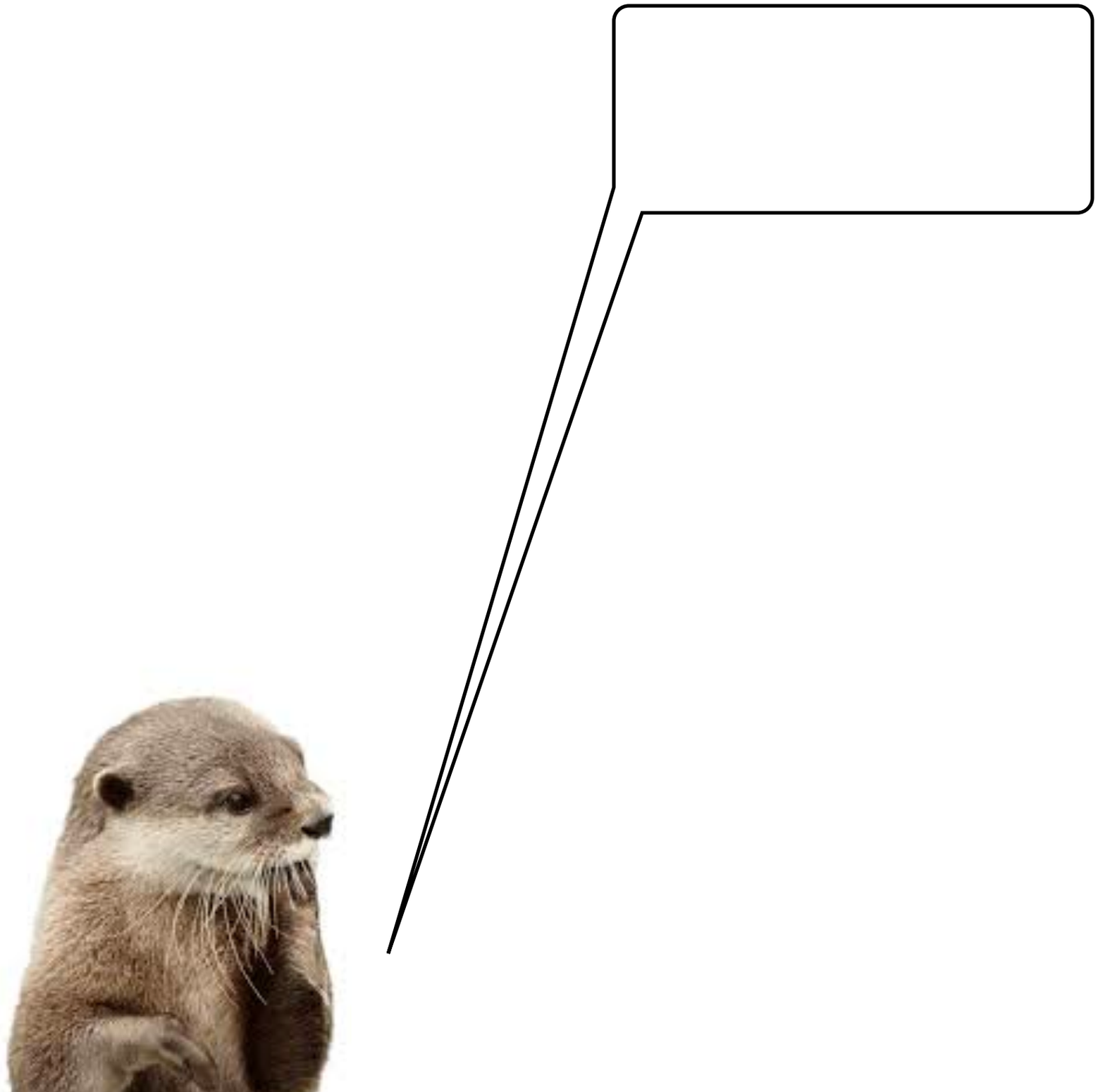

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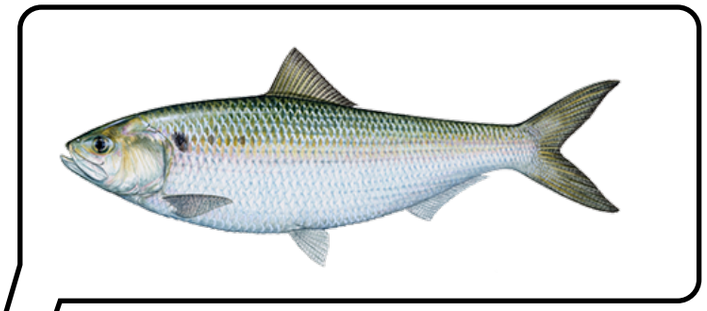

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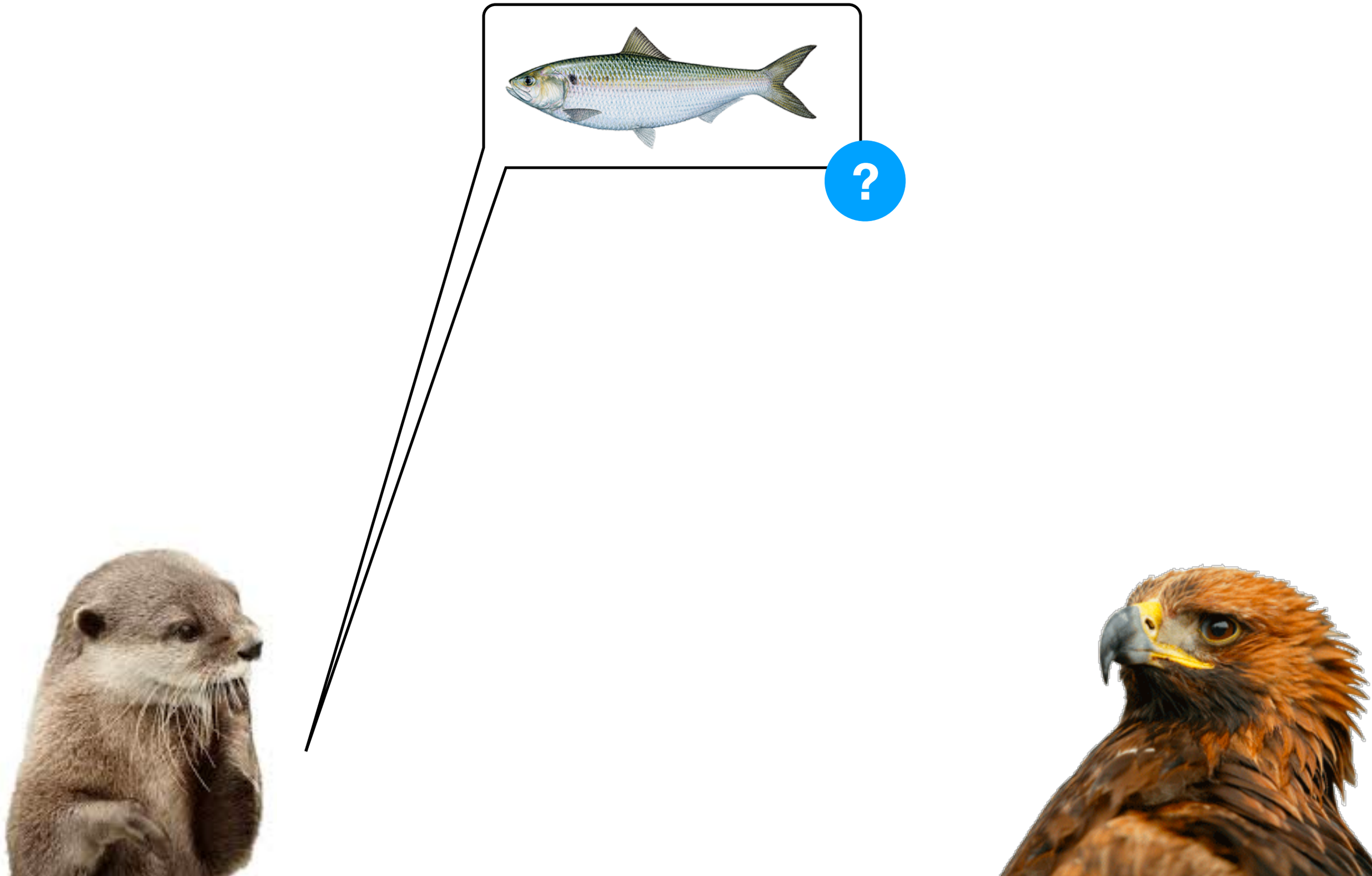

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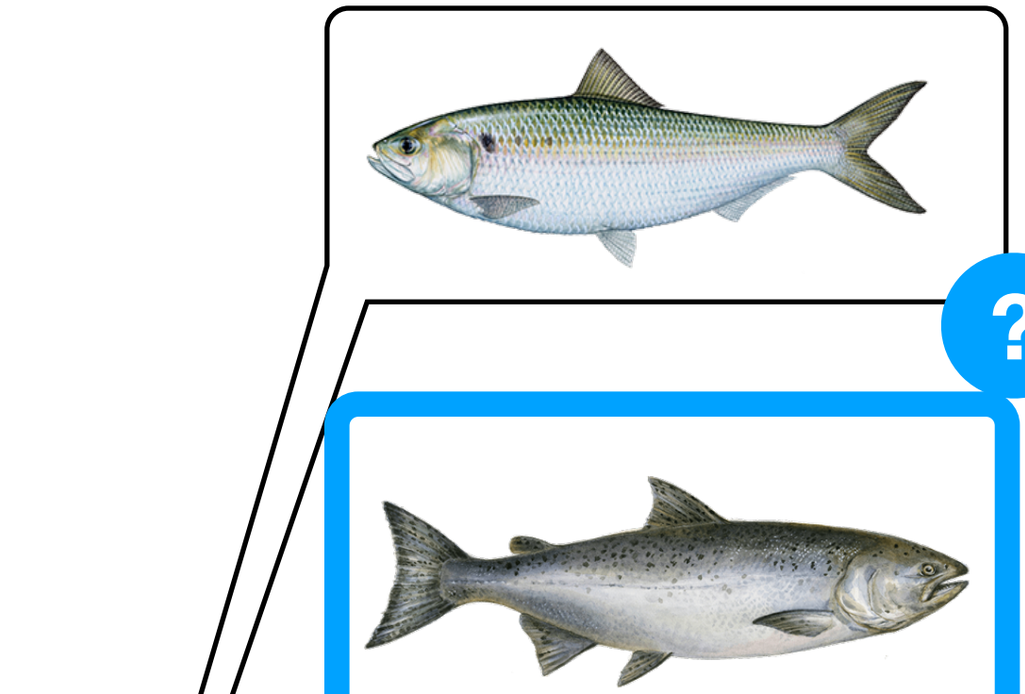
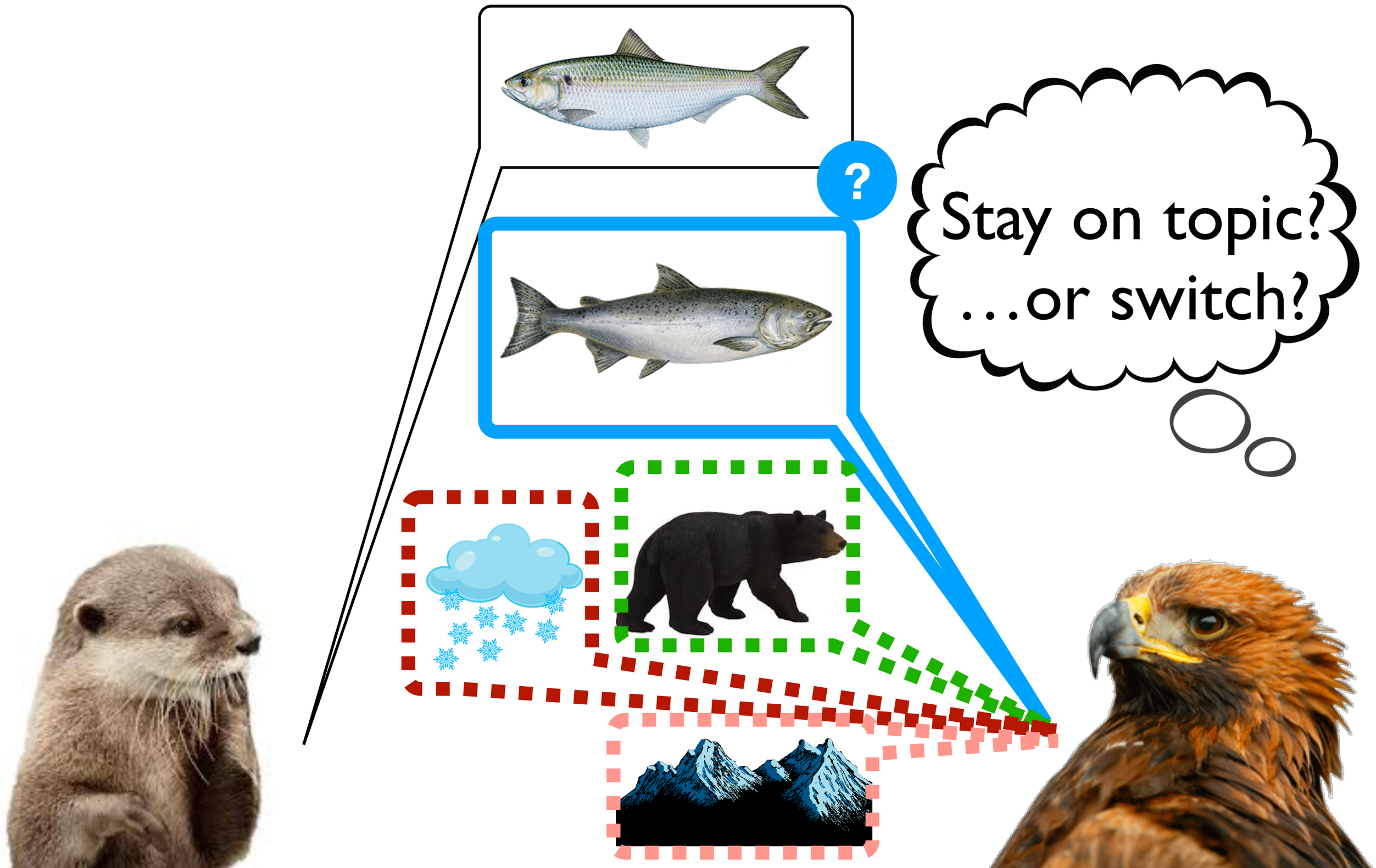


?

Stay on topic?

Topic Selection: Theory



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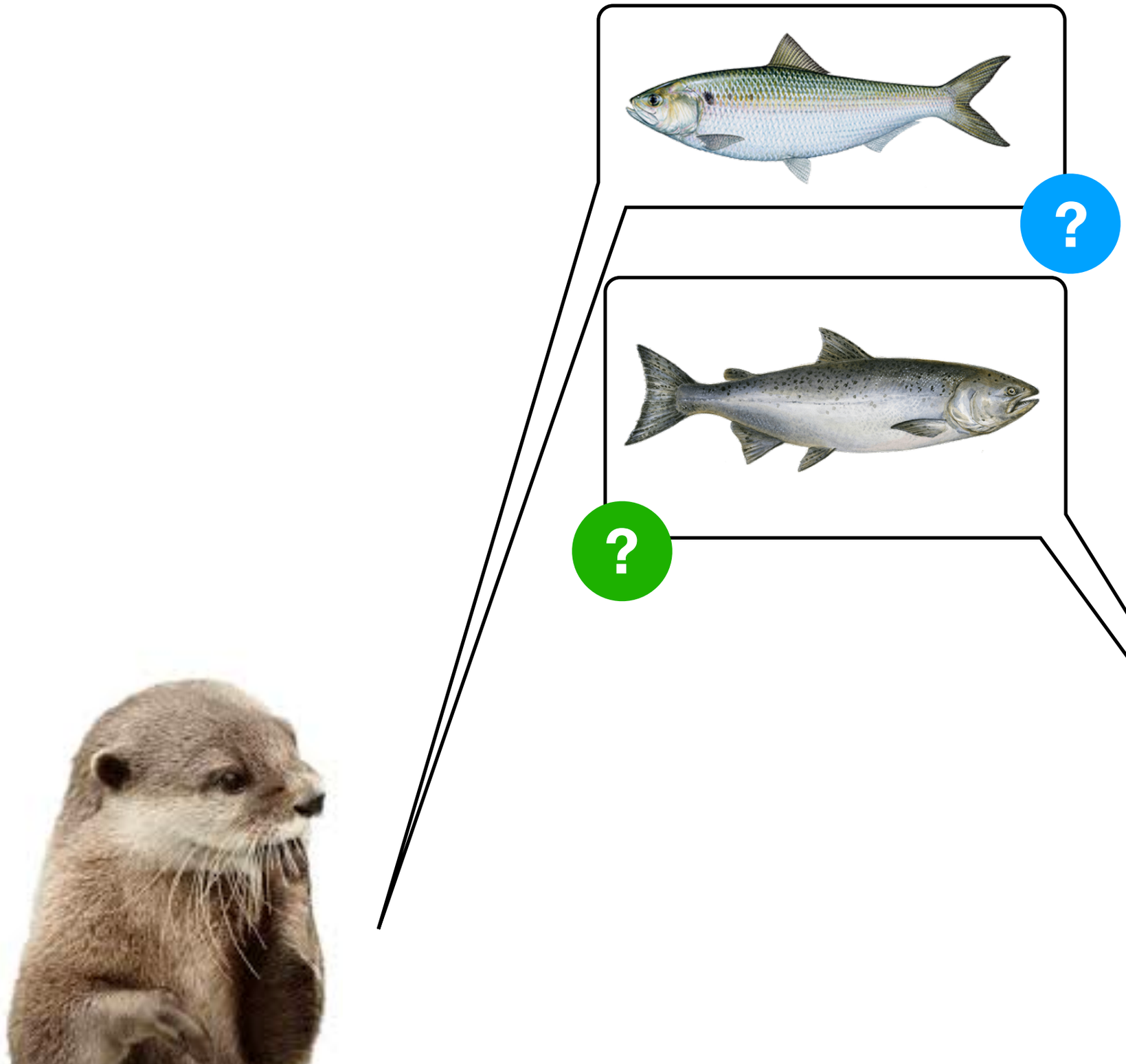

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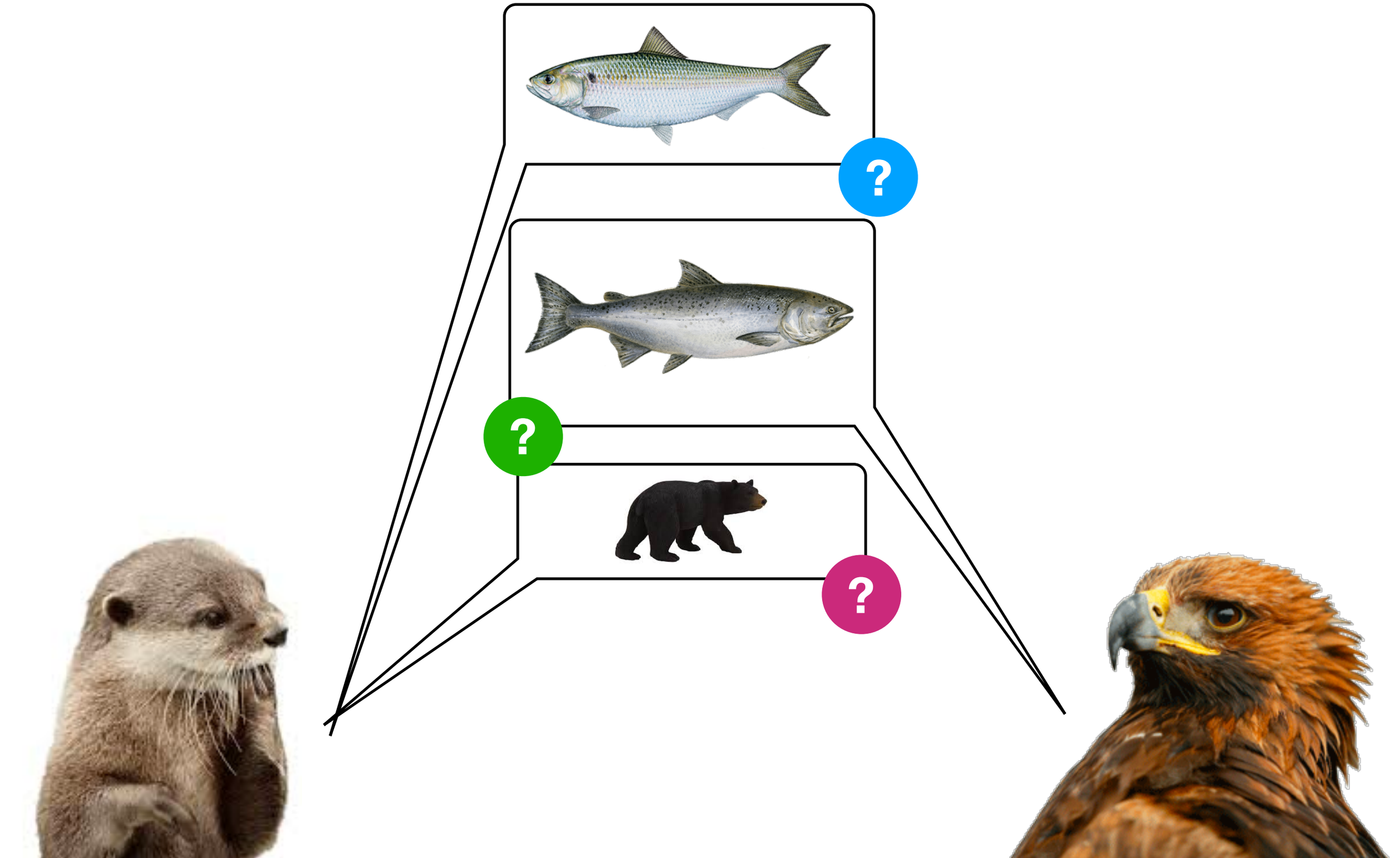

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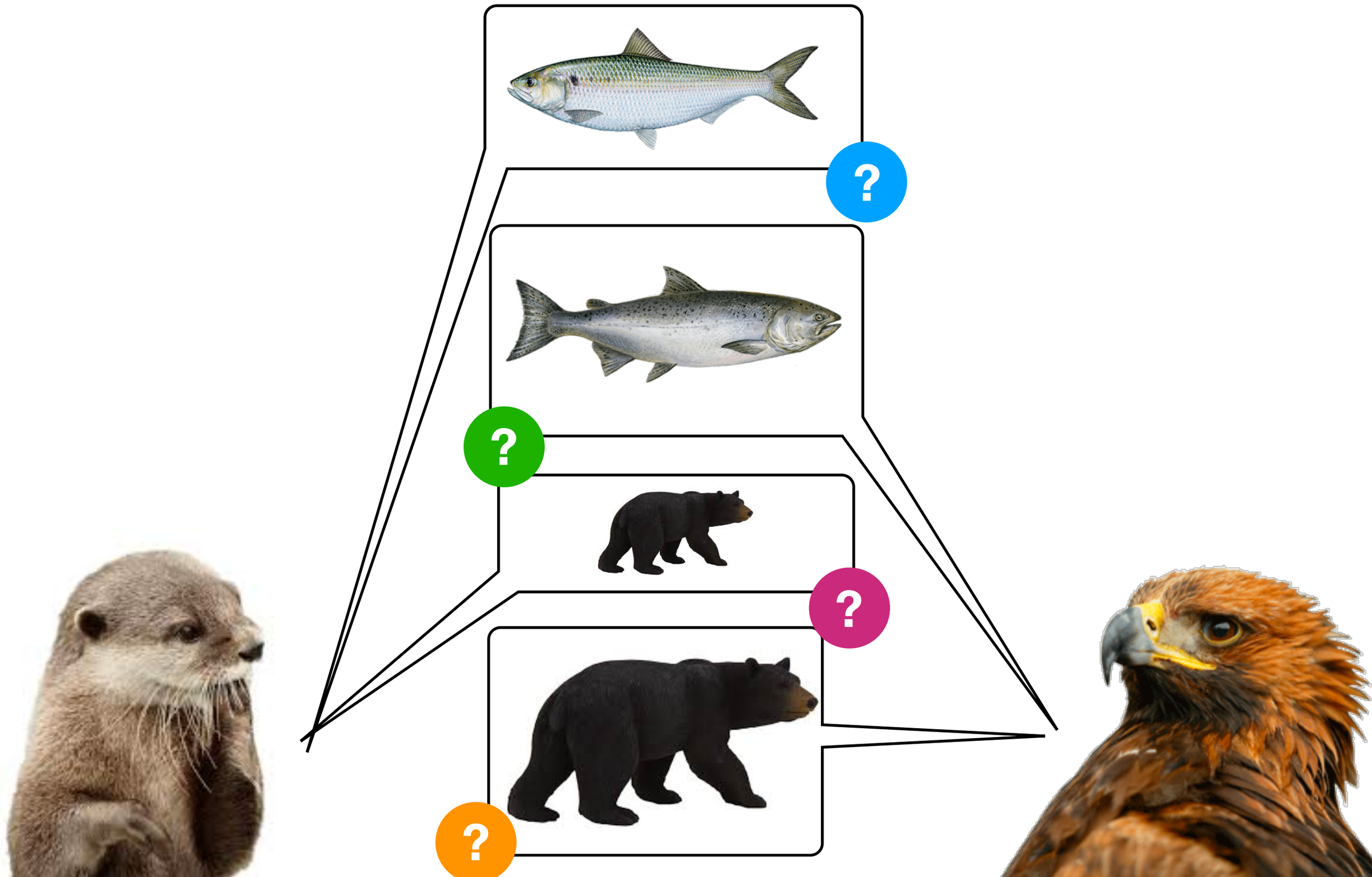

Topic Selection: Theory

Topic Selection: Applications

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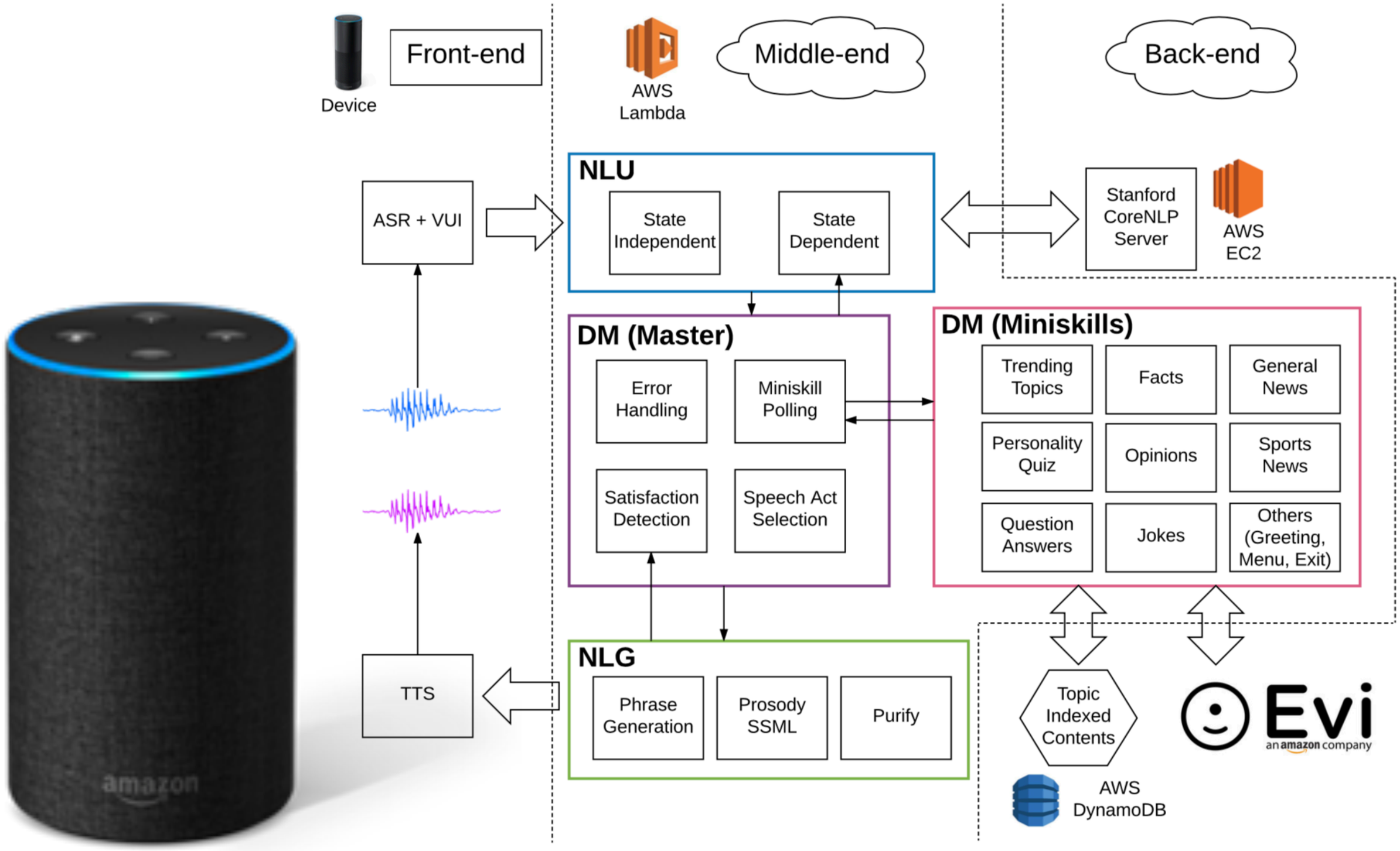

(Sounding Board; Fang et al., 2018)

Topic Selection: Applications

Front-end

Device

Middle-end

AWS Lambda

Back-end

ASR + VUI

NLU

State Independent

State Dependent

Stanford CoreNLP Server

AWS EC2

DM (Master)

Error Handling

Miniskill Polling

Satisfaction Detection

Speech Act Selection

DM (Miniskills)

Trending Topics

Facts

General News

Personality Quiz

Opinions

Sports News

Question Answers

Jokes

Others (Greeting, Menu, Exit)

NLG

Phrase Generation

Prosody SSML

Purify

TTS

Topic Indexed Contents

Evi

an amazon company

AWS DynamoDB

(Sounding Board; Fang et al., 2018)

Research Questions

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Do we learn other people's topic preferences from what they say?

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Not well - we can be egocentric, overconfident, and oblivious

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Does the flow of new topics affect our enjoyment of conversations?

Research Questions

Do we learn other people's topic preferences from what they say?

Not well - we can be egocentric, overconfident, and oblivious

Does the flow of new topics affect our enjoyment of conversations?

Conversation can be more enjoyable with frequent topic switching together

What is a Topic Preference?

What is a Topic Preference?

Imagine you're meeting someone for the first time and having a friendly conversation, and s/he asks you the following question:

What is the strangest thing about the place you grew up?

What would you say in response?
Please write your answer in the box below.

What is a Topic Preference?

Imagine you're meeting someone for the first time and having a friendly conversation, and s/he asks you the following question:

Are you a religious person? Why?

What would you say in response?
Please write your answer in the box below.

What is a Topic Preference?

Imagine you're meeting someone for the first time and having a friendly conversation, and s/he asks you the following question:

Do you have any fruit trees, plants, or a garden?

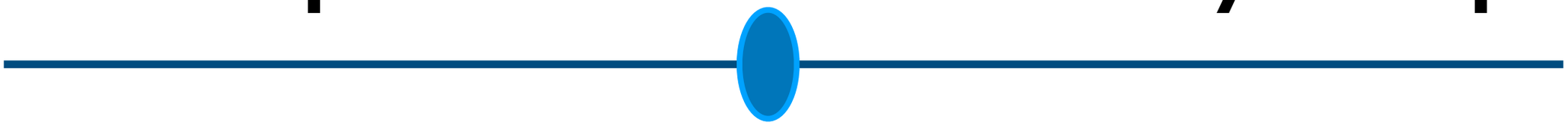
What would you say in response?
Please write your answer in the box below.

What is a Topic Preference?

At this point in the conversation, would you want to talk more about this topic? Or would you want to switch to a new topic?

Please tell us your preference using the slider below, which ranges from -10 (strong preference to switch topics) to +10 (strong preference to stay on topic).

Switch Topics **Stay on Topic**



Preference Detection Game

Preference Detection Game

Do you have any fruit trees, plants or a garden?

No, I don't. My dad loves gardening though. Every summer he plants seeds and grows a vegetable garden. He has a PhD in agriculture, so he has a bunch of knowledge about growing vegetables. He loves gardening!

When was the last time you sang to yourself? To someone else?

Oh, I'm a terrible singer! I do still sing along to songs in private though. Just yesterday I was singing along to a Taylor Swift song. I never sing in front of people! I'm too embarrassed!

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Switch Topics

Stay on Topic

Preference Detection Game

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-2

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6

Switch Topics **Stay on Topic**

Preference Detection Game

What do you do for work? What do you like about it?

I'm an administrative assistant at a large university. I basically support several higher-up administrators. I don't really like my job. The only thing I do like is my coworkers. Most of them, anyway.

What do you value most in a friendship?

I value honesty in a friendship. I don't want to feel like someone is being fake with me or that I need to be fake with them. Open communication is key for me. I also value loyalty.

Switch Topics **Stay on Topic**

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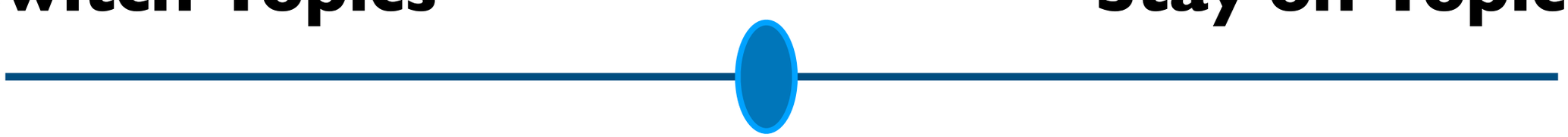
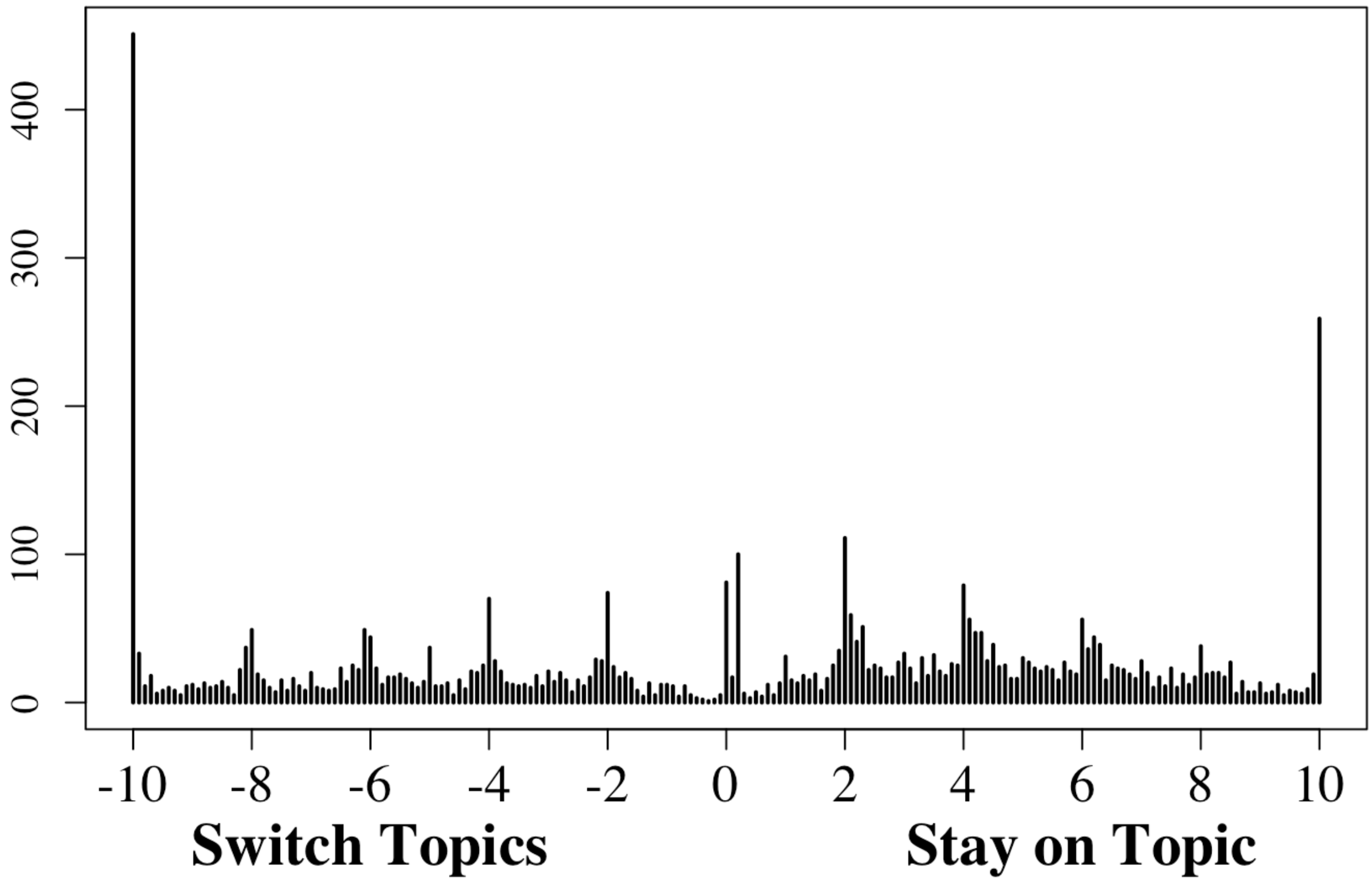
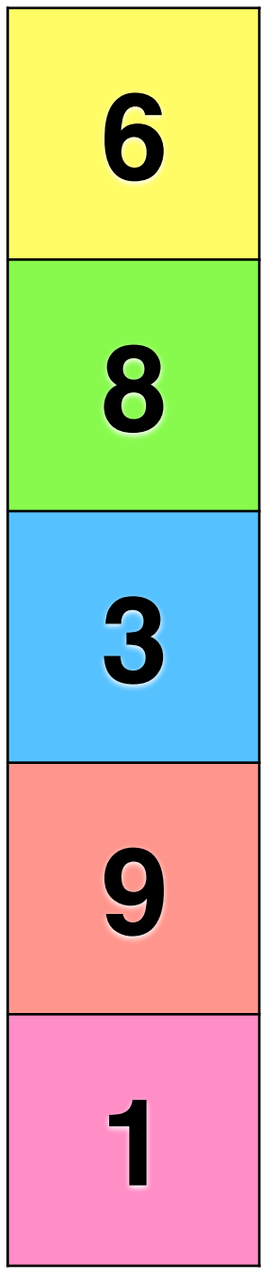


Topic Preference Distribution



Preference Detection Accuracy

Non-parametric, within-person



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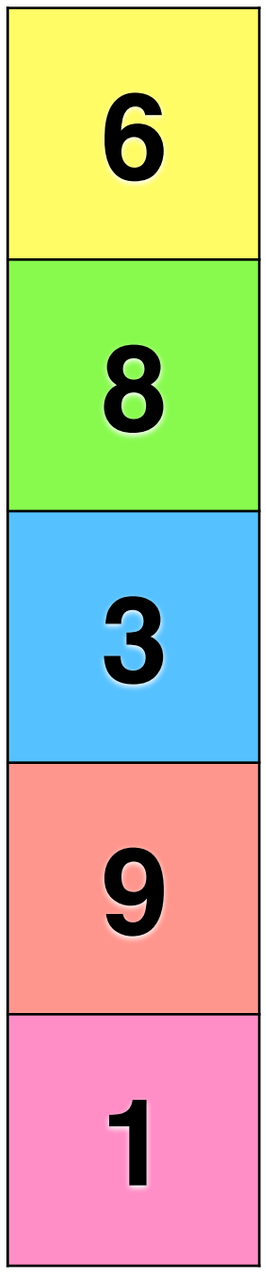
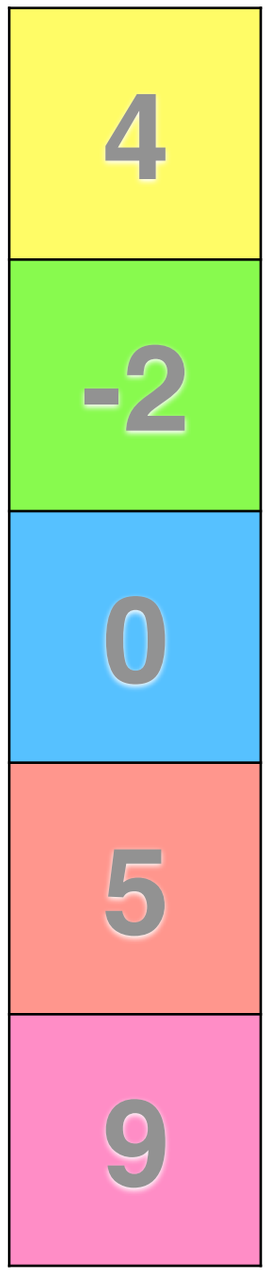
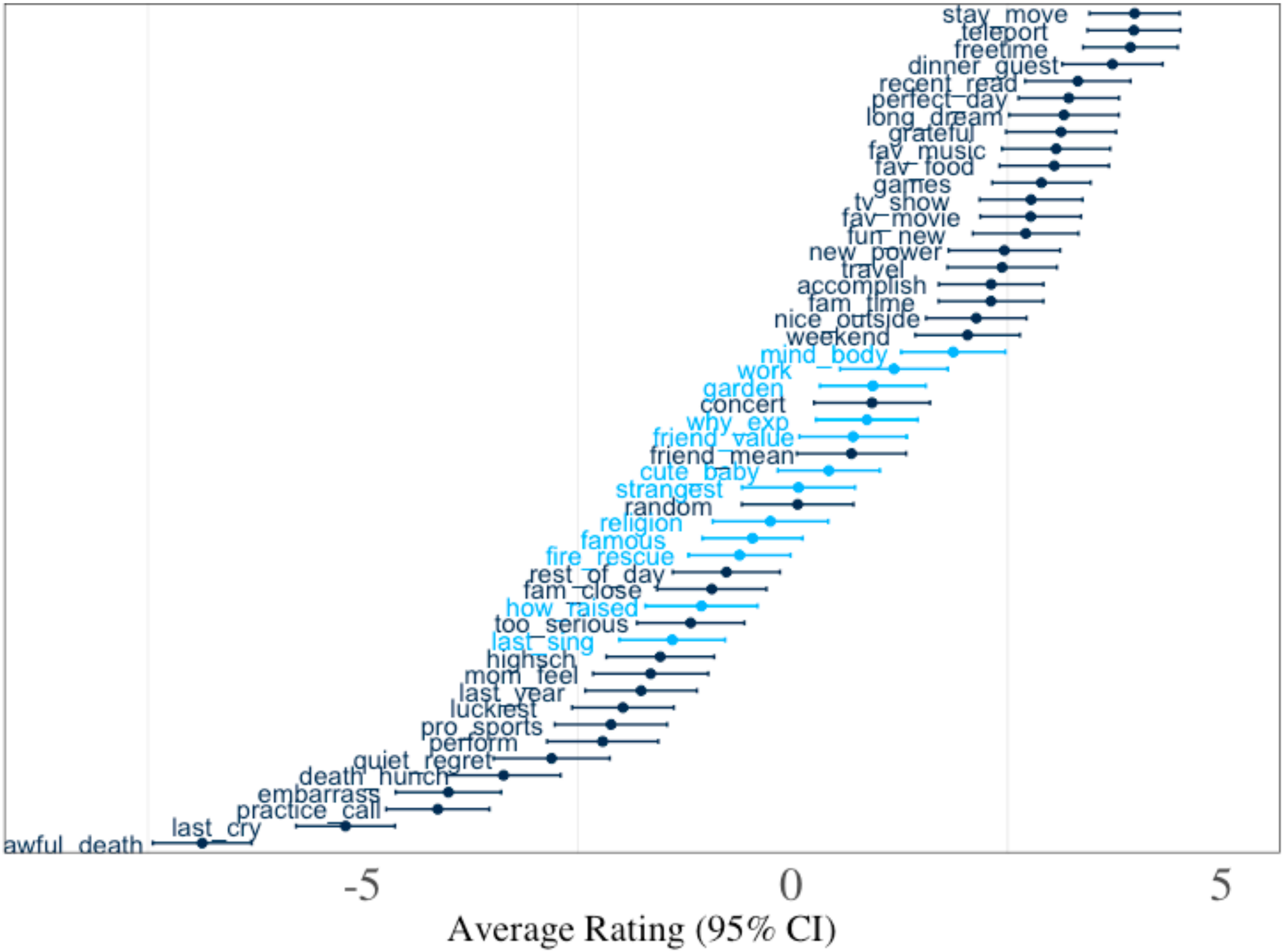




Pilot Study with 50 Topics



What do you do for work? What do you like about it?
Why do you do these kinds of studies?
Are you a religious person? Why?
Do you have any fruit trees, plants, or a garden?
What's the strangest thing about where you grew up?
What is the cutest thing you've seen a baby or child do?
Would you like to be famous? In what way?
When did you last sing to yourself? To someone else?
If you were able to live to the age of 90 and retain either the mind or body of a 30-year-old for the last 60 years of your life, which would you want?
If you could change anything about the way you were raised, what would it be?
What do you value most in a friendship?
Your house, containing everything you own, catches fire. After saving your loved ones and pets, you have time to safely make a final dash to save any one item. What would it be? Why?

Topic Preference Detection

Topic Preference Detection

Study 1 (n=392, 654; mTurk)

Writers & **Readers** recruited separately

Topic Preference Detection

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Study 2 (n=172; in-lab)

Close others recruited as pairs

Topic Preference Detection

Study 1 (n=392, 654; mTurk)

Writers & **Readers** recruited separately

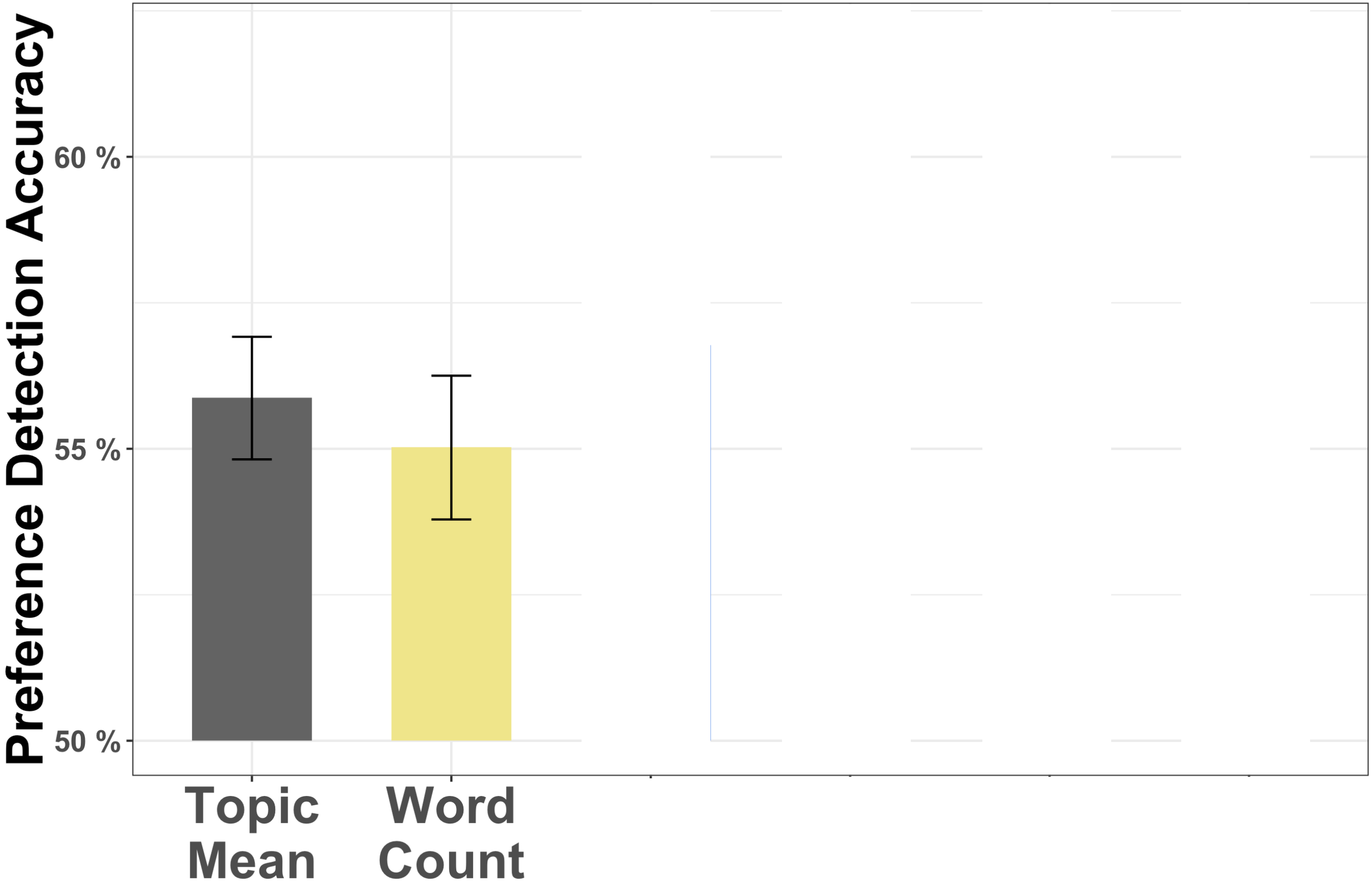
Study 2 (n=172; in-lab)

Close others recruited as pairs

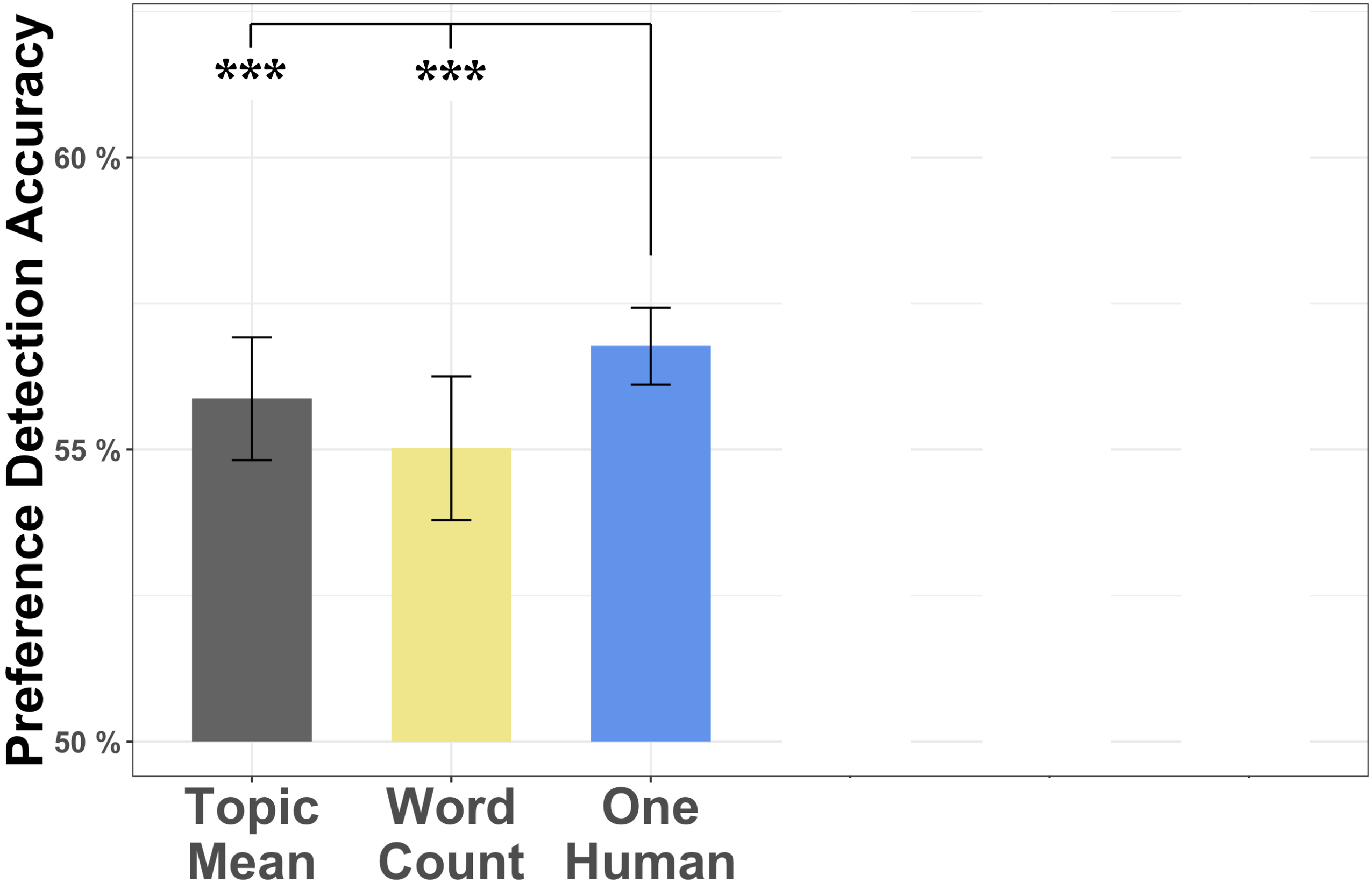
Study 3 (n=192 in-lab)

Discussed topics with partner for 10 min

Study 1 - Accuracy



Study 1 - Accuracy



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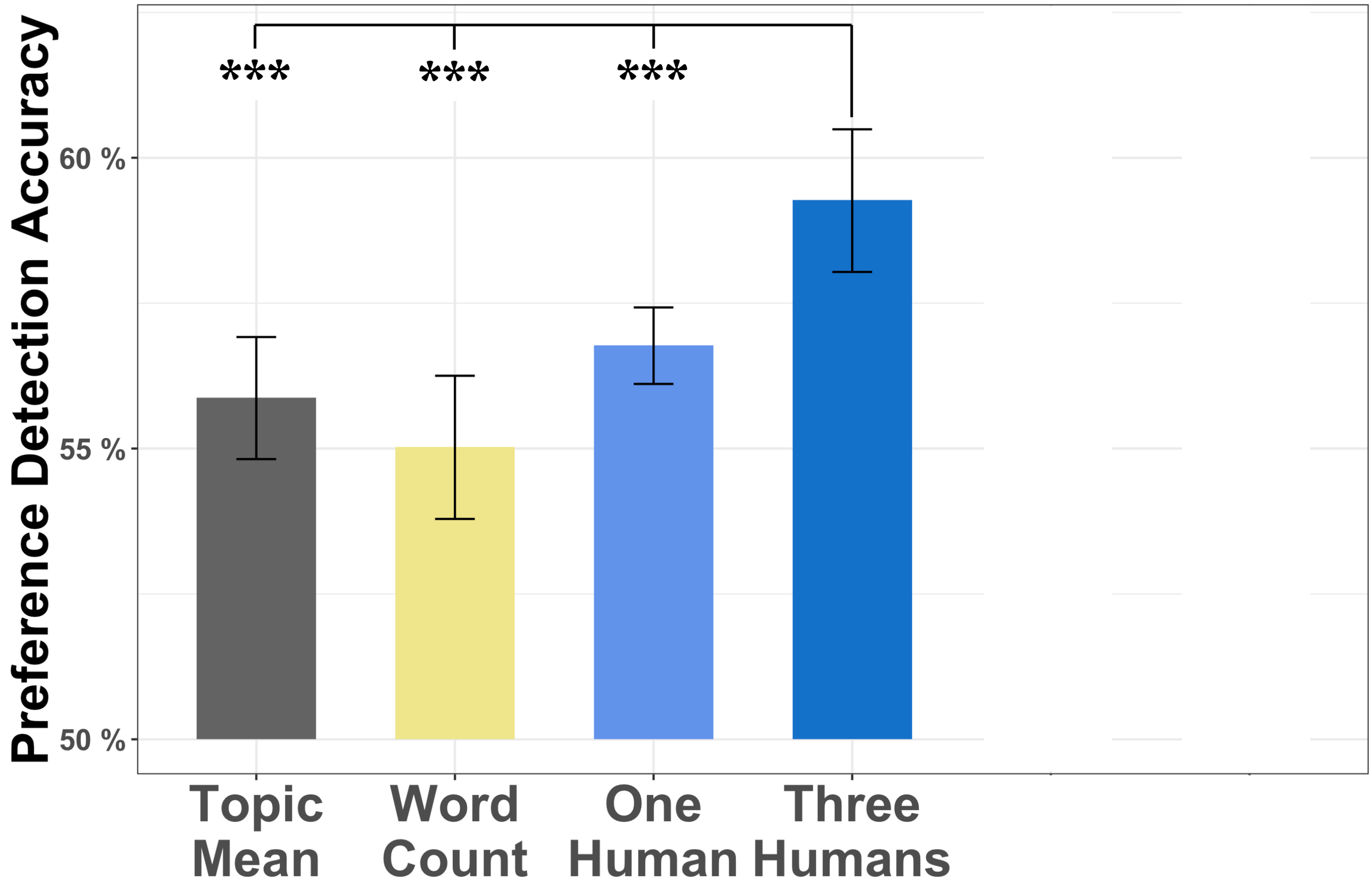
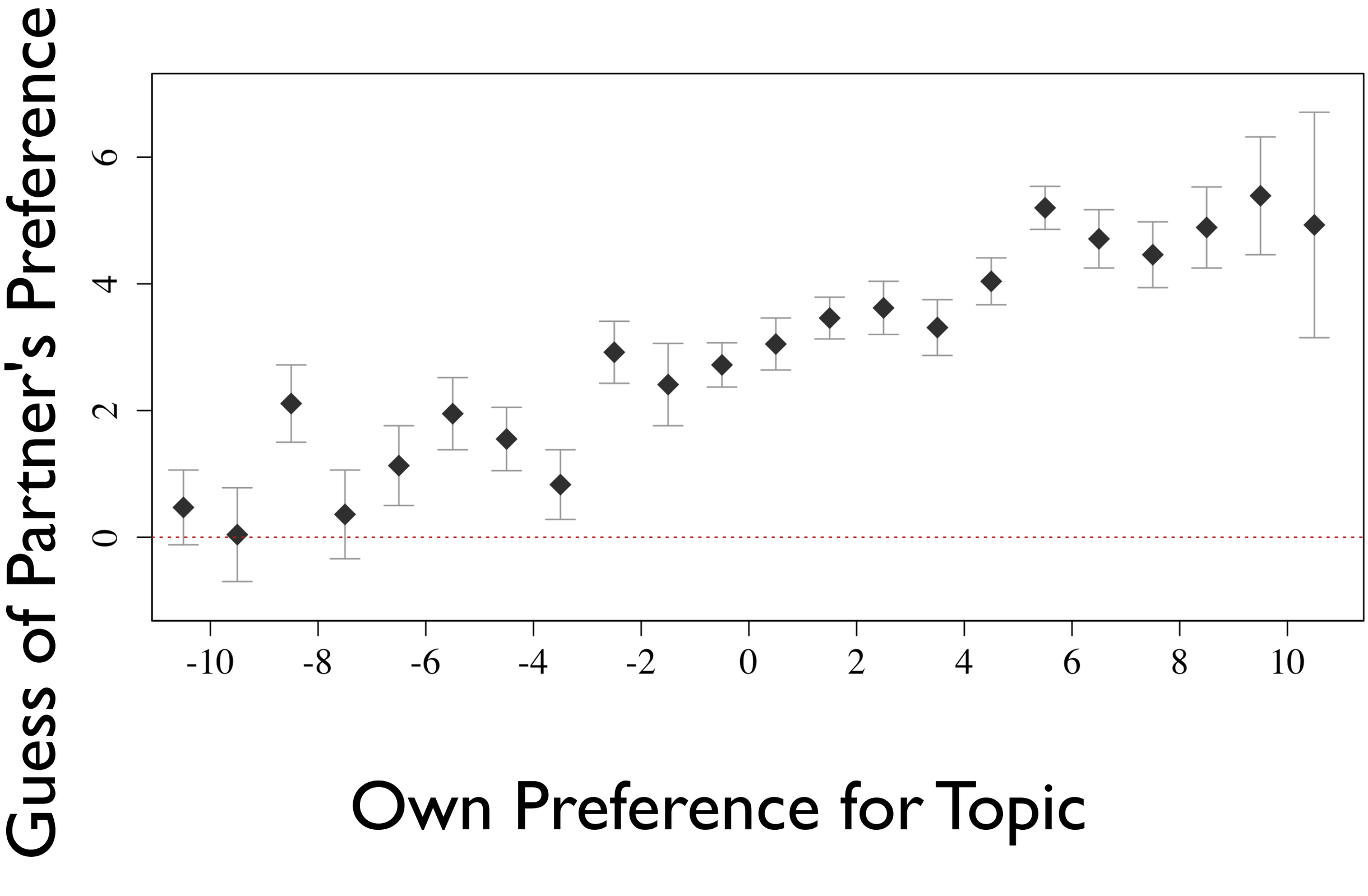


Reader Heuristics: Egocentrism



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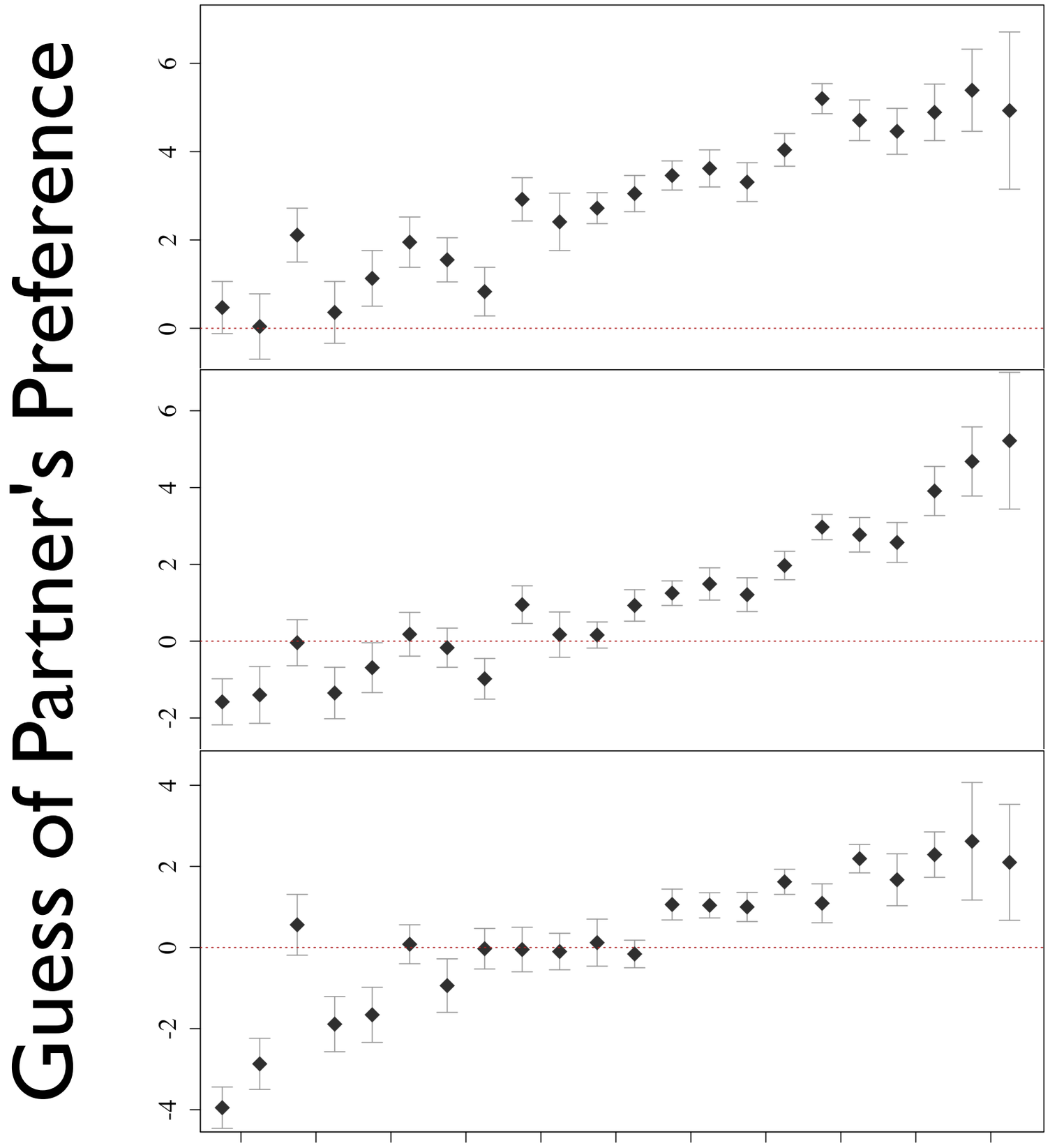
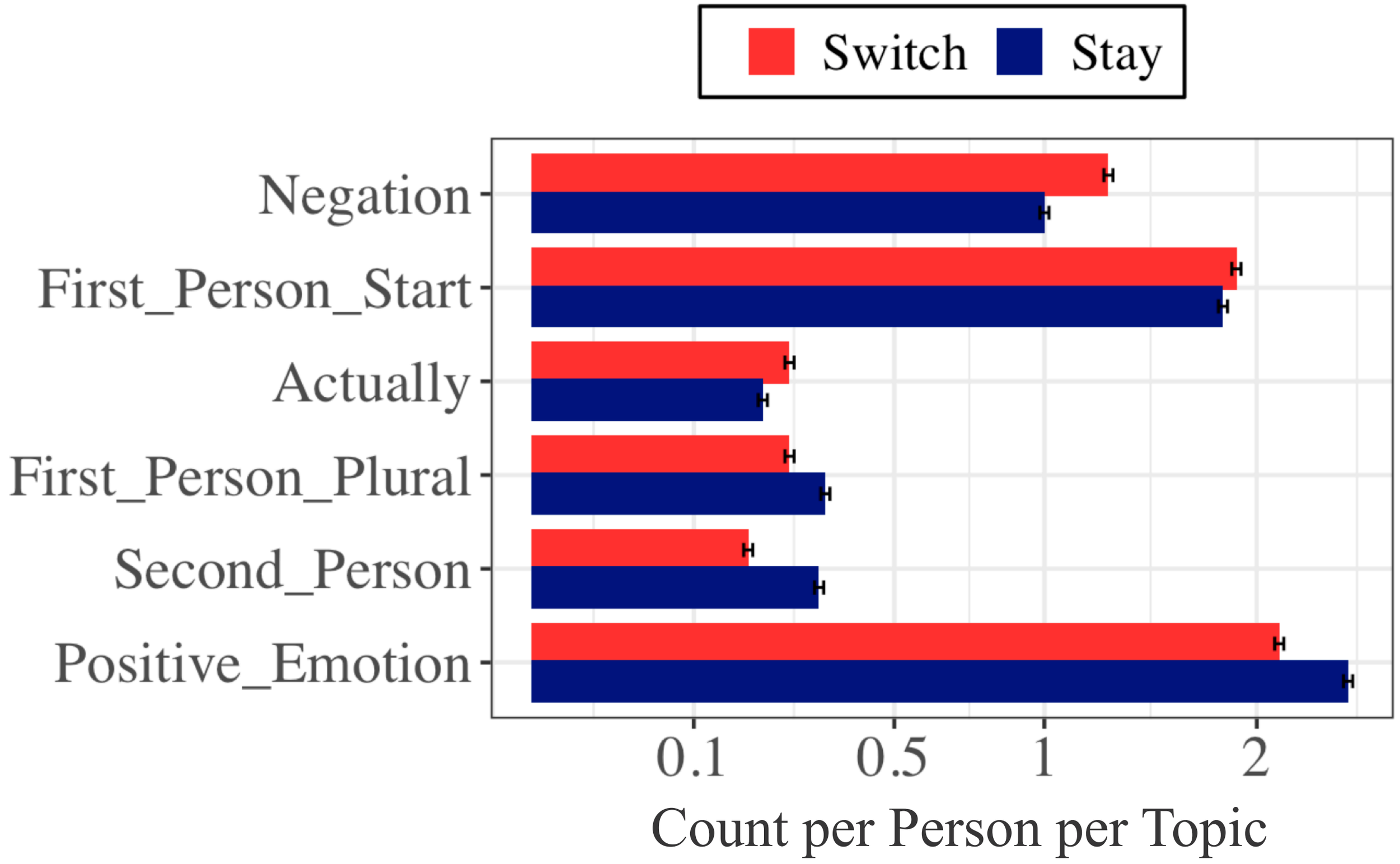


Study 1

Study 2

Study 3

Politeness Cues (R package)



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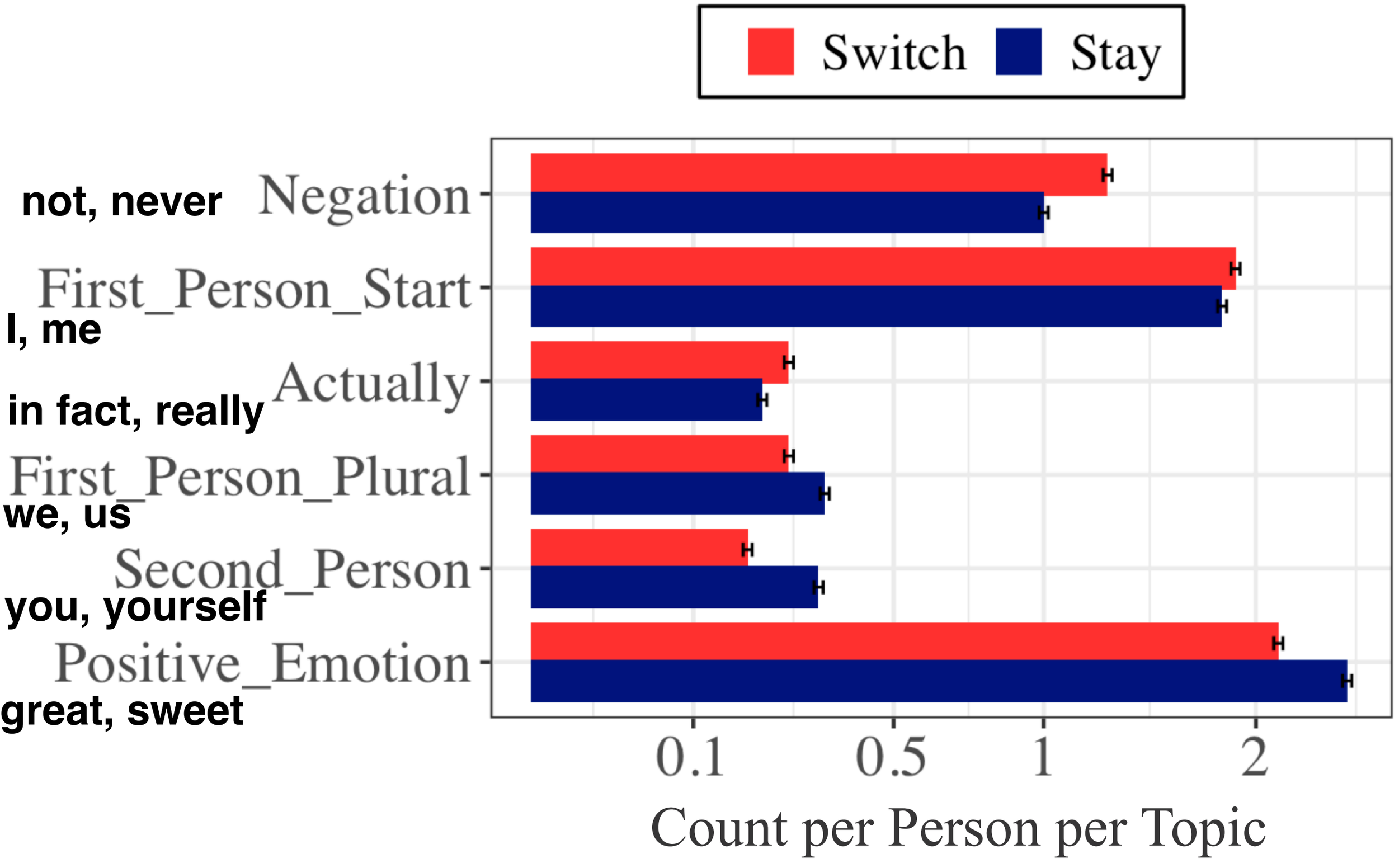
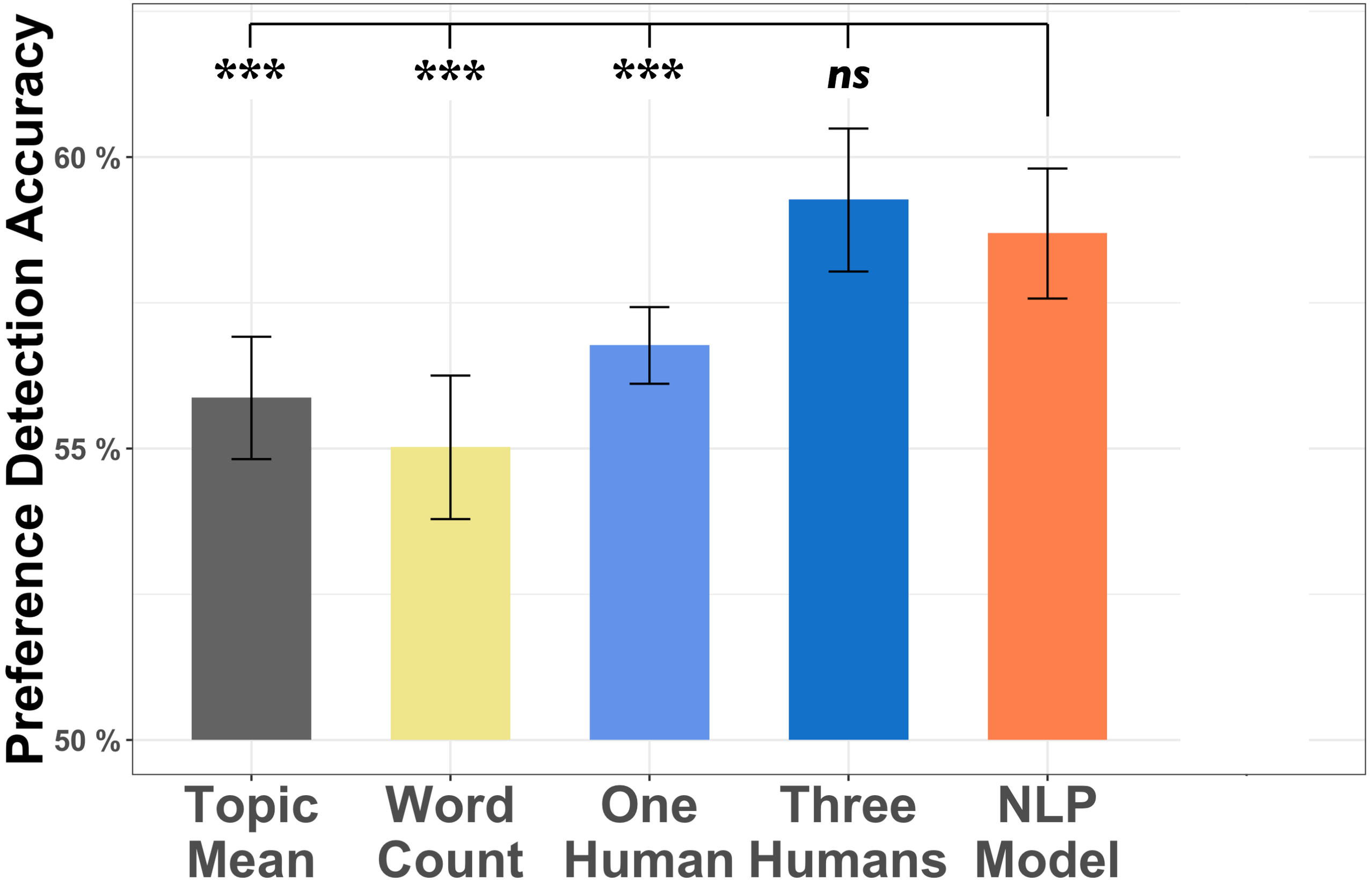


Word Count Signal

Study 1 - Accuracy



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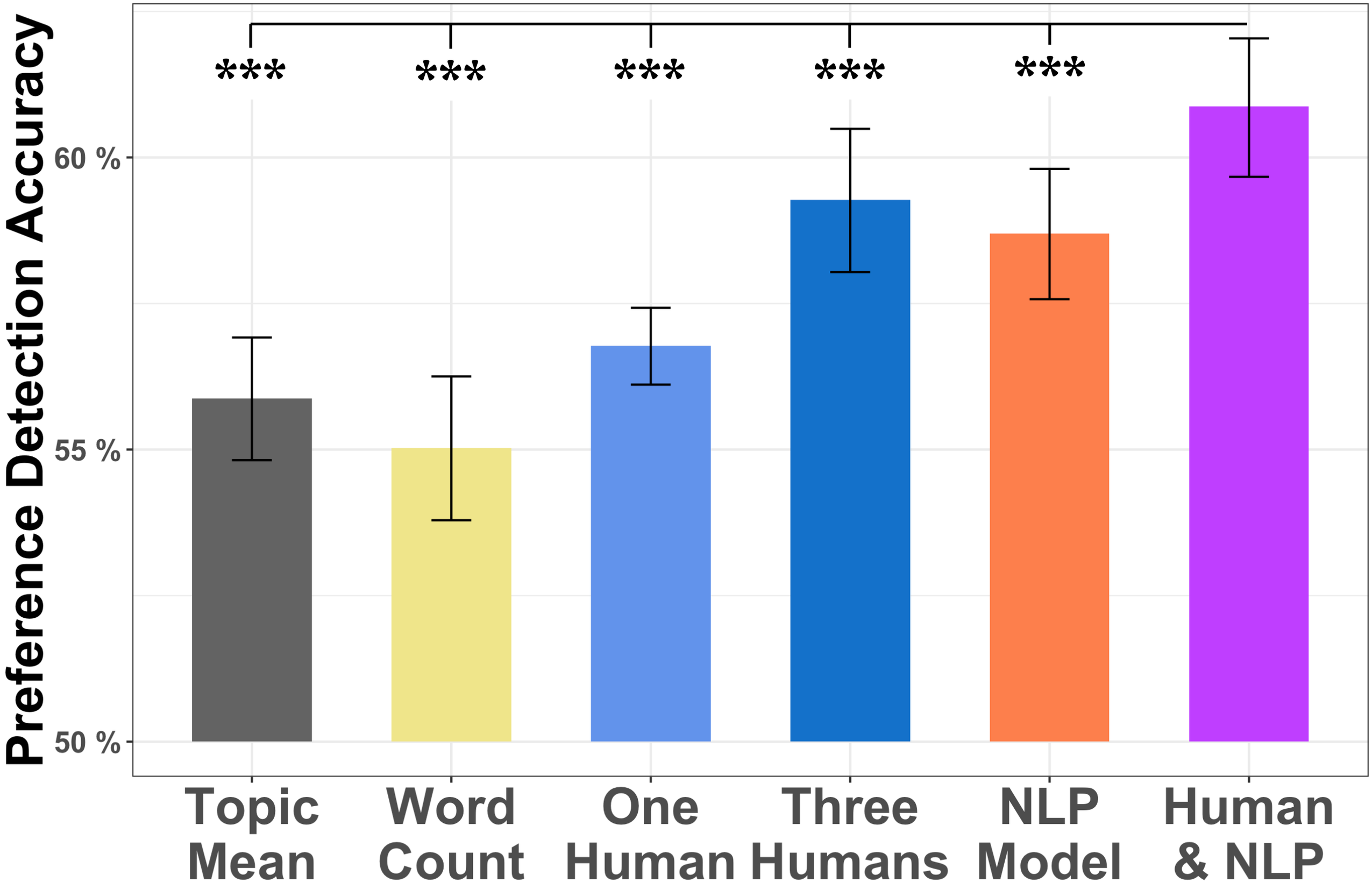
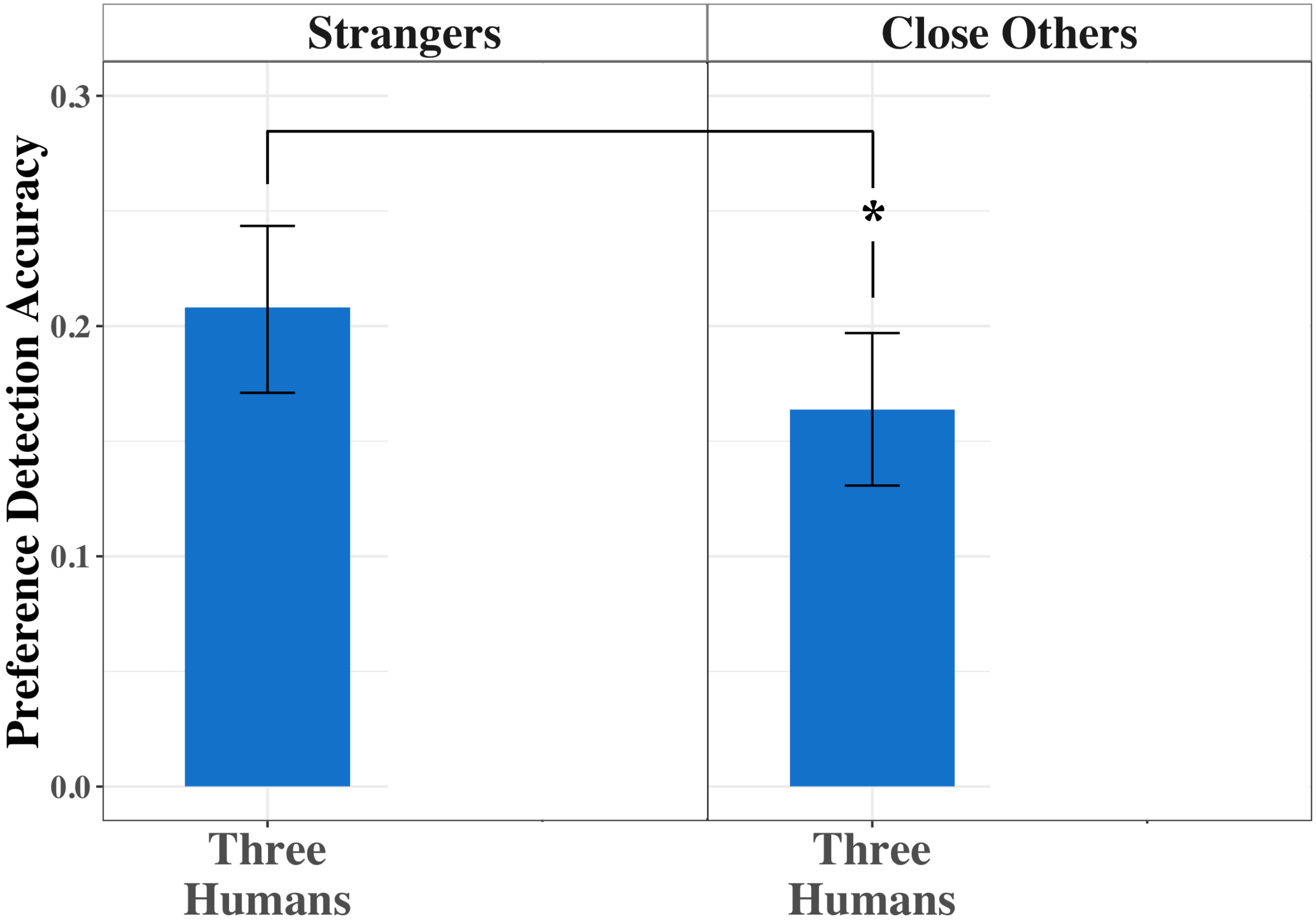


Preference Detection Performance



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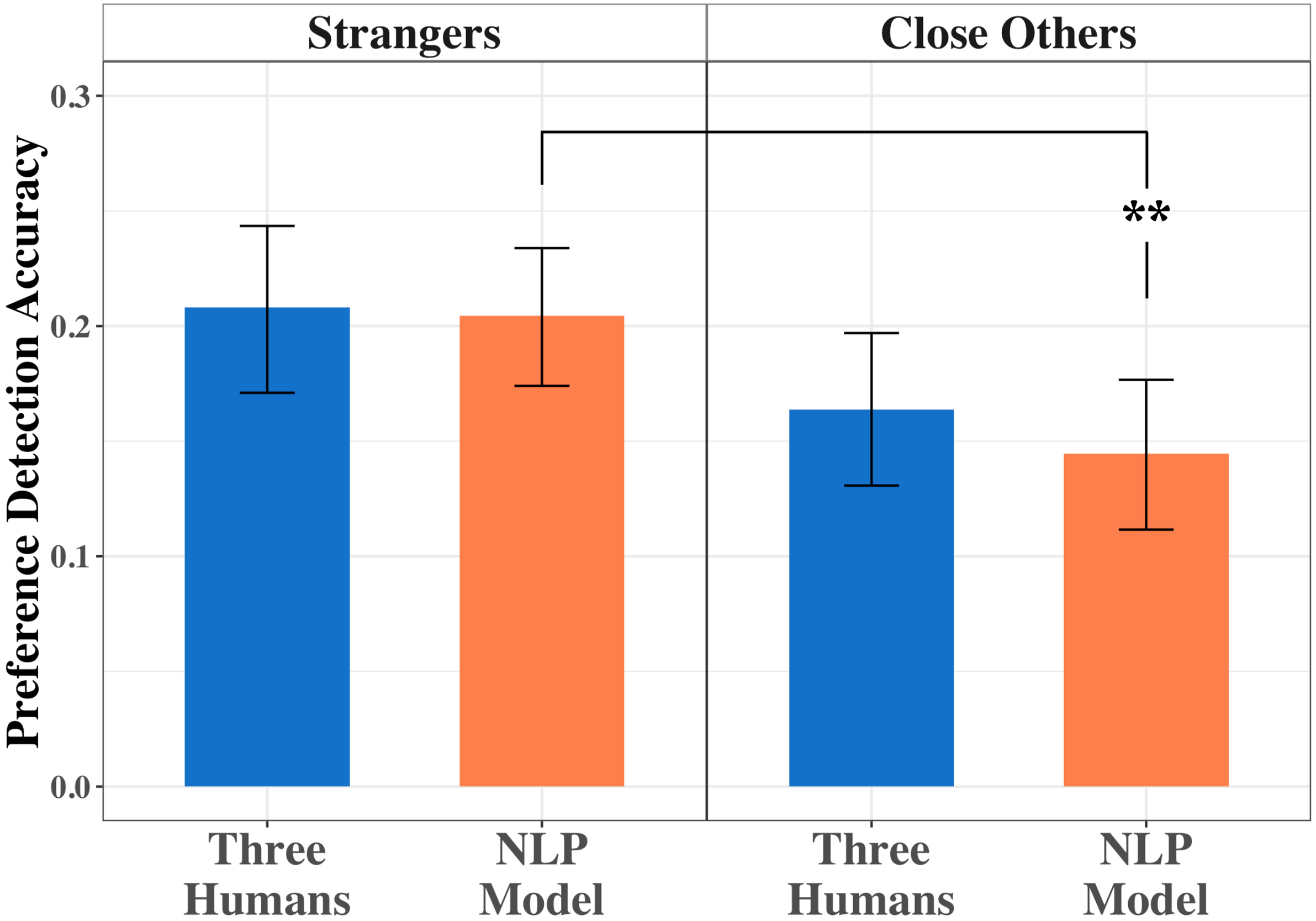
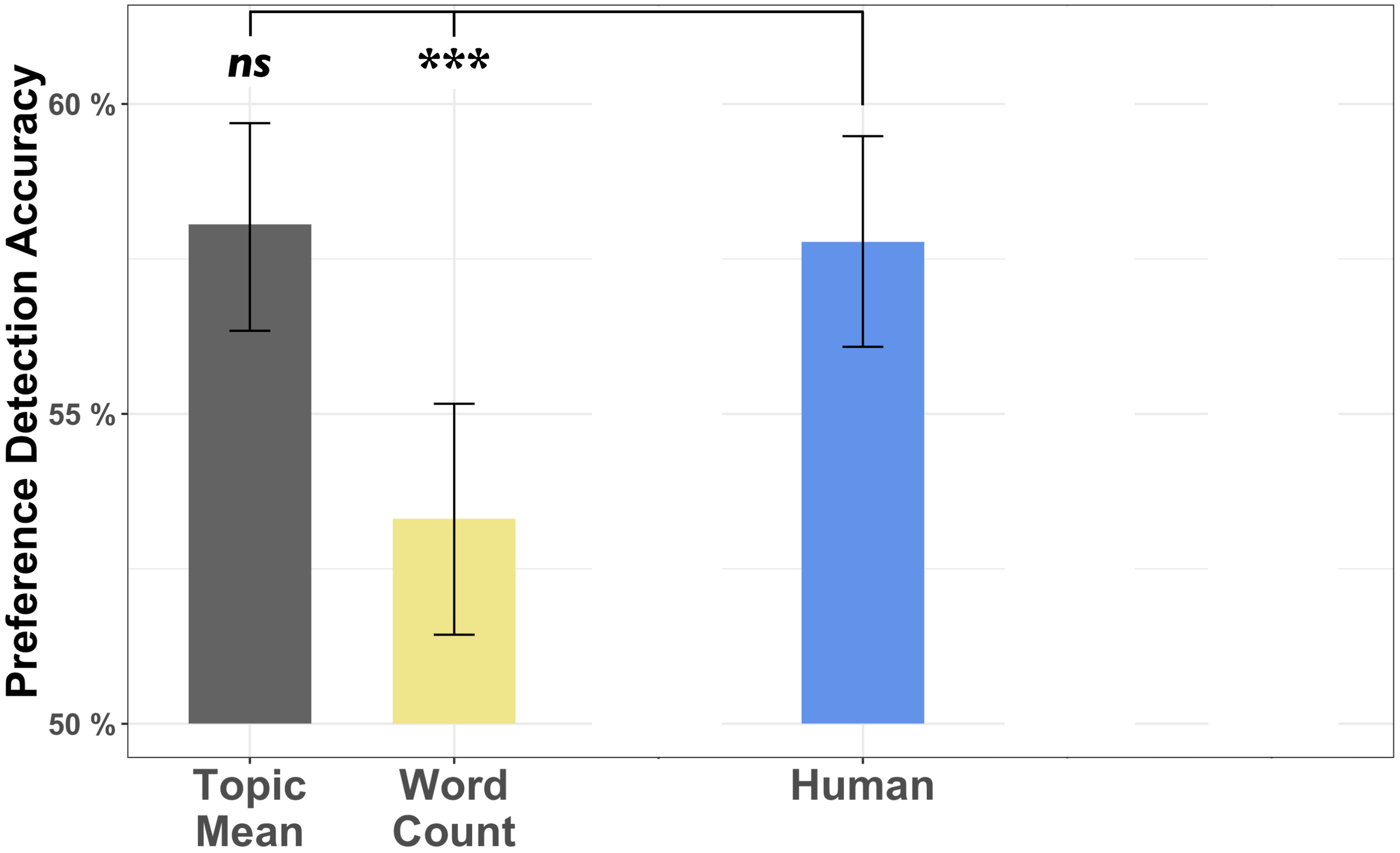


Study 2 Accuracy (close others)



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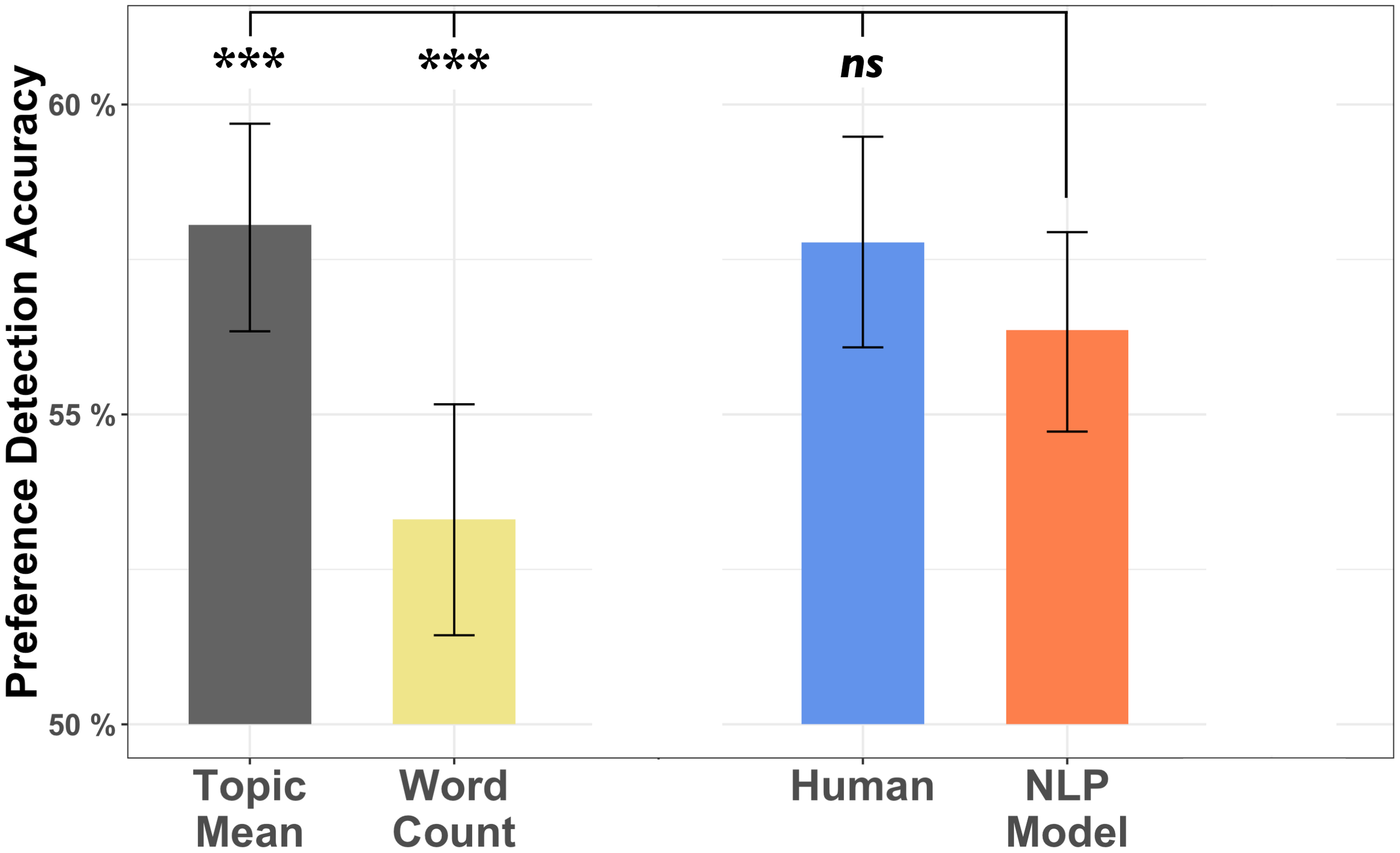

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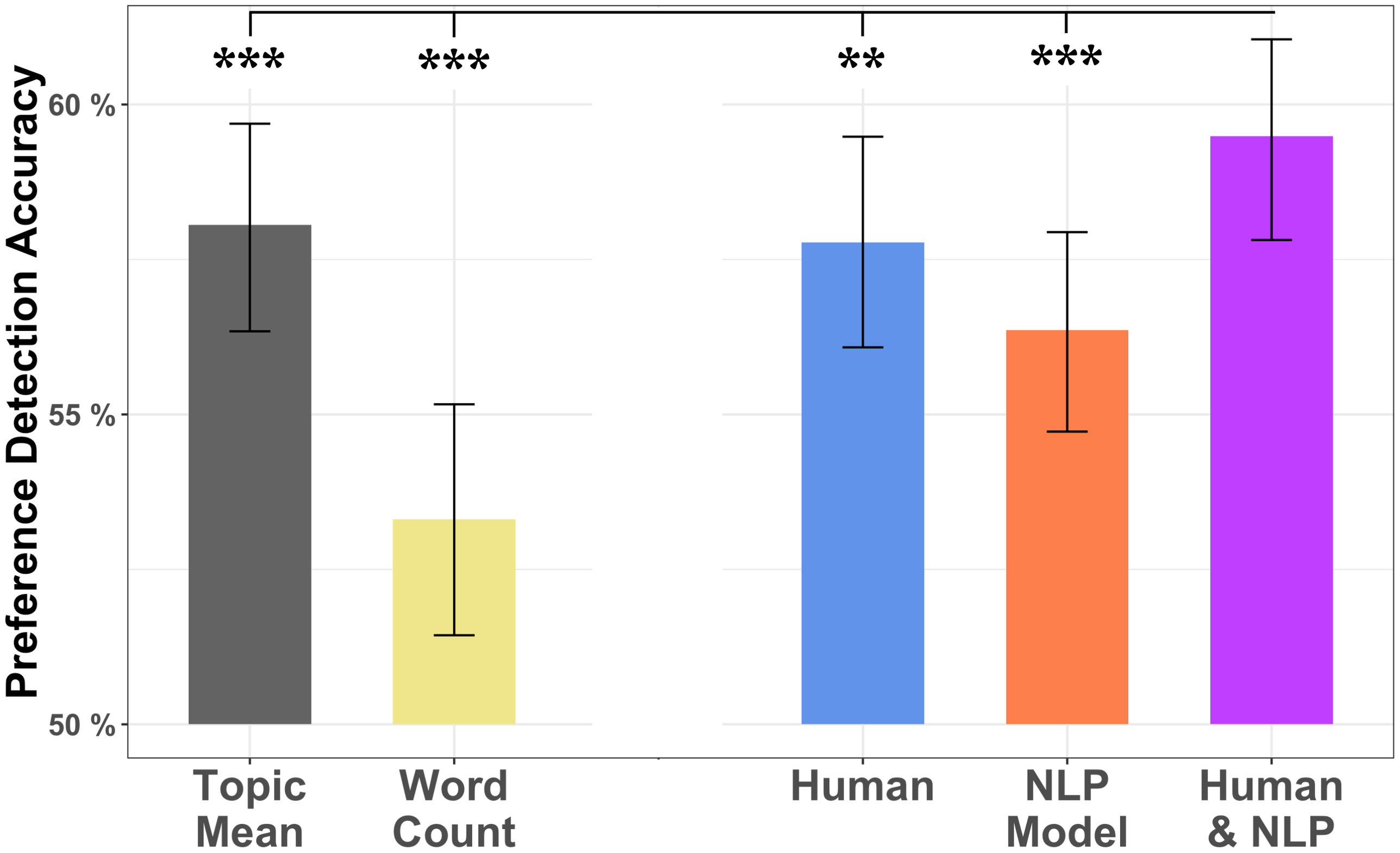

Partner Knowledge

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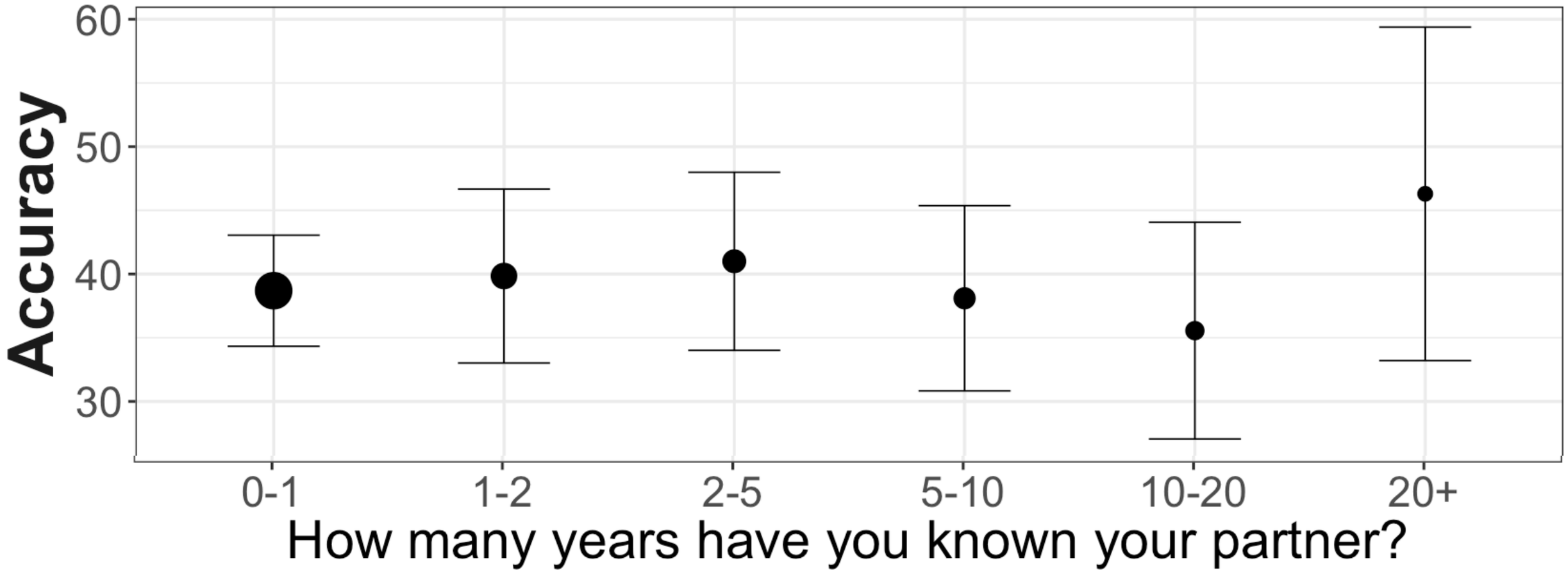

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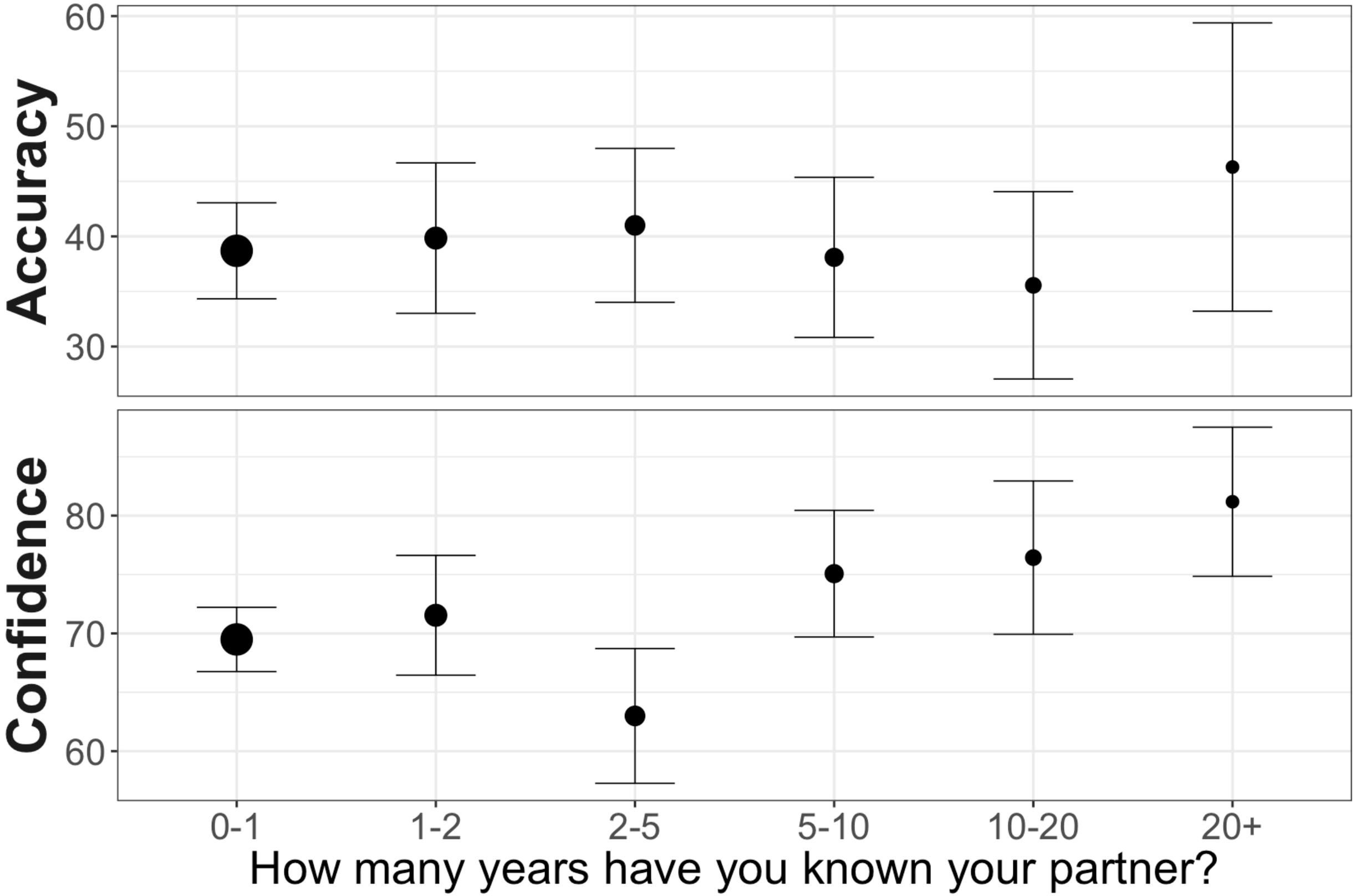

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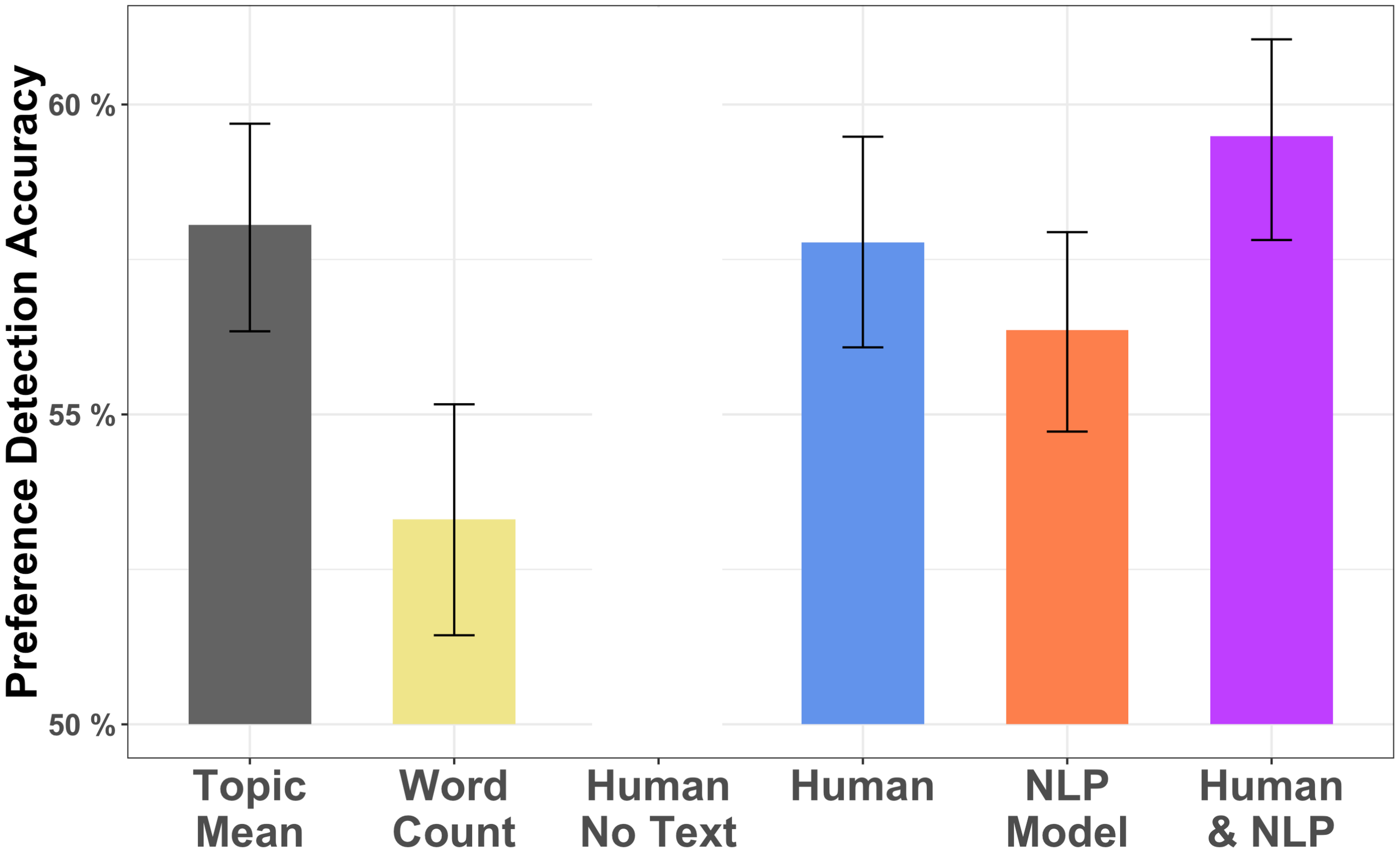

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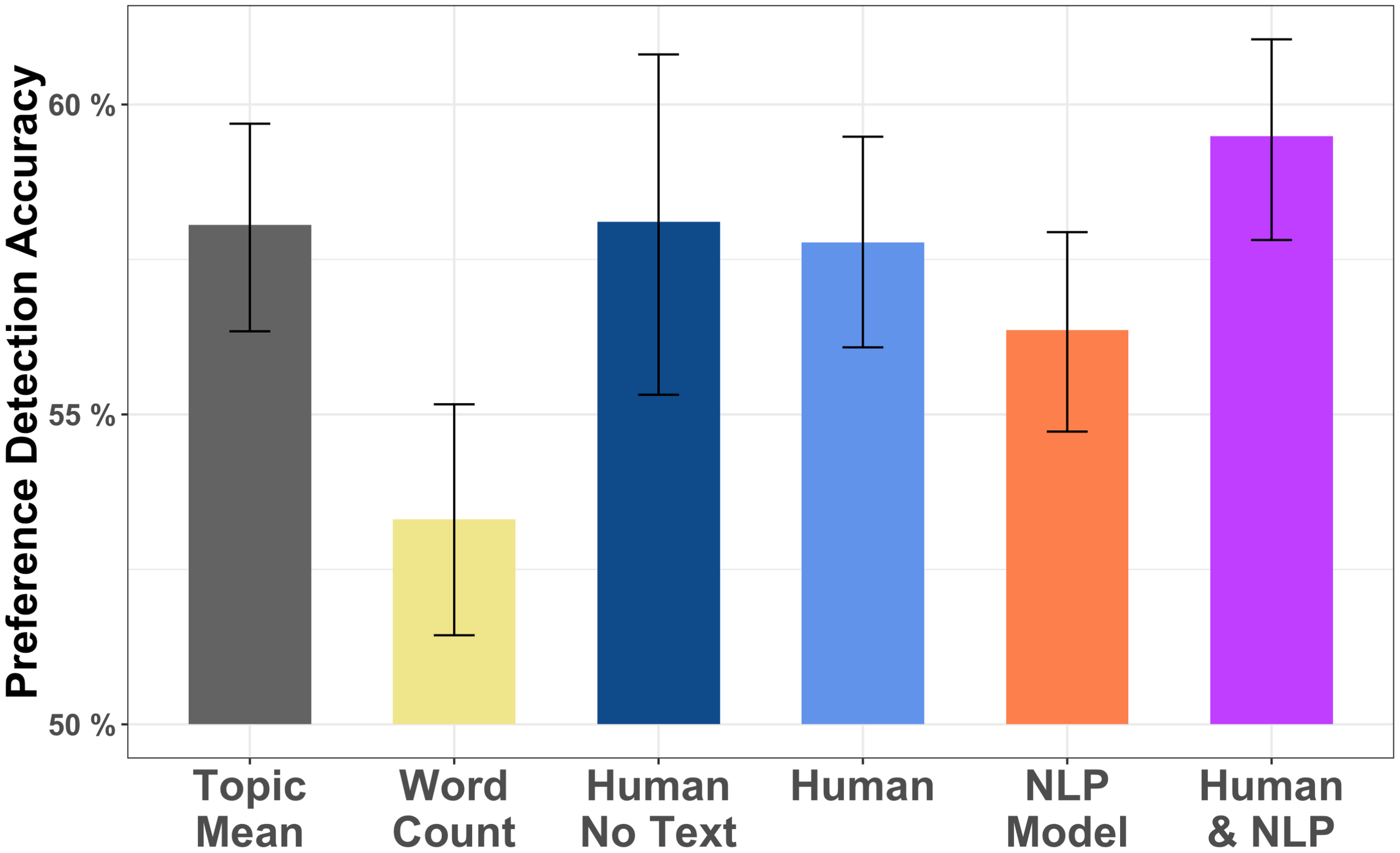

Study 3: Live Chat

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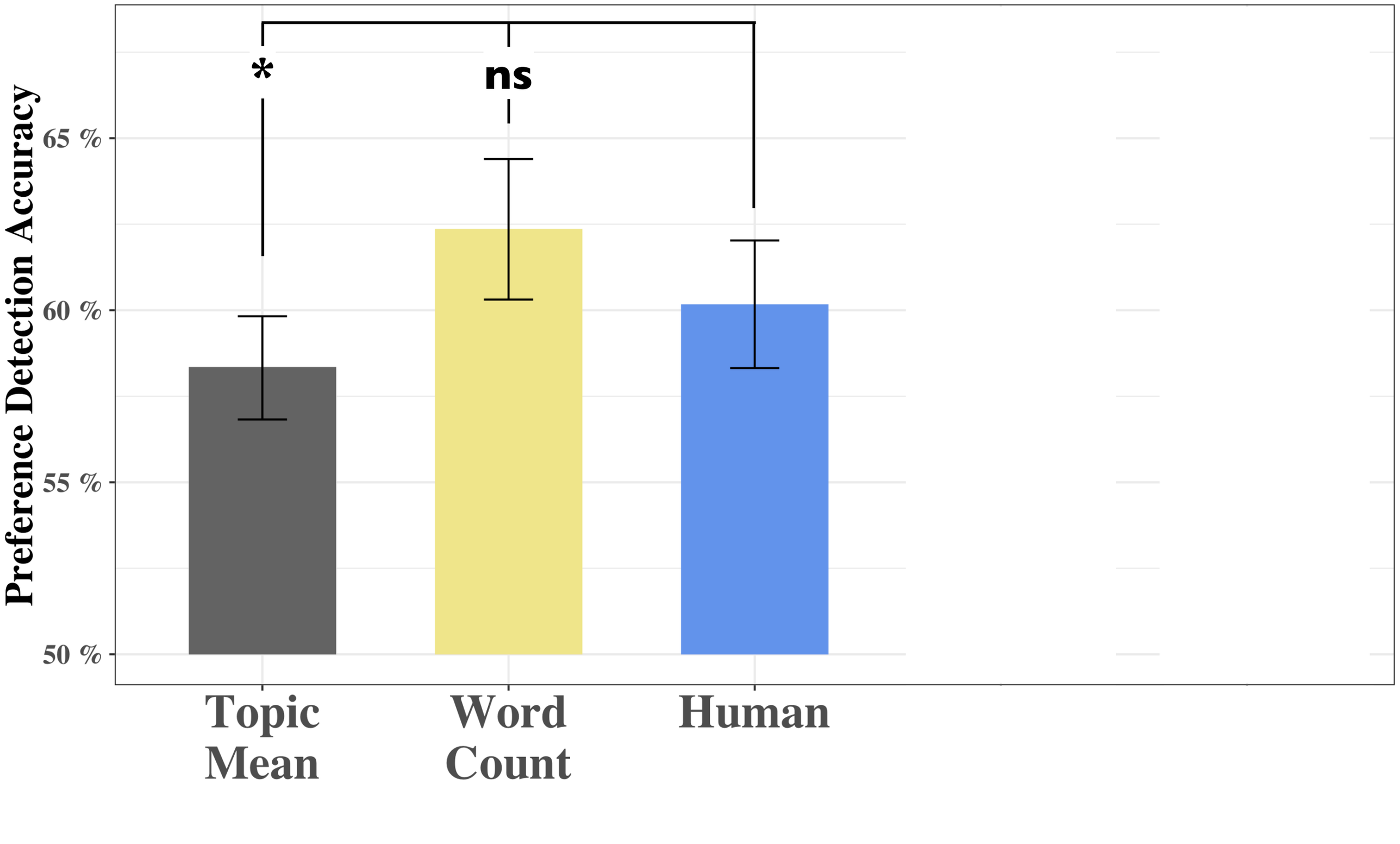
Study 3 Accuracy (live chat)



Topic Preference Indicators

Dialogue Acts

(Passonneau & Litman, 1997; Jurafsky & Martin, 2017)

- backchannels
- pauses
- interruptions
- laughter

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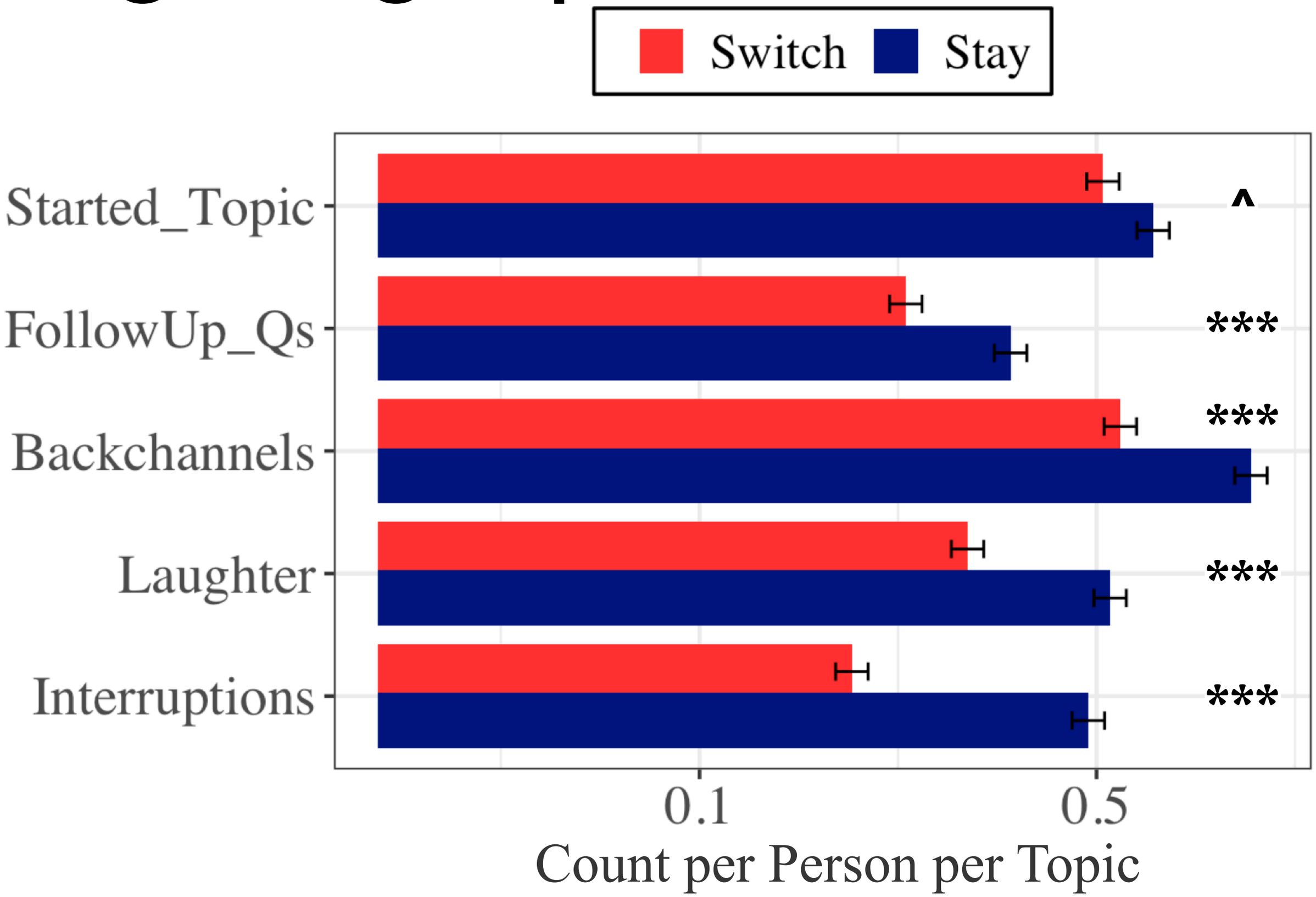
Question Types

(Huang, Yeomans, Brooks, Minson & Gino, 2017; *ibid,* 2019)

- mirror "*how about you?*"
- follow-up "*cool, when was that?*"
-switch "*did you hear the news?*"

Signaling Topic Preferences



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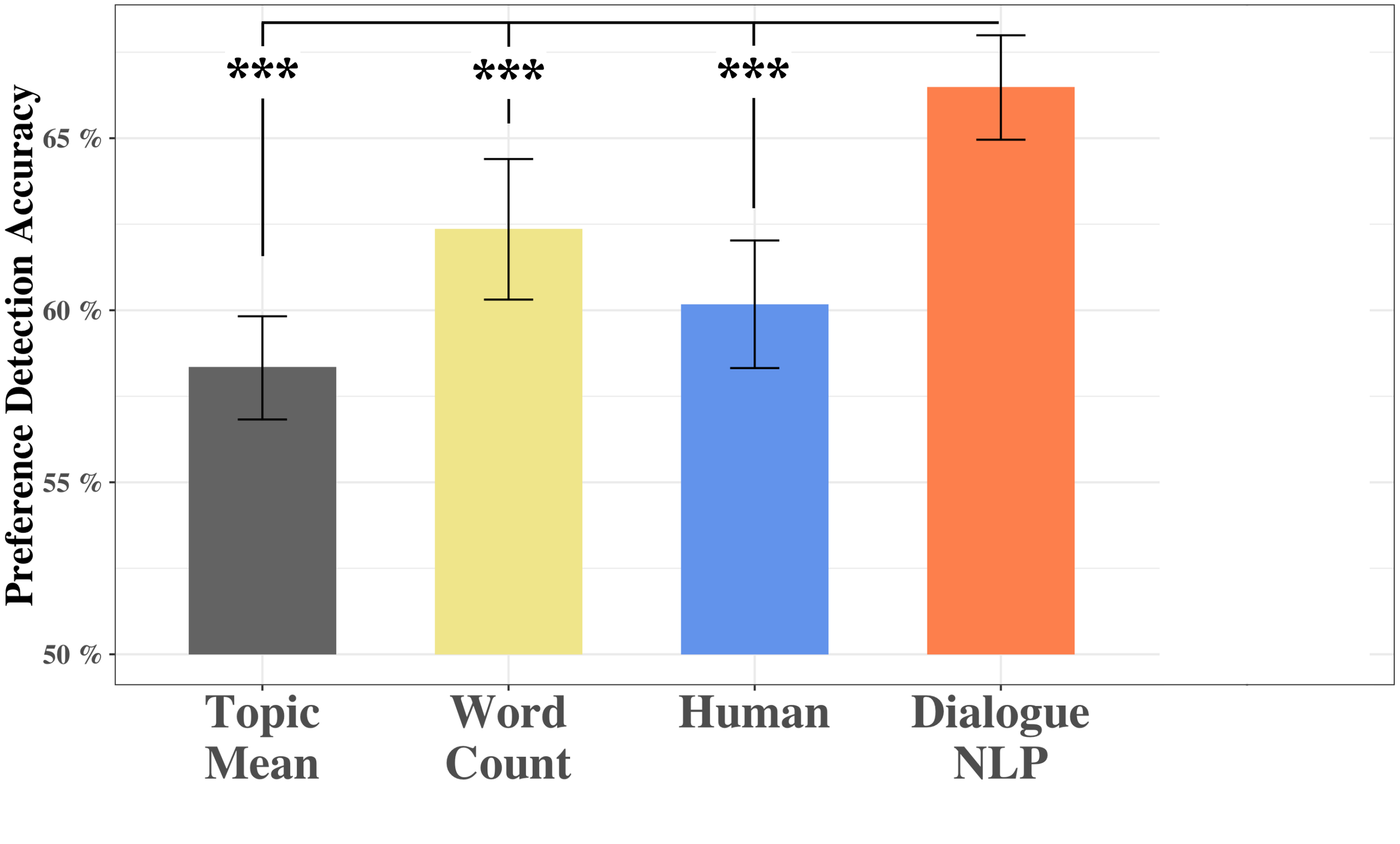

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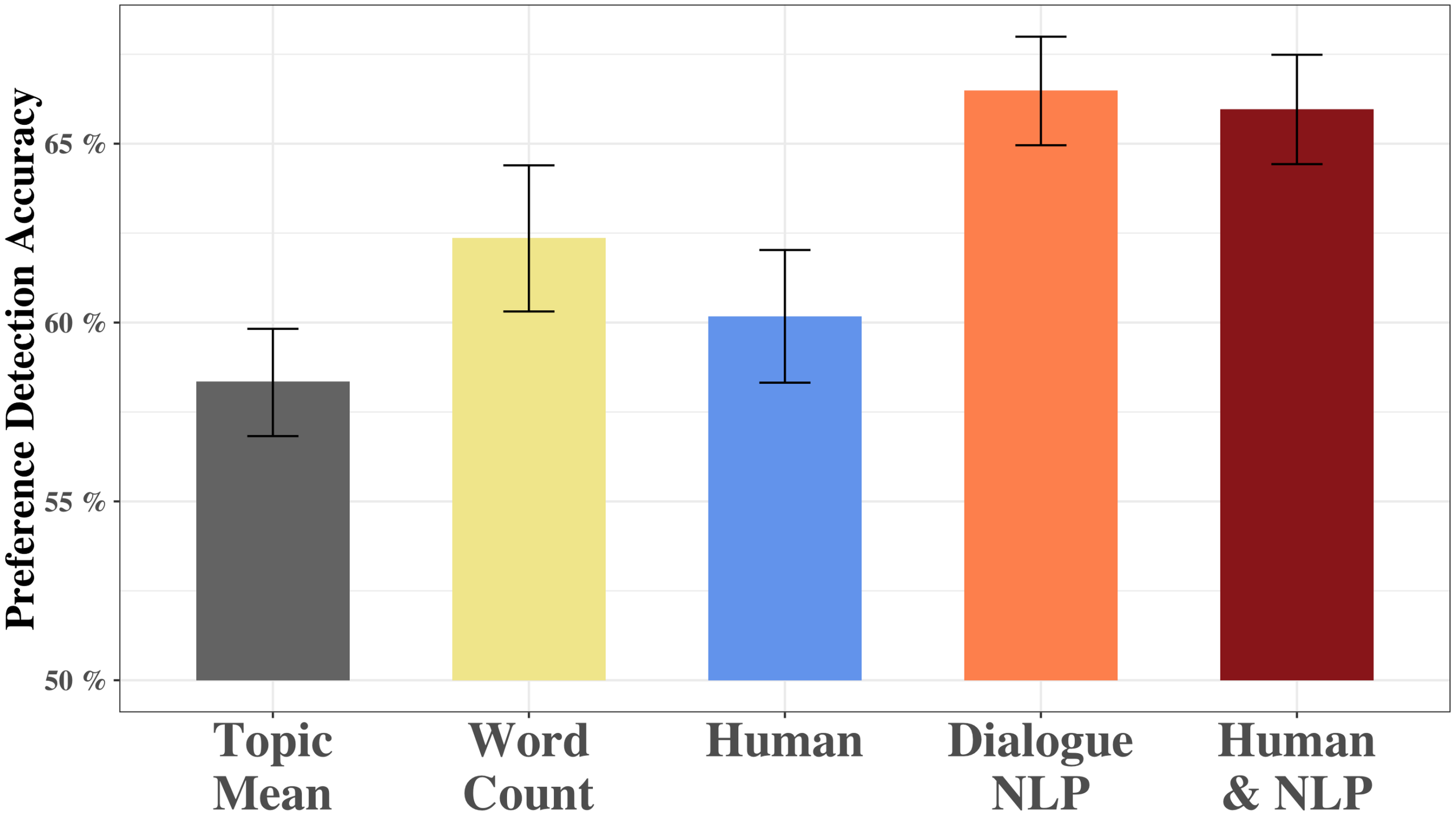

Research Questions

Do we learn other people's topic preferences from what they say?

Not well - we can be egocentric, overconfident, and oblivious

Does the flow of new topics affect our enjoyment of conversations?

Conversation can be more enjoyable with frequent topic switching together

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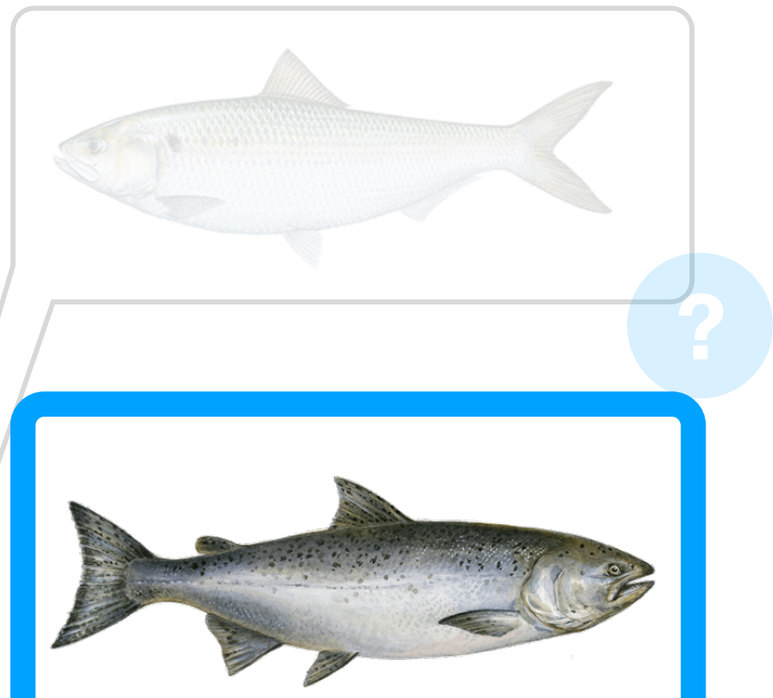
Inertia of the Current Topic



Topic Switch Empowerment

Topic Switch Empowerment

Study 3	**Study 4**
face-to-face (n=196)	online chat room (n=678, pre-registered)
given 12-topic list	no topic list
Two dyad-level conditions	Third condition: mixed dyads

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Treatment: Topic-Switching Instructions

frequent switching vs. natural switching

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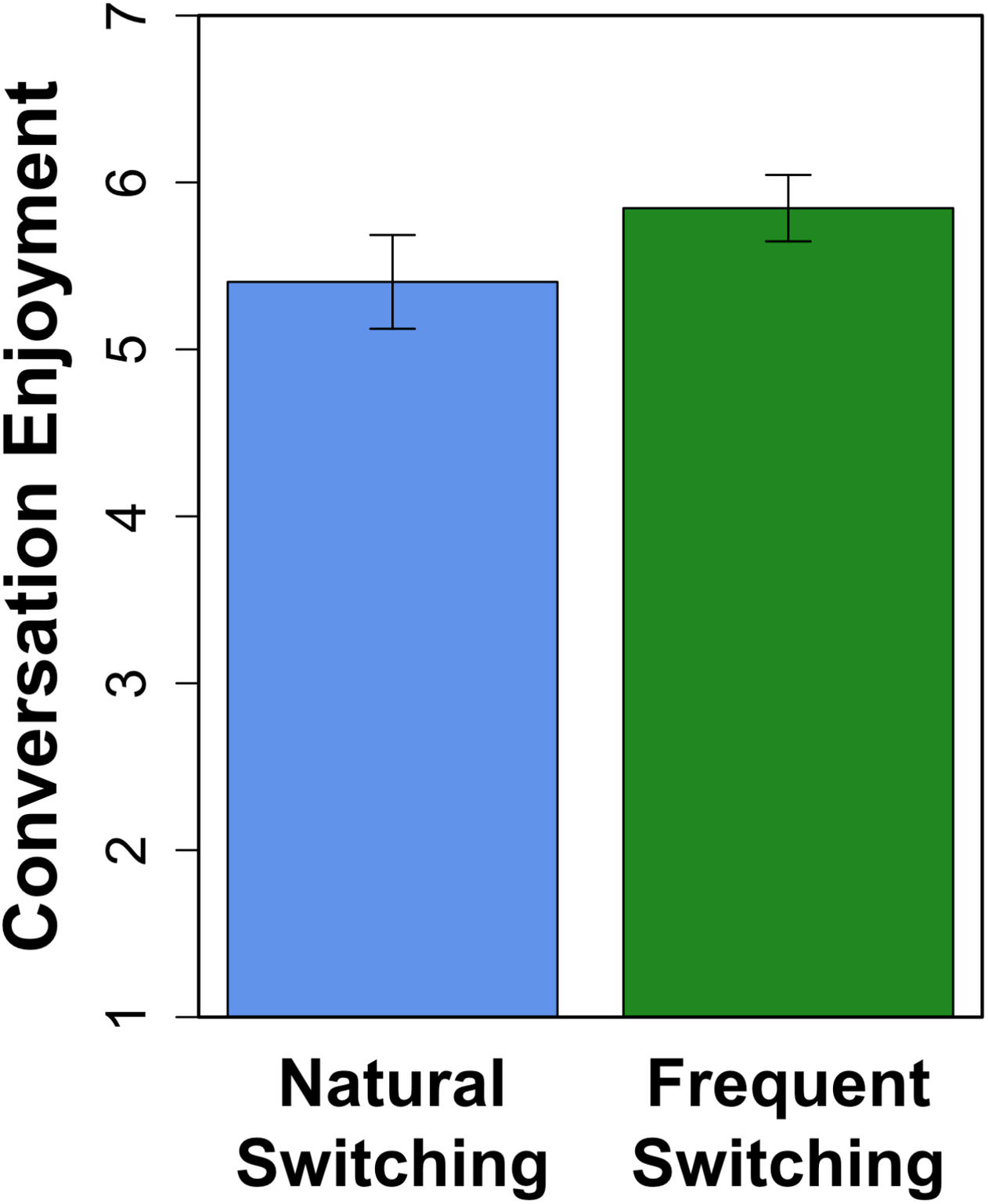
Treatment: Topic-Switching Instructions

frequent switching vs. natural switching

Primary Outcome: Enjoyment (1-7 likert, α=.89)

I enjoyed this conversation.
I thought this conversation was engaging.
I had an interesting conversation with this person.
I felt happy during this conversation.
I was watching the clock, wishing time would pass more quickly.

Study 3 Outcomes



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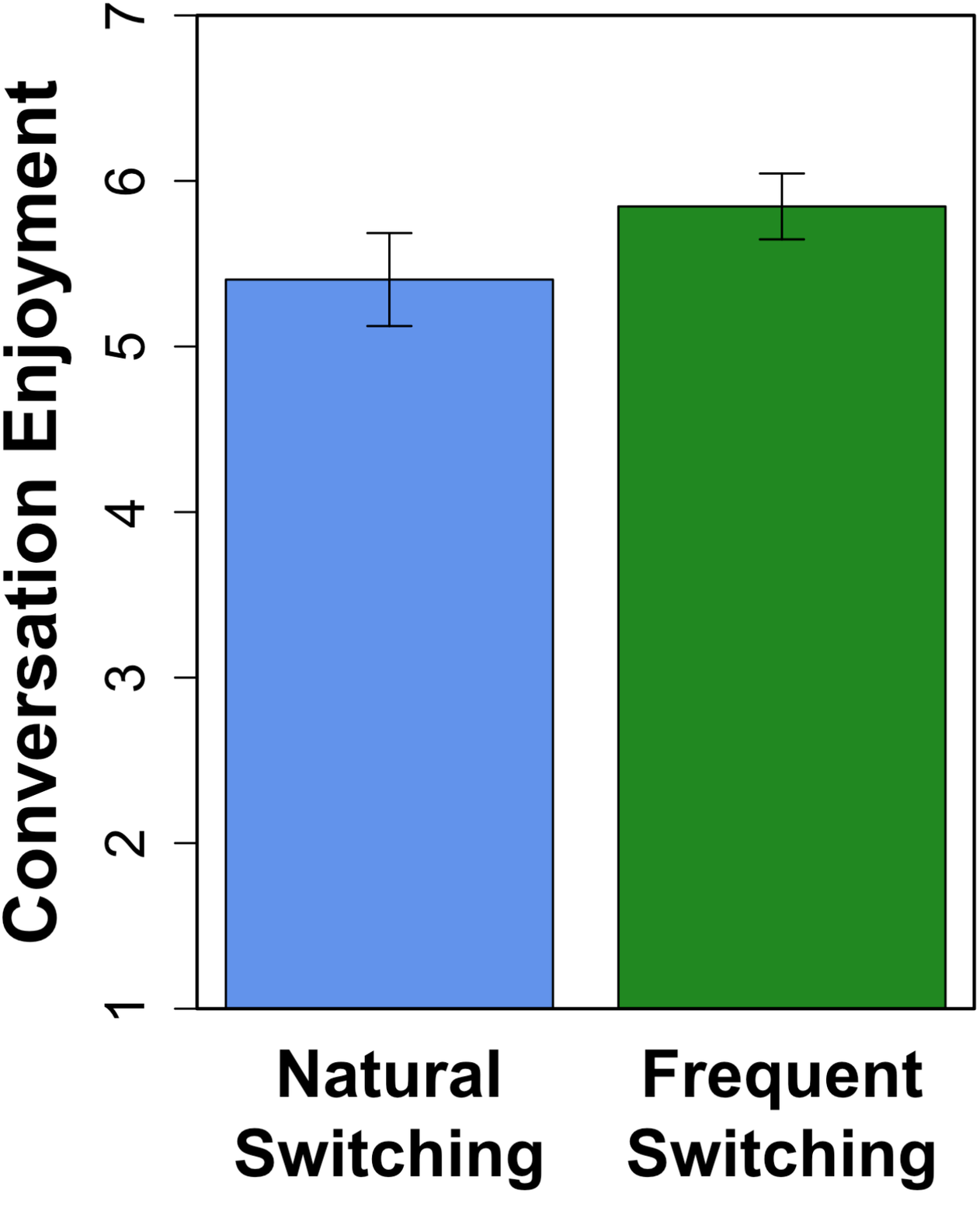
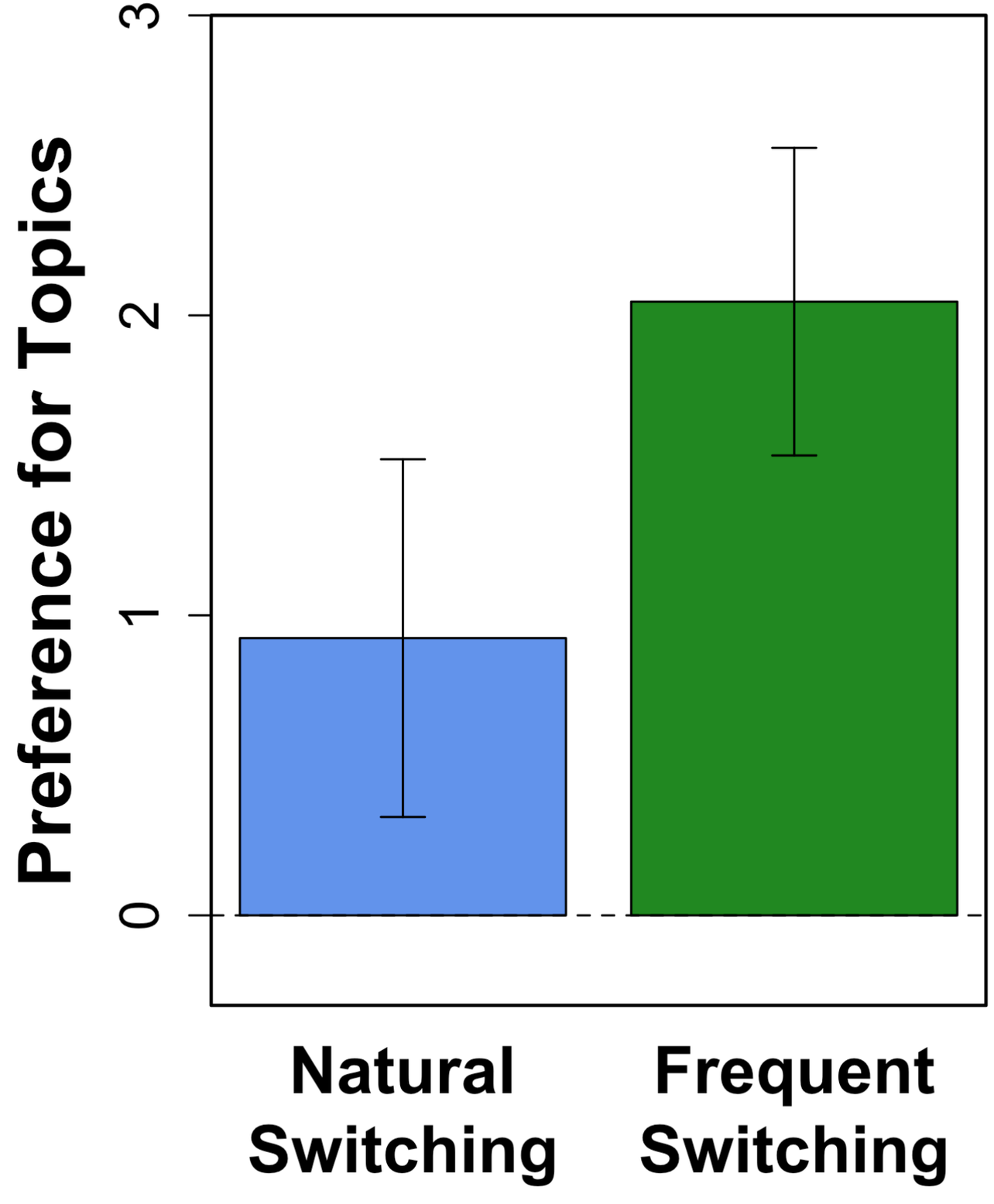
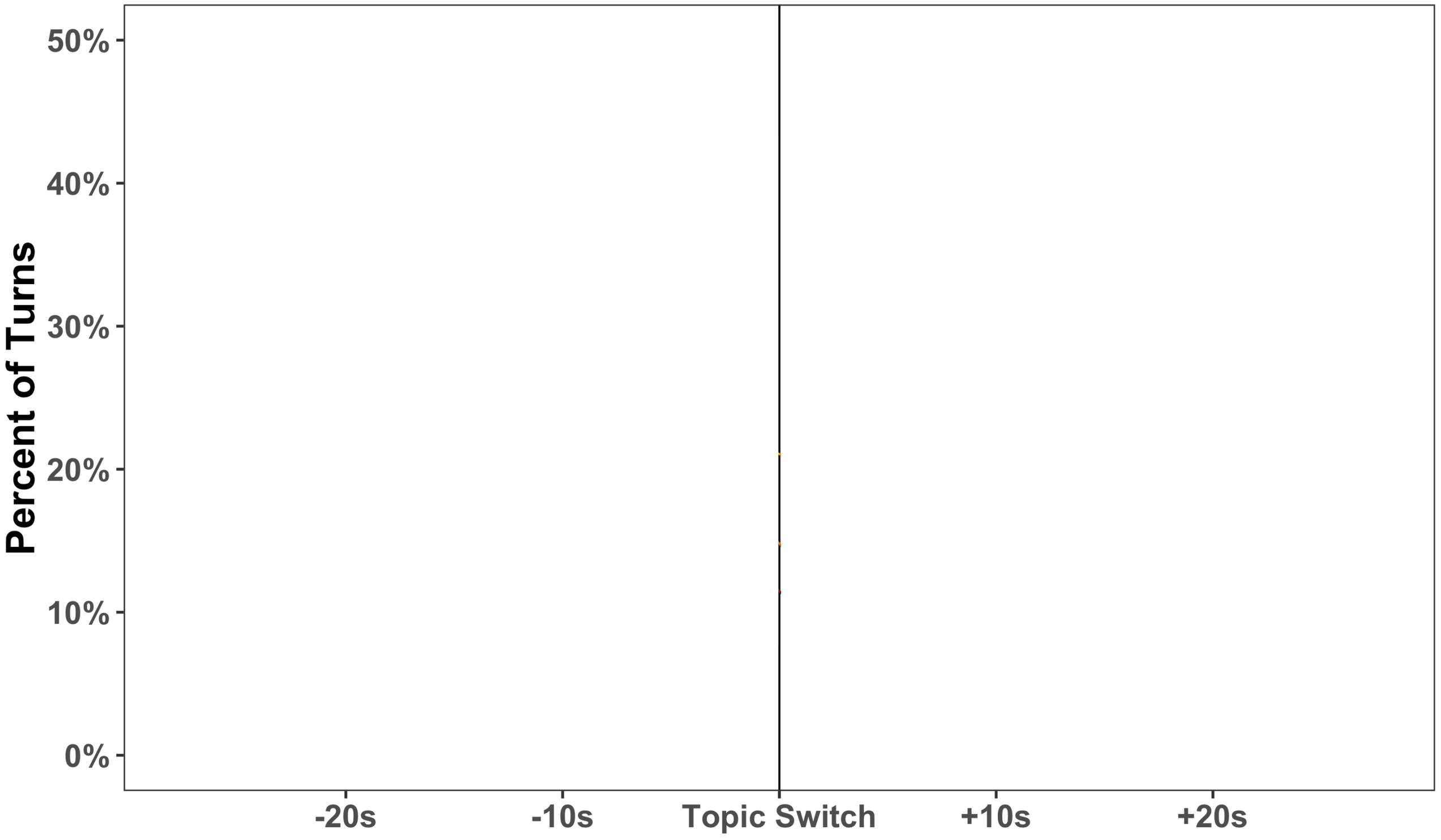




Inter-Turn Silences



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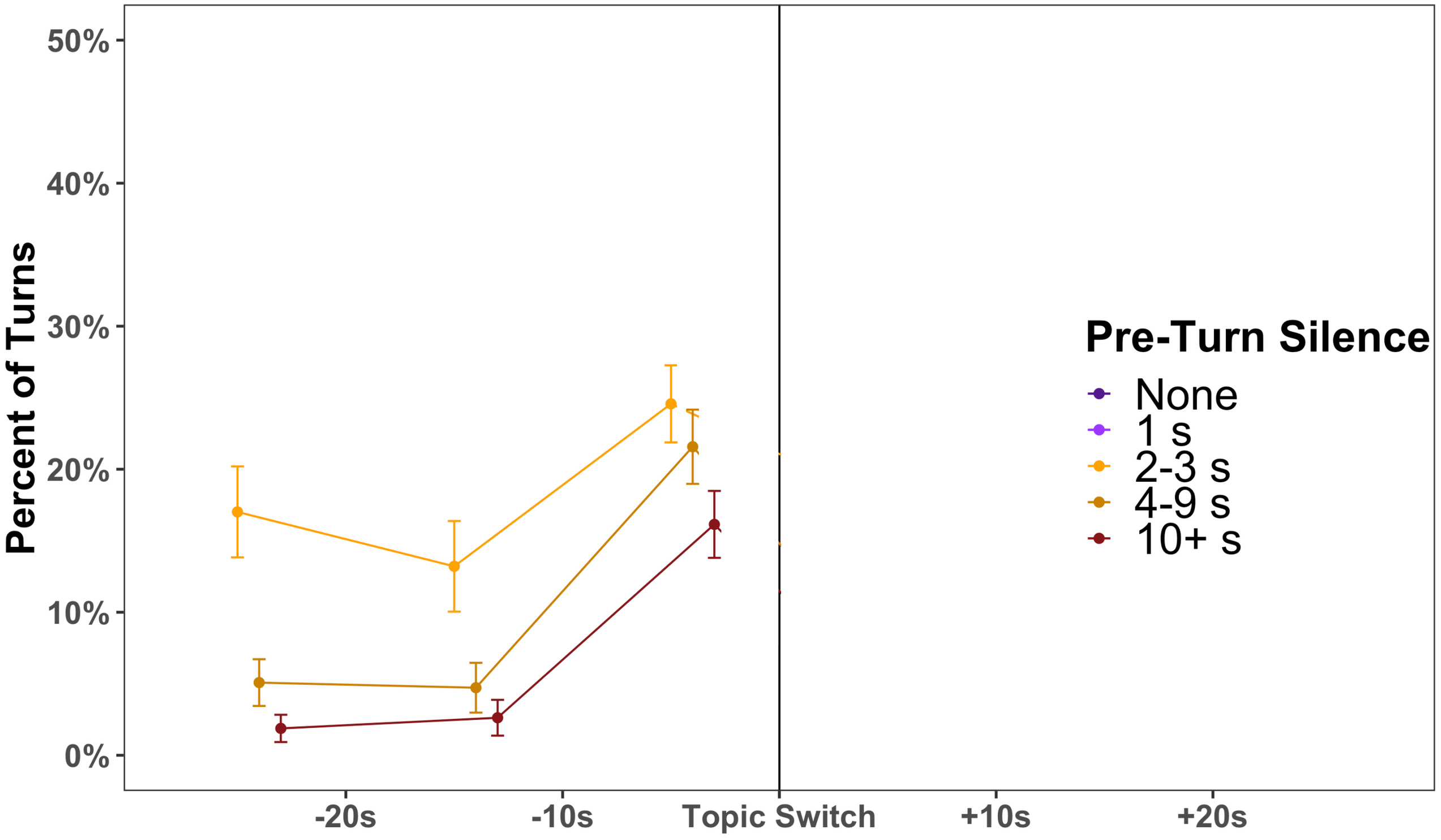

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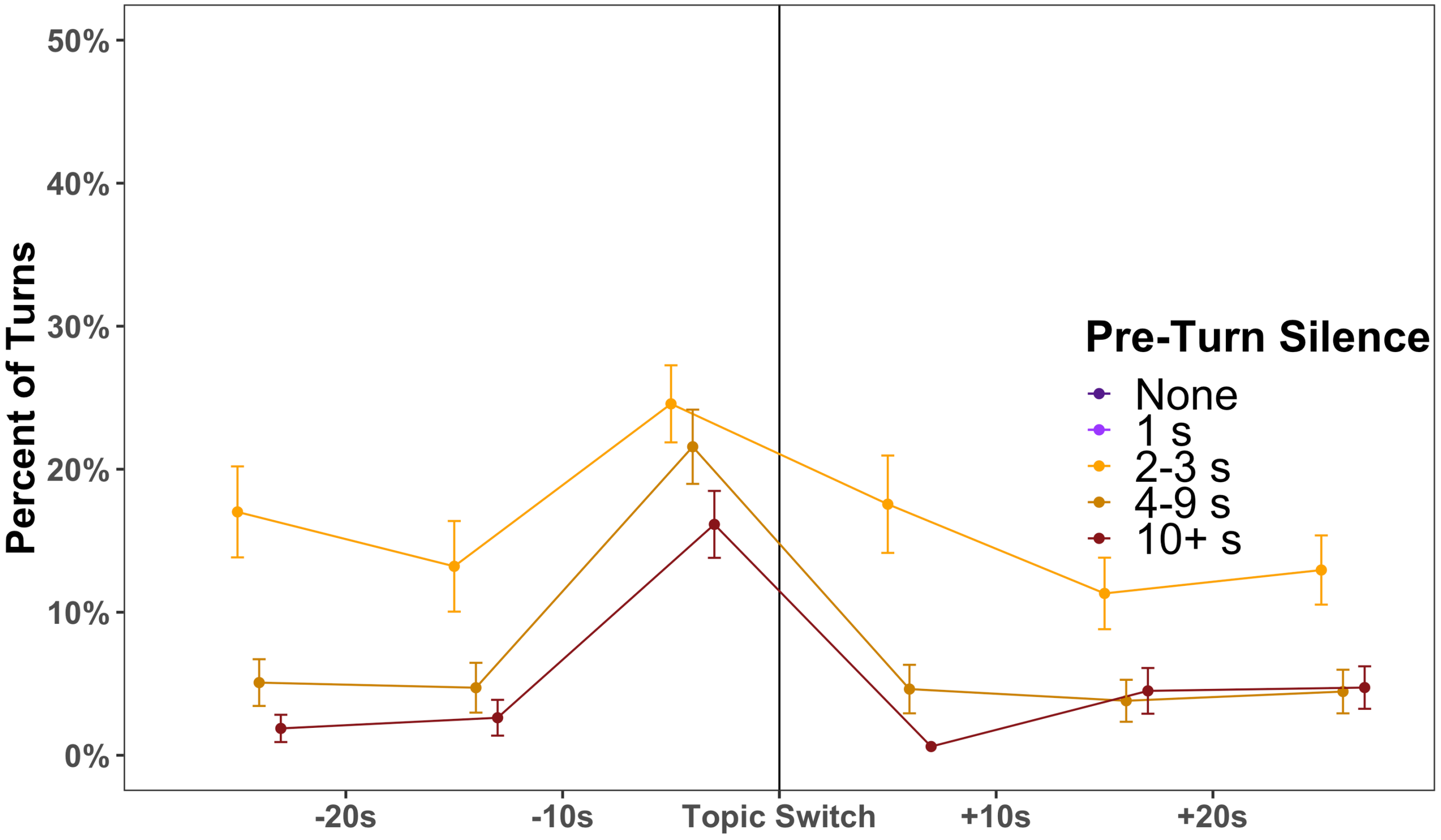

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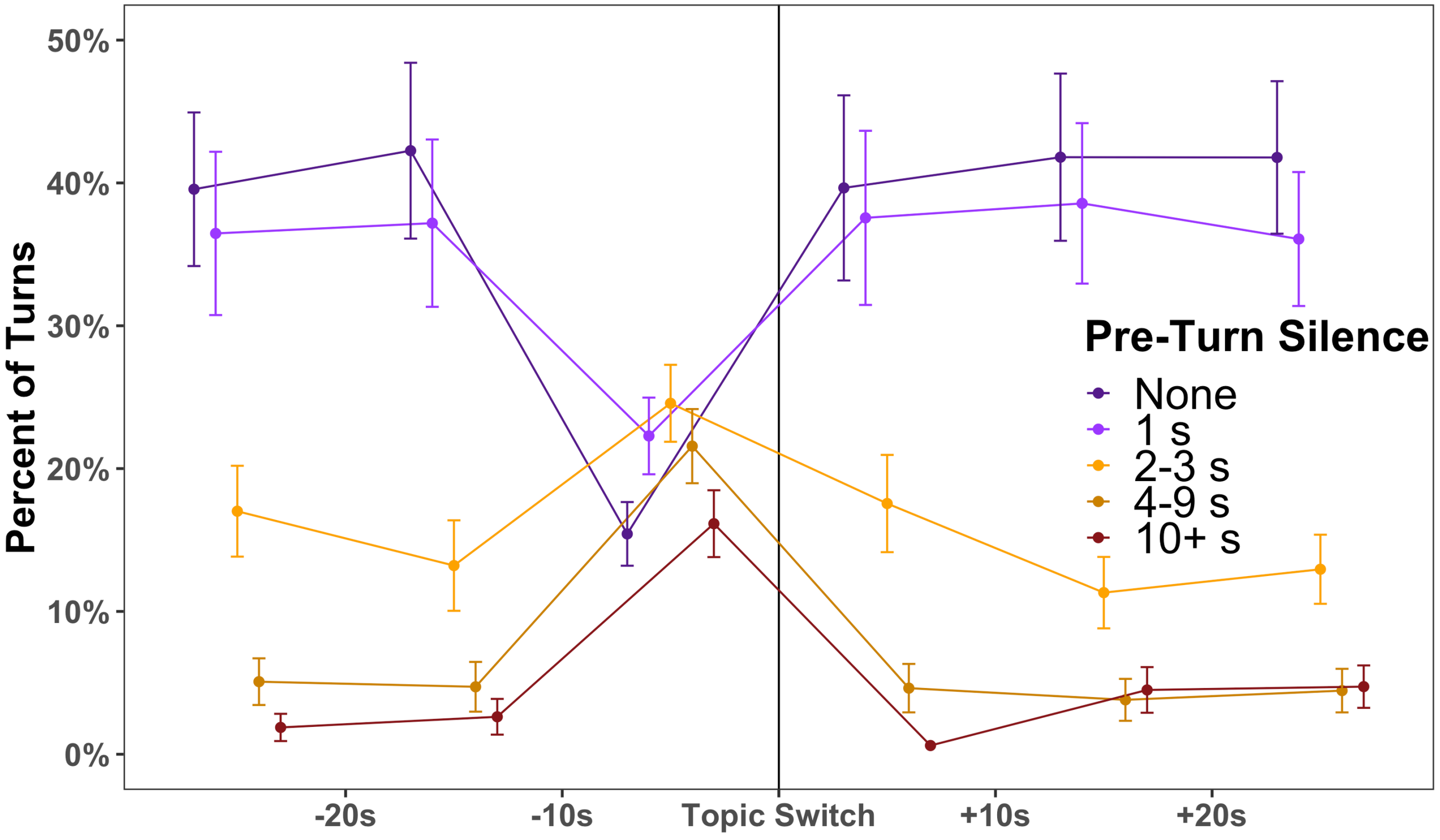

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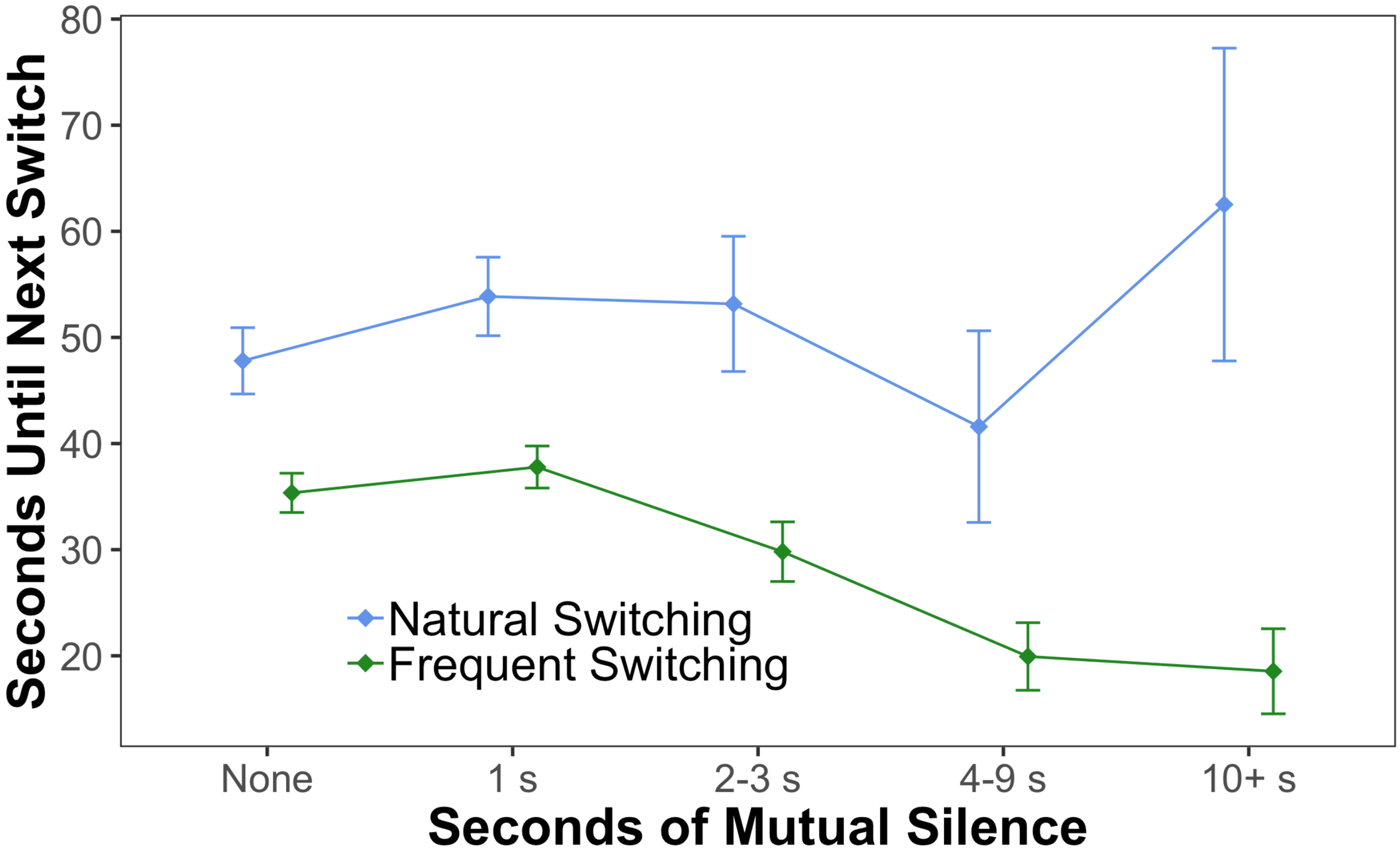

Study 4 Design

Pre-registered Replication

- 678 mTurkers in dyads
- 10min online chat
- No topic list

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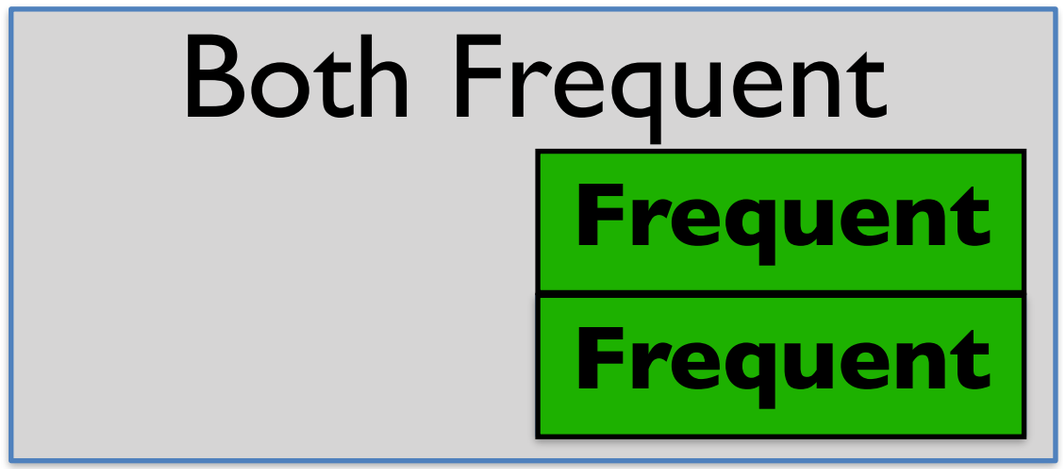

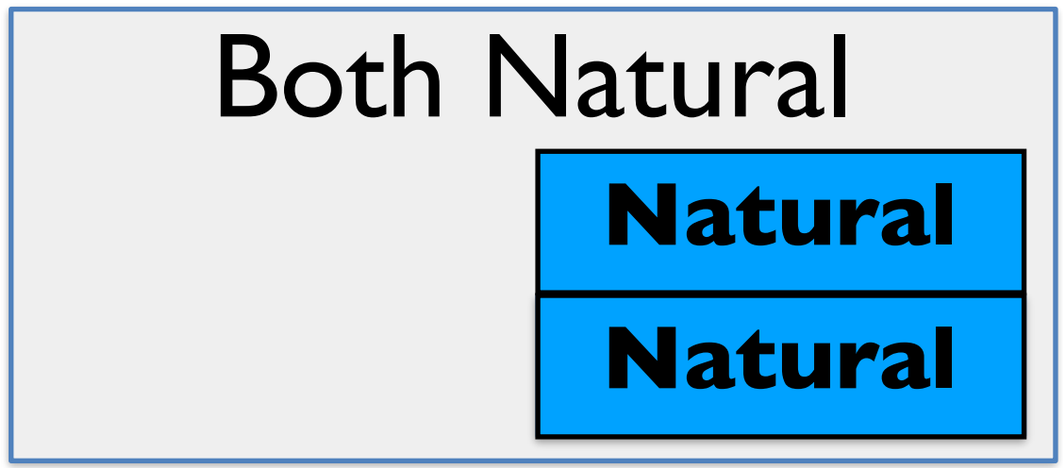

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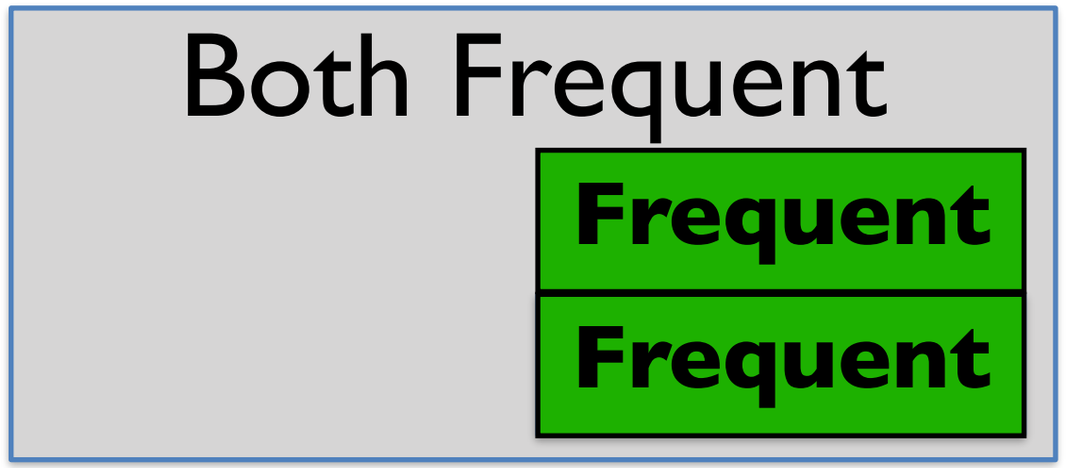
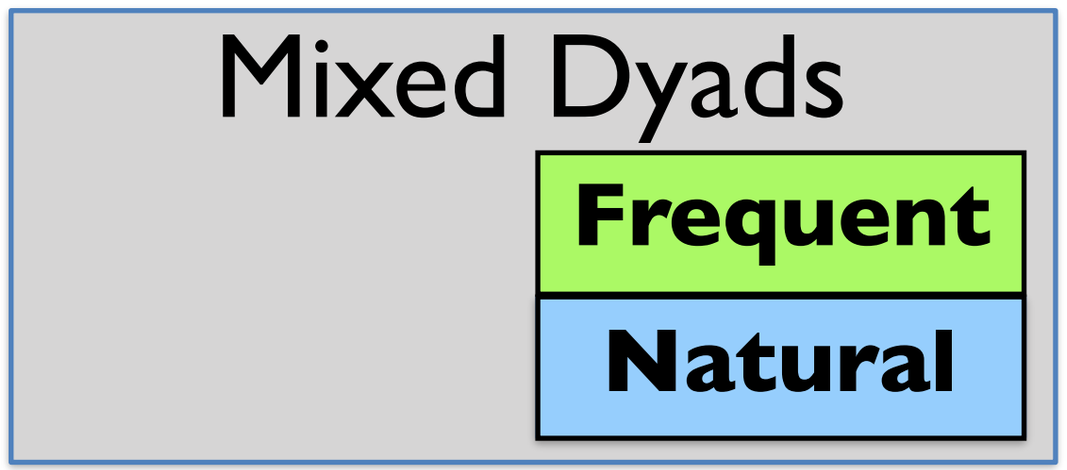
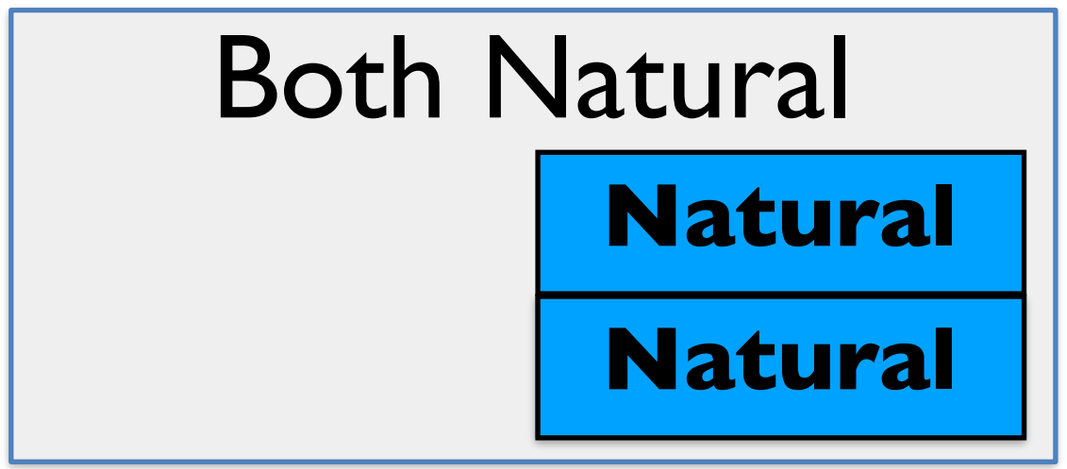
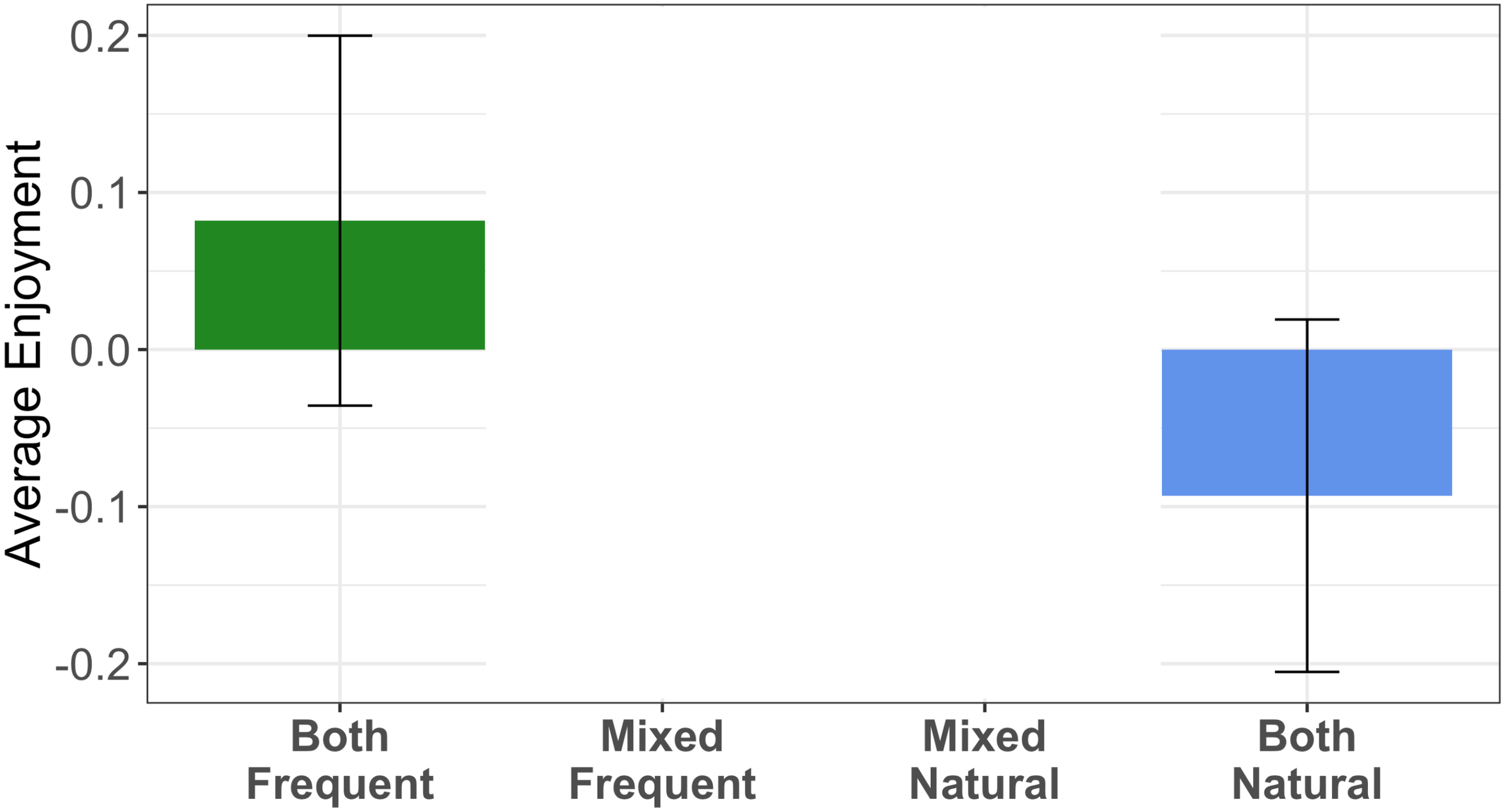


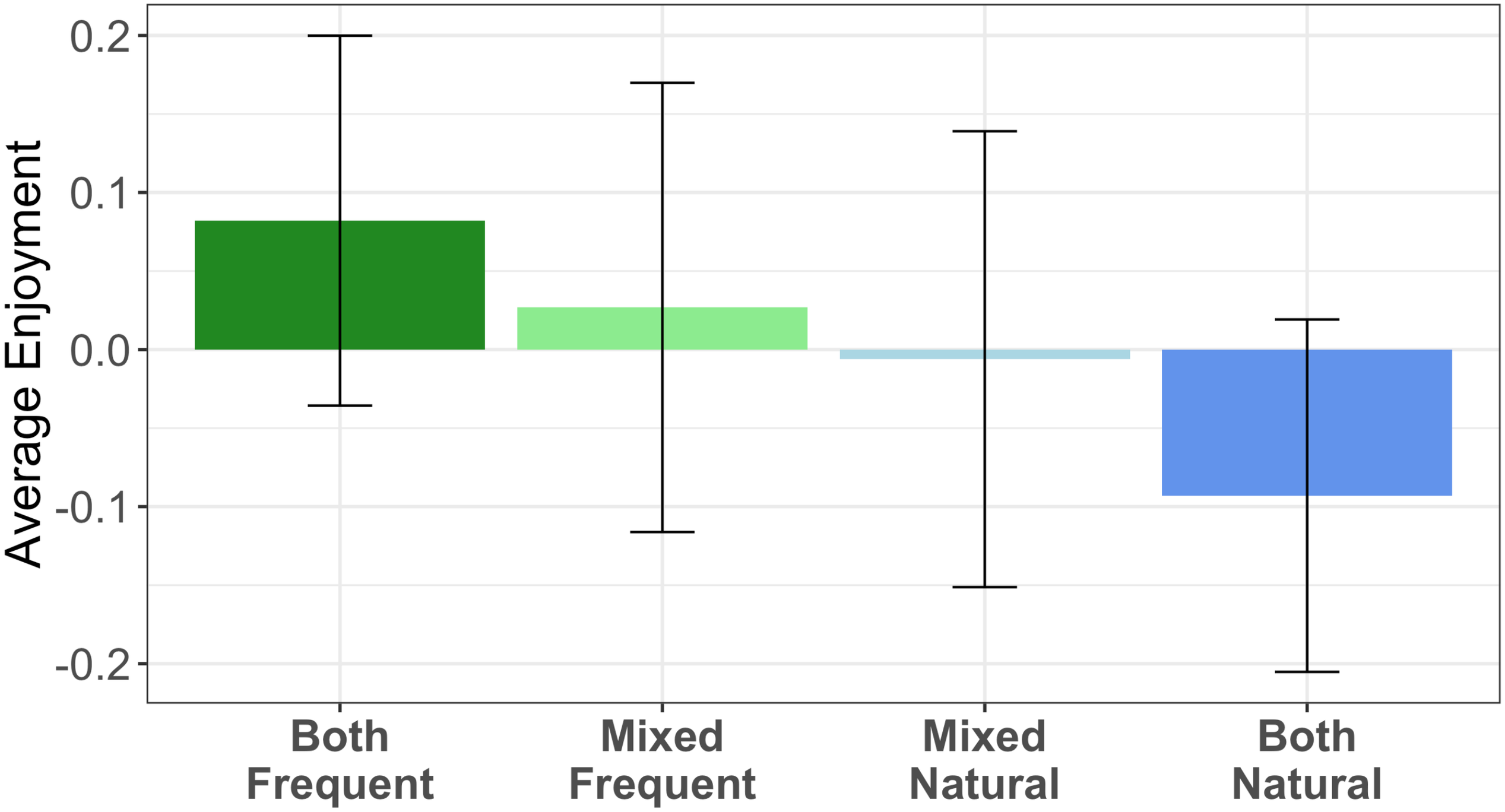




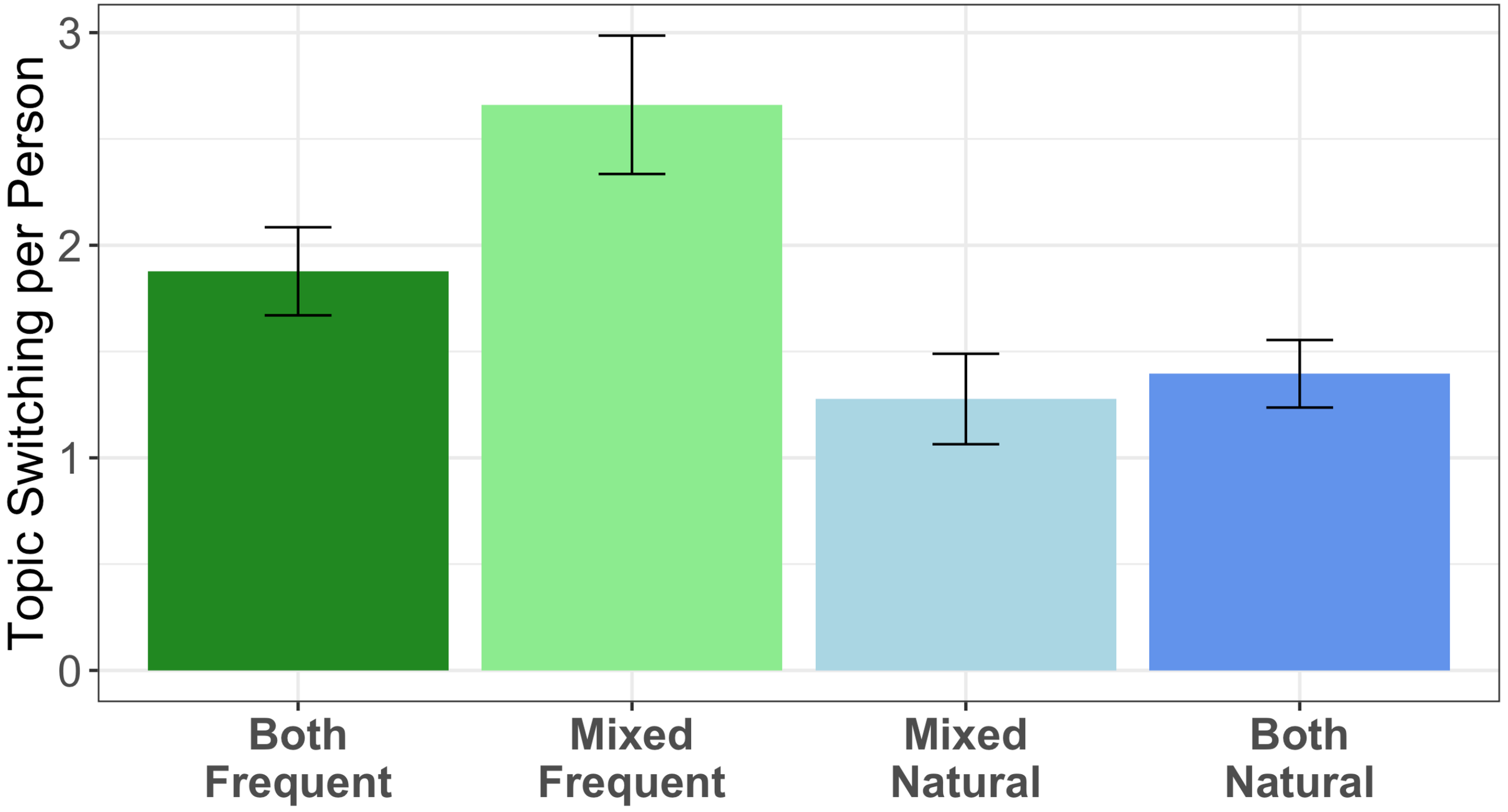
Study 4 Enjoyment



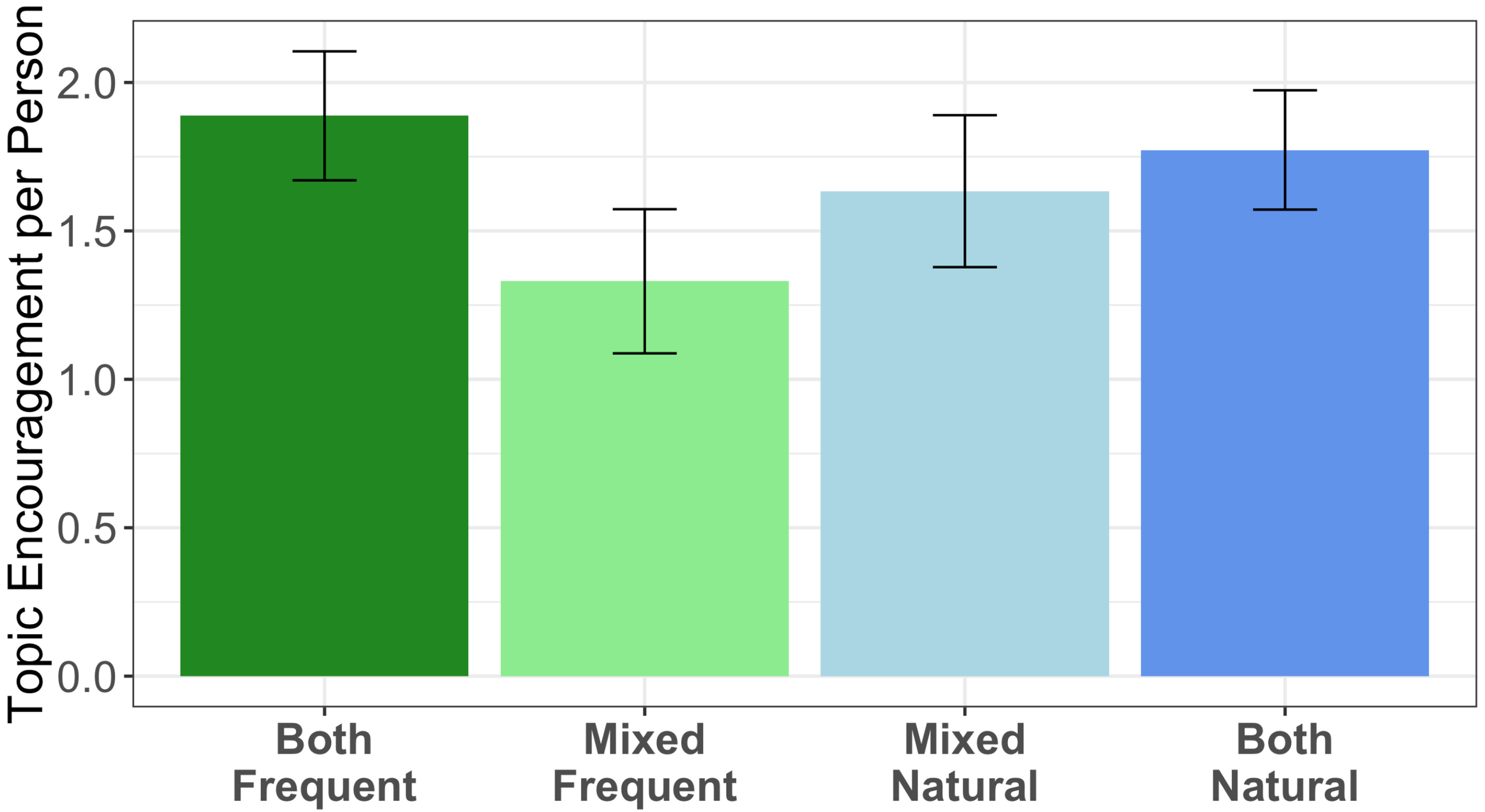
Study 4 Enjoyment



Topic Switches



Topic Encouragement



Perspective-Taking Tasks

Perspective-Taking Tasks

Perceptual

Personal

Perspective-Taking Tasks

Perspective-Taking Tasks

6

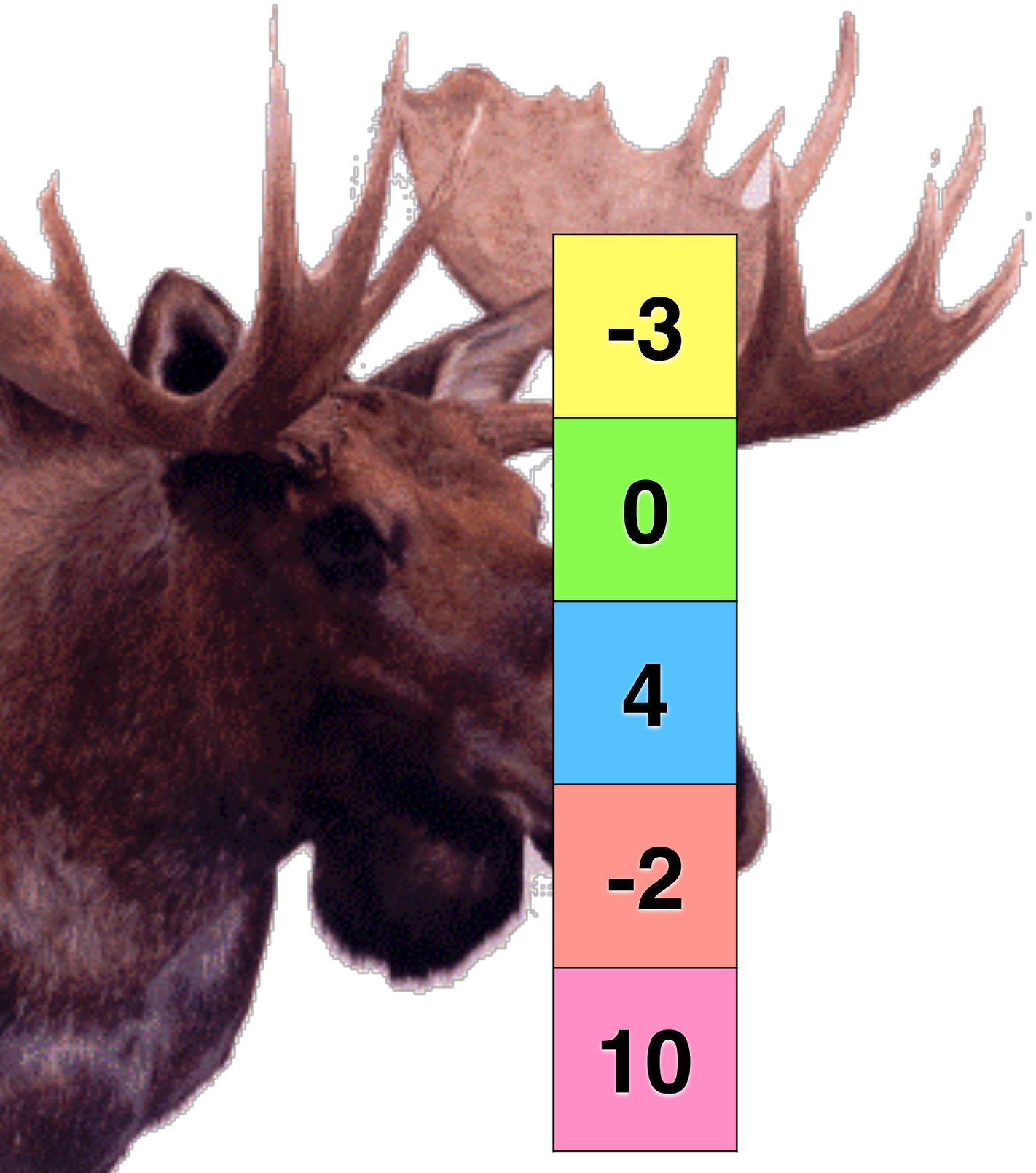
8

3

9

1

Perspective-Taking Tasks



Future Directions

Topic Preference Explicitness

Future Directions

Topic Preference Explicitness

Switch Empowerment

Future Directions

Topic Preference Explicitness

Switch Empowerment

Topic Plan-Making

Future Directions

Topic Preference Explicitness

Switch Empowerment

Topic Plan-Making

Leaving: the ultimate topic switch

Thank You!

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