

# Partisan Disbelief in Polarized Societies: Evidence from South Korea and the U.S.

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- Today: **Disbeliefs in out-group knowledge** & **Bias in Information Processing**

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  - Treatment: Tell "Actual accuracy rates are the same across Repub and Democ"
4. Can correcting **disbelief** also reduce affective polarization?

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## 4. Correcting disbelief reduces affective polarization, albeit inconclusive

# Today's Plan

## Surveys, Background

### Study 1. Baseline Evidence of Disbelief

Survey Design and Hypotheses

Existence of Disbelief on Out-group's Knowledge

### Study 2. Correcting Disbelief

Survey Design and Hypotheses

H1: Treatment Effects on Disbelief

H2: Existence of In-group Bias in Information Processing

H3: Treatment Effects of Correcting Disbelief on In-group Bias

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# Surveys

- US and South Korea
- Two surveys
  - Study 1 ( $N \approx 1,500$ ): Document disbelief in out-group knowledge
  - Study 2 ( $N \approx 4,200$ ):
    - Document in-group bias in belief updating
    - Experiment if correcting disbelief reduces the in-group bias
- Recruit participants through an online survey panel provider

# Background/Accronym/Abbreviation

- RP: Right-wing parties
  - US: Republican Party-current majority + president
  - SK: People's Power Party (PPP)
- LP: Left-wing parties
  - US: Democratic Party
  - SK: Democratic Party of Korea (DPK)-current majority + president
- NP: Non-partisans
- Drop others in SK: 273/300 in National Assembly = PPP or DPK

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## Study 1: Survey Structure (N=1,500)

- Ask to evaluate (T or F) 8 factual questions:
- Examples
  - "New Zealand is located in the Middle East."
  - "The country's GDP growth rate in the previous year was lower than 7%."
- Ask to give confidence level
- Then, for each question, ask to estimate the accuracy rates for three groups
  - $p_{i,j}^t$ : individual  $i$ 's estimate on group  $t$ 's accuracy rate on task  $j$
  - $t \in \{RP, DP, NP\}, j = 1, \dots, 8$

**Q26 Please judge whether the sentence is true or false: New Zealand is located in the Middle East.**

True (1)

False (2)

**Q27** We would like you to estimate how confident you are in the accuracy of your answer to the true-or-false question. For example, if you believe there is a 50% chance that your answer is correct, please choose 50. If you are completely confident that your answer is correct, please choose 100.

0	10	20	30	40	50	60	70	80	90	100
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Accuracy of your answer ()



**Q28** Next, we would like you to estimate **the percentage of people in each of the following groups who correctly judge whether the statement is true or false**. For example, if everyone in group X makes the correct judgement, the percentage of group X would be 100%.

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Republican Party supporters ()



Democratic Party supporters ()



## Hypotheses: Disbelief in out-group knowledge

- Target-based Disbelief
  - RP supporters believe that RP supporters are more knowledgeable
  - LP supporters believe that LP supporters are more knowledgeable
  - Non-partisans believe that RP and LP supporters are equally knowledgeable

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- Target-based Disbelief
  - RP supporters believe that RP supporters are more knowledgeable
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- Perceiver-based Disbelief
  - RP supporters are seen as more knowledgeable by RP than LP
  - LP supporters are seen as more knowledgeable by LP than RP
  - NP supporters are seen as equally knowledgeable by LP and RP

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- Perceiver-based Disbelief
  - RP supporters are seen as more knowledgeable by RP than LP
  - LP supporters are seen as more knowledgeable by LP than RP
  - NP supporters are seen as equally knowledgeable by LP and RP
- Today: focus on Target-based Disbelief (both are almost identical)

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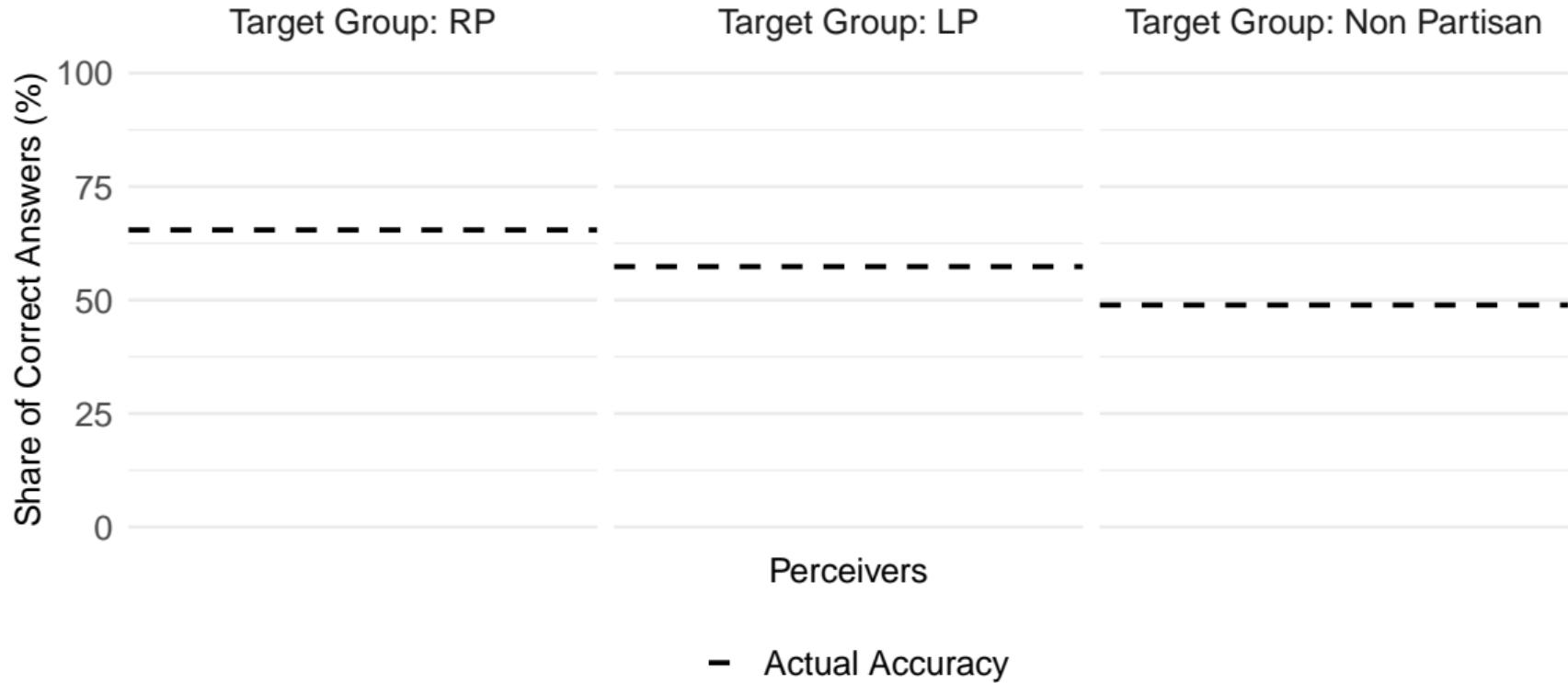
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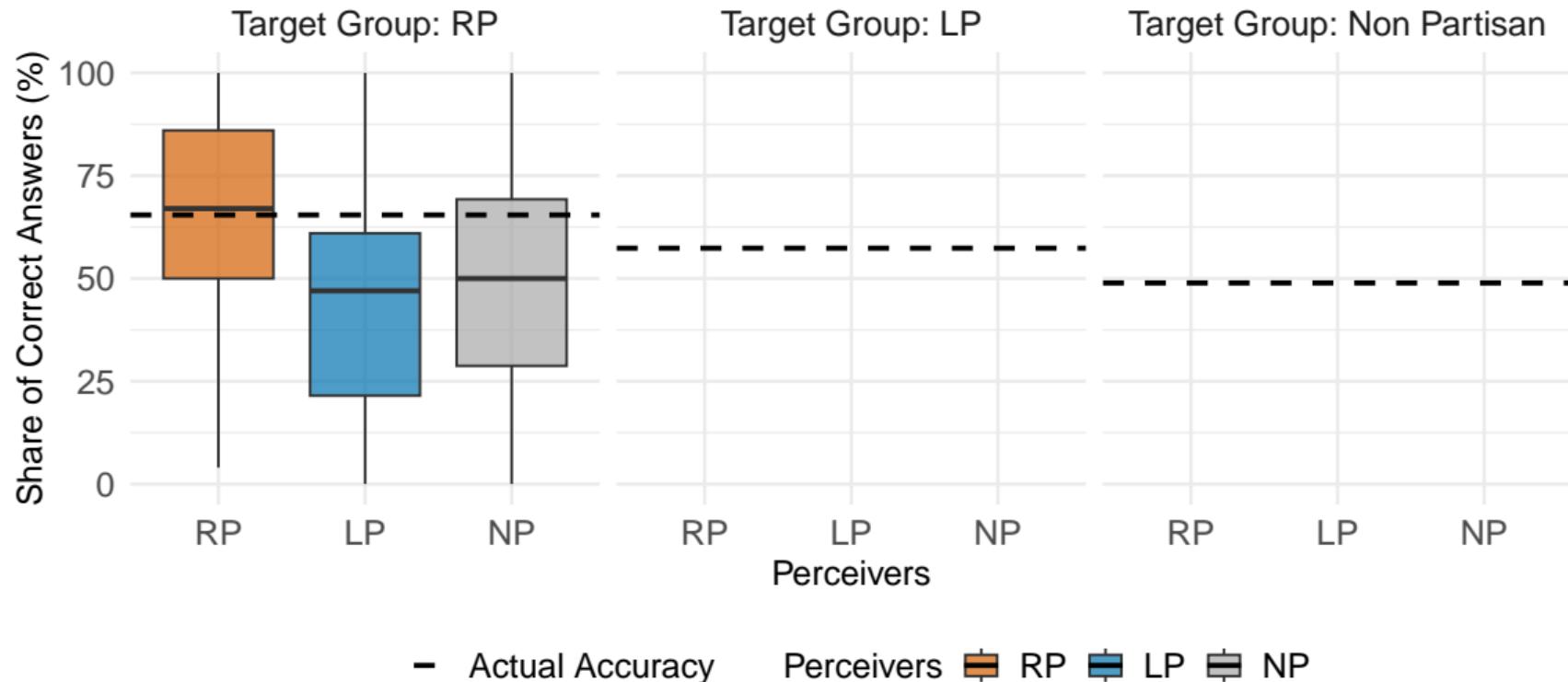
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**Fact 3 : The country's nominal GDP growth rate in the previous year was lower than 7%.**



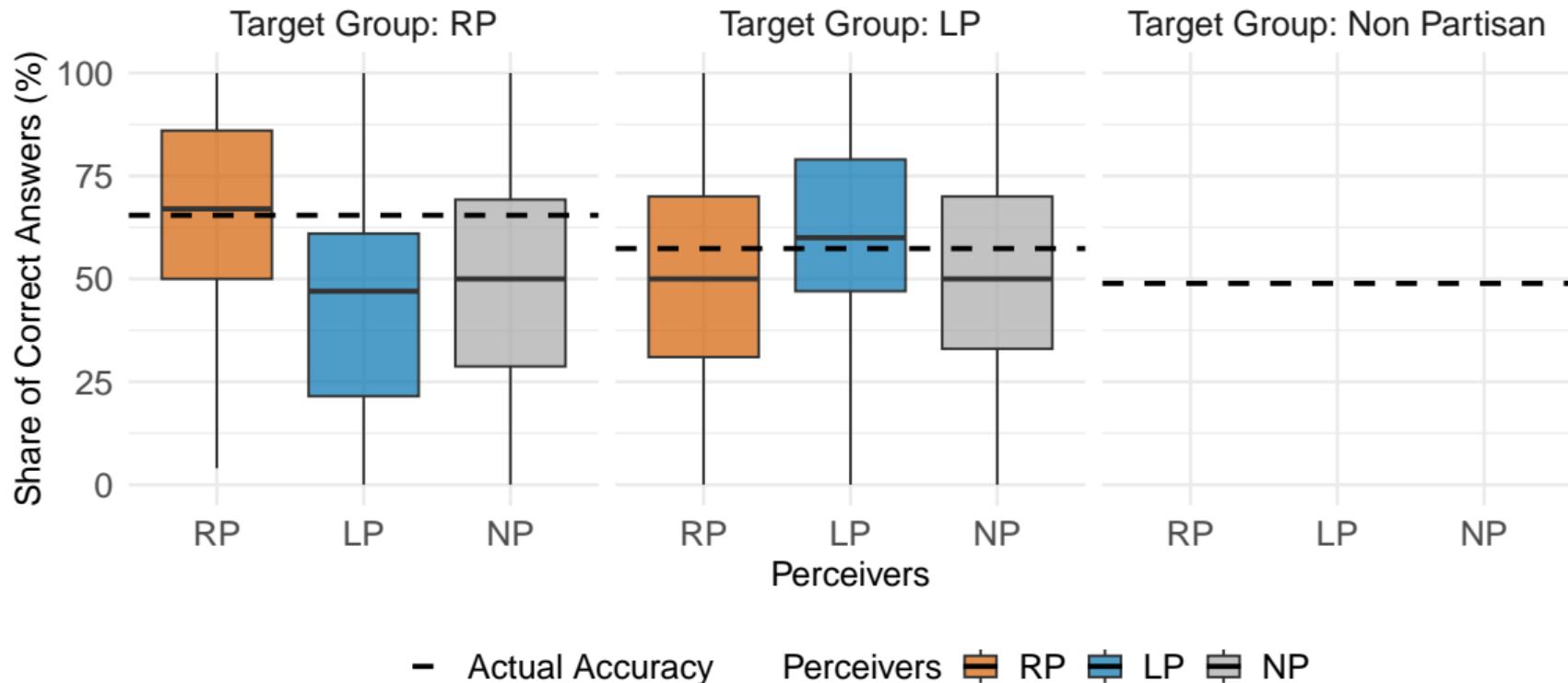
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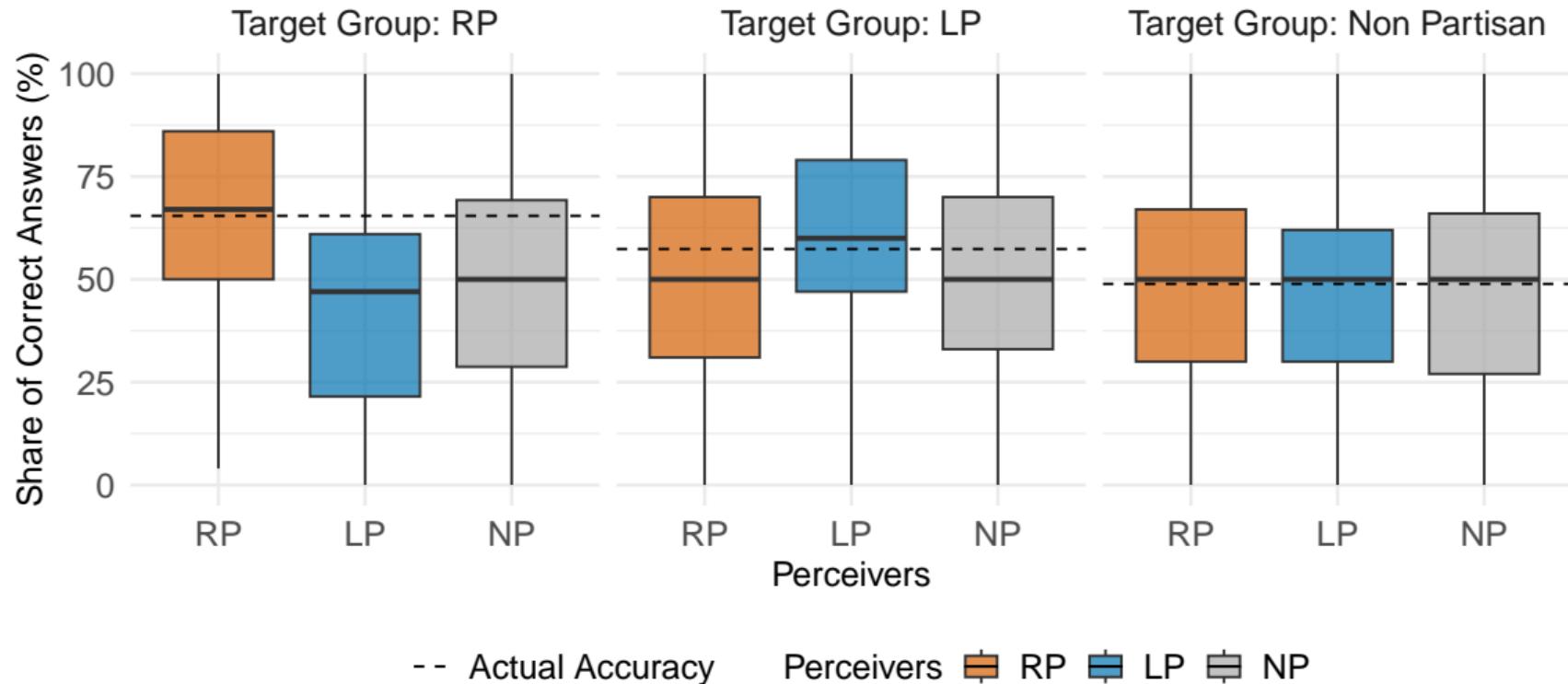
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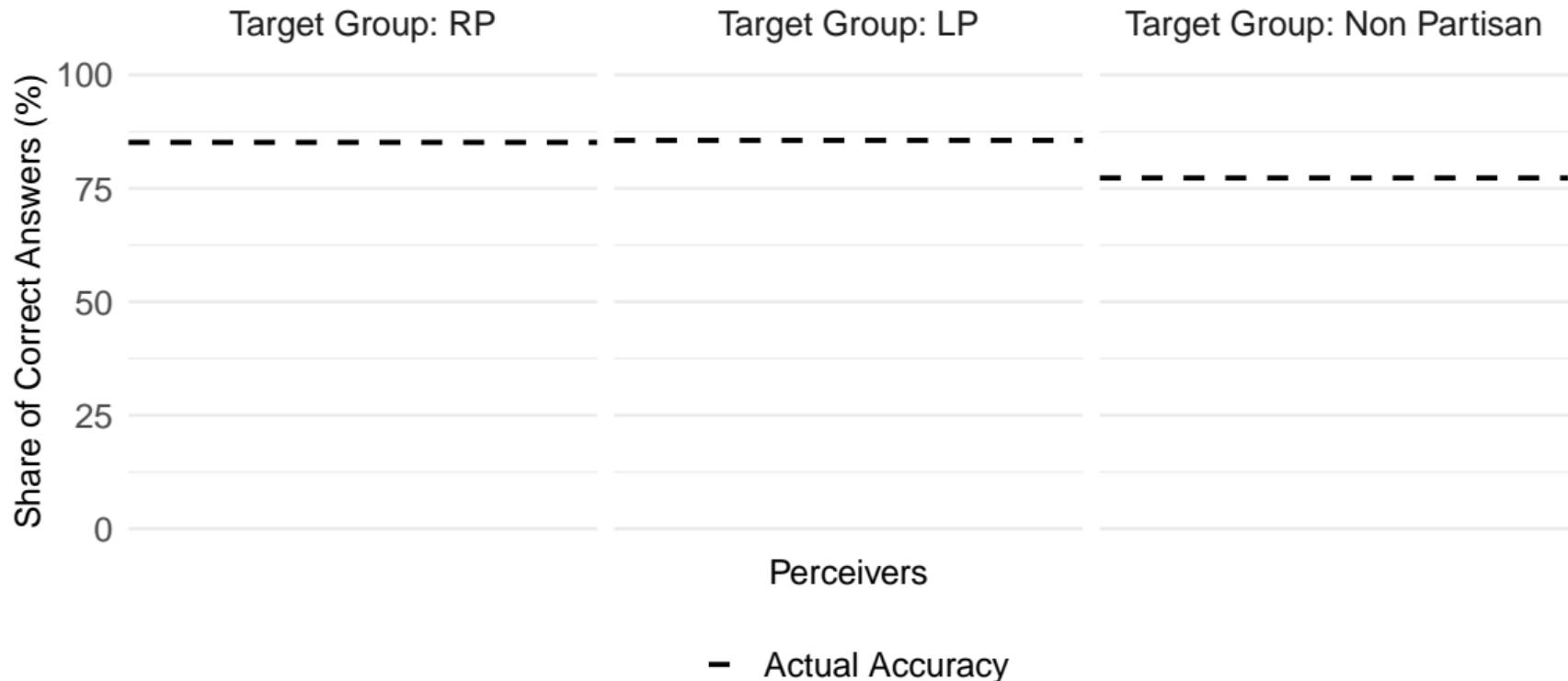
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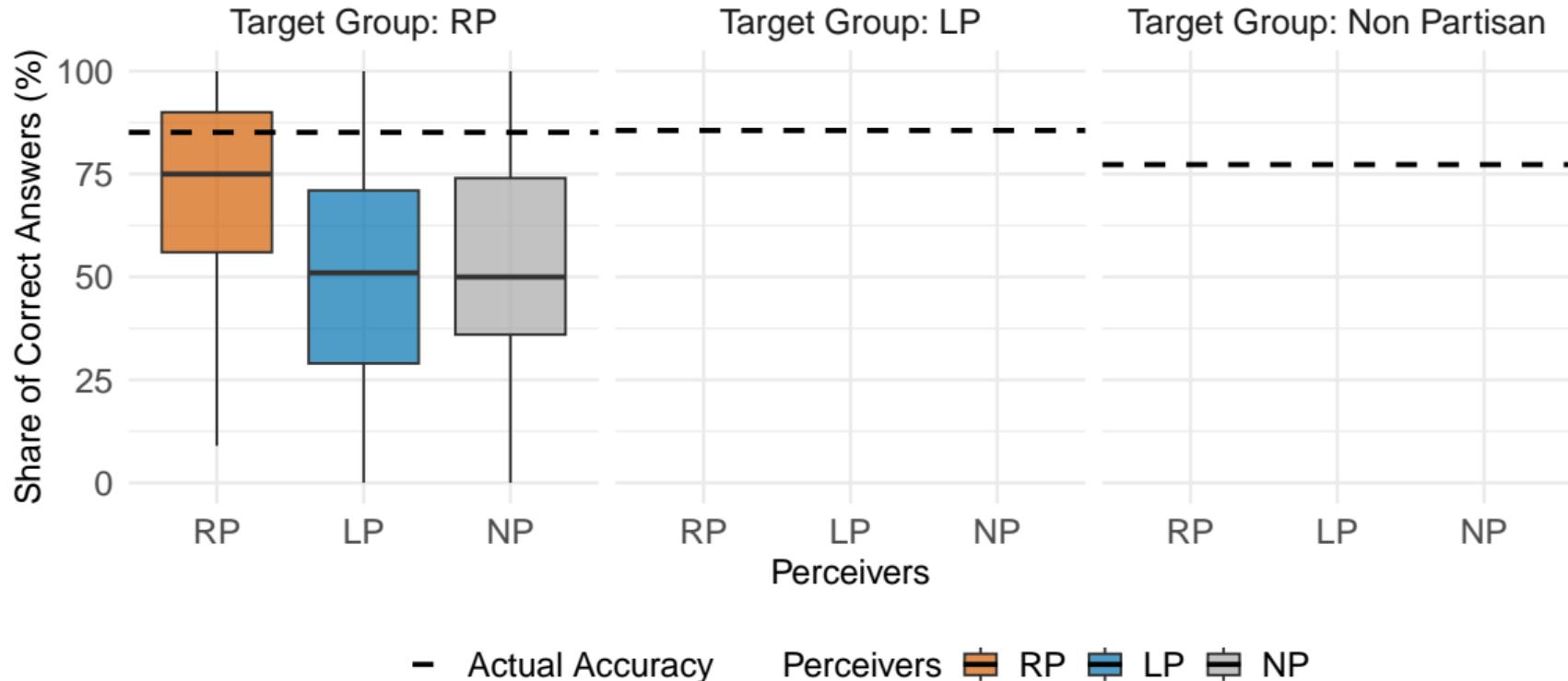
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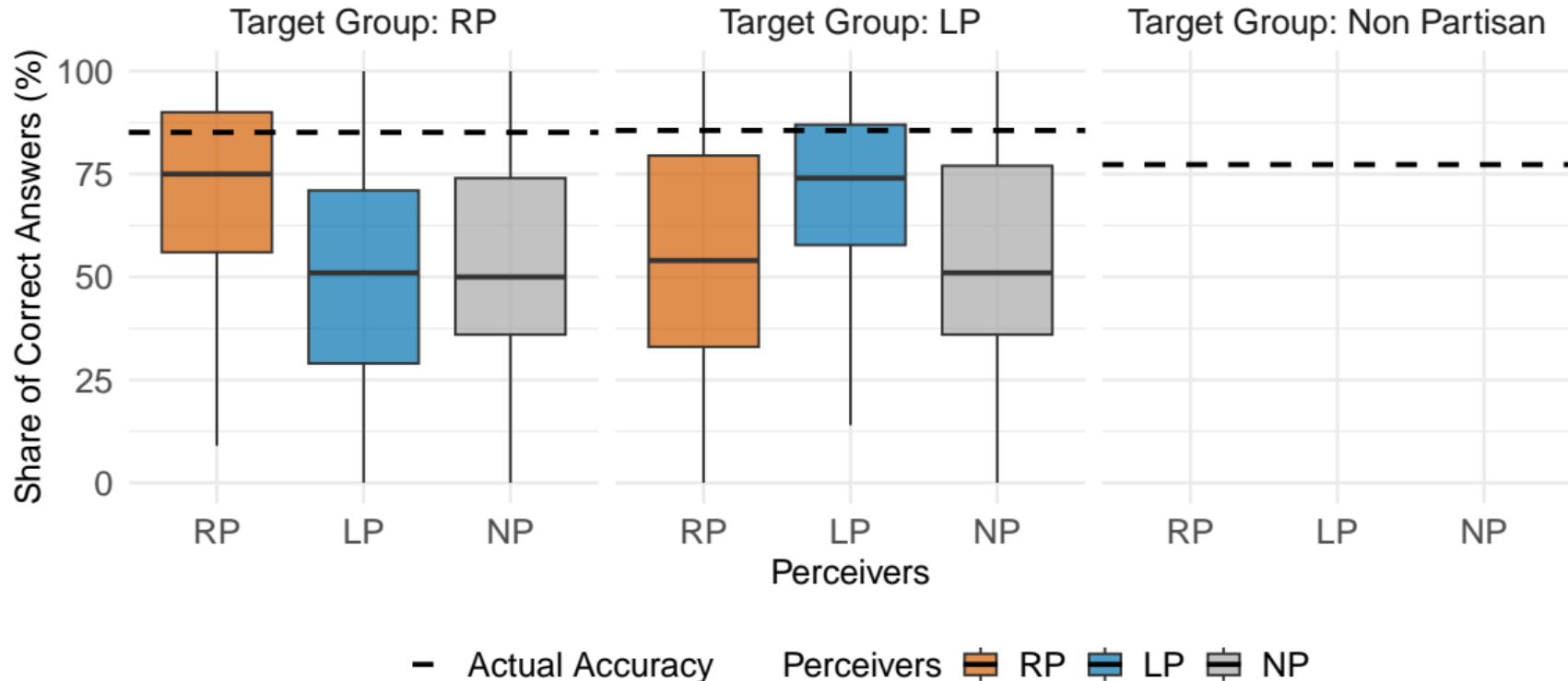
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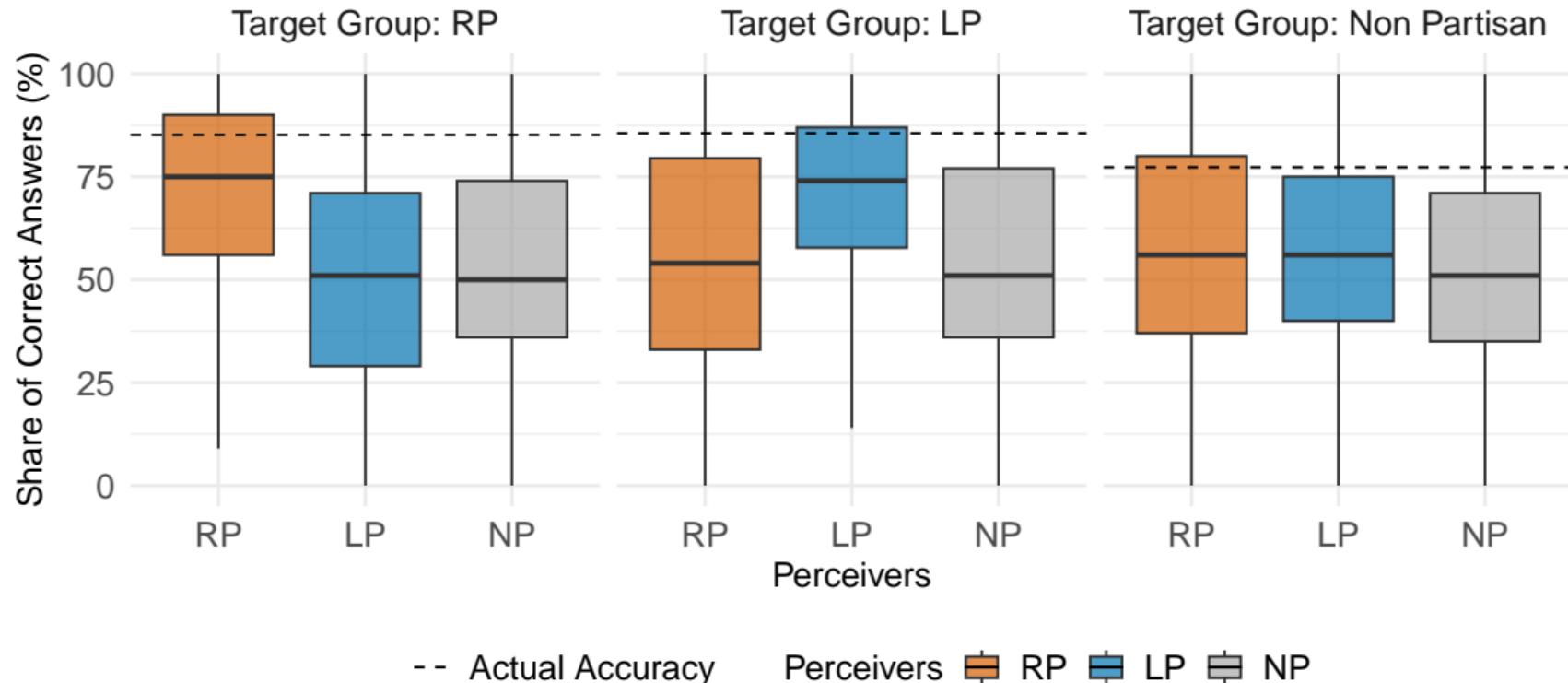
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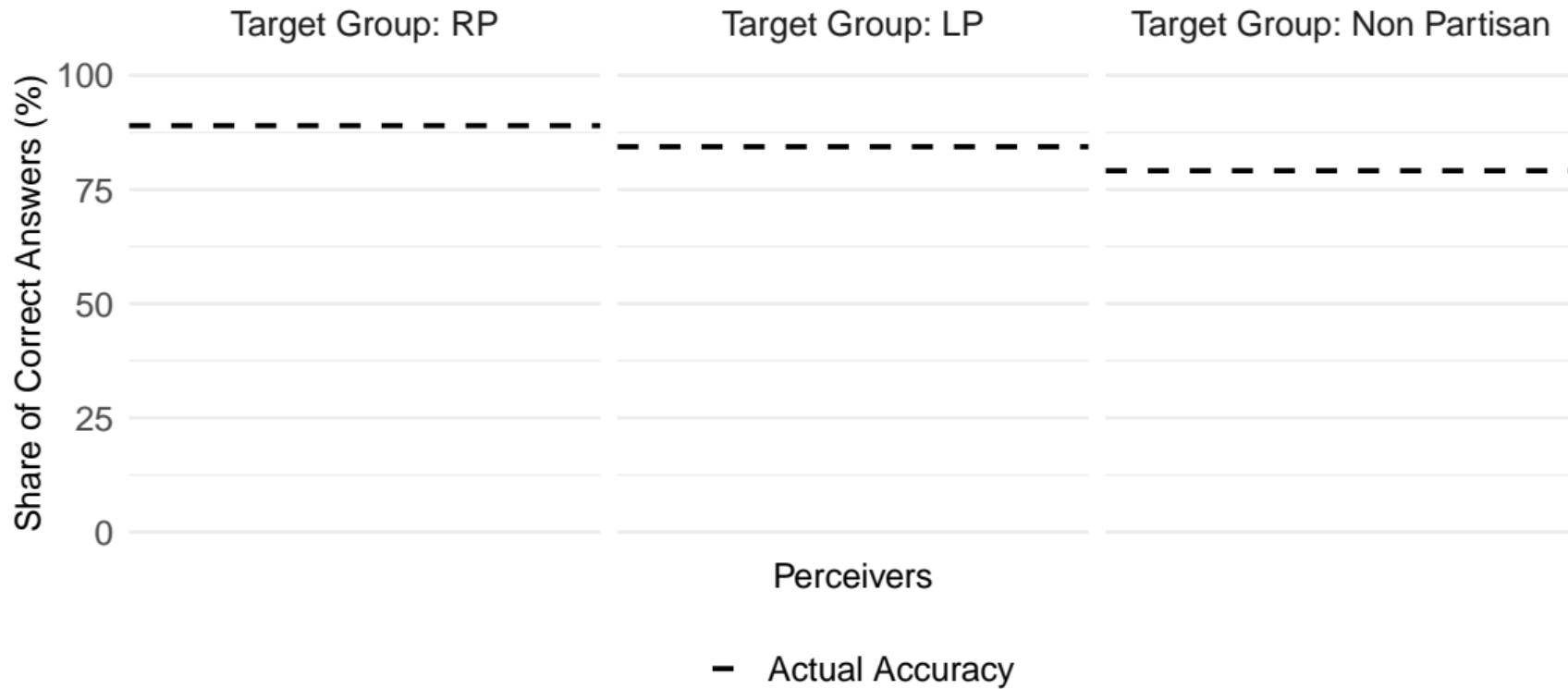
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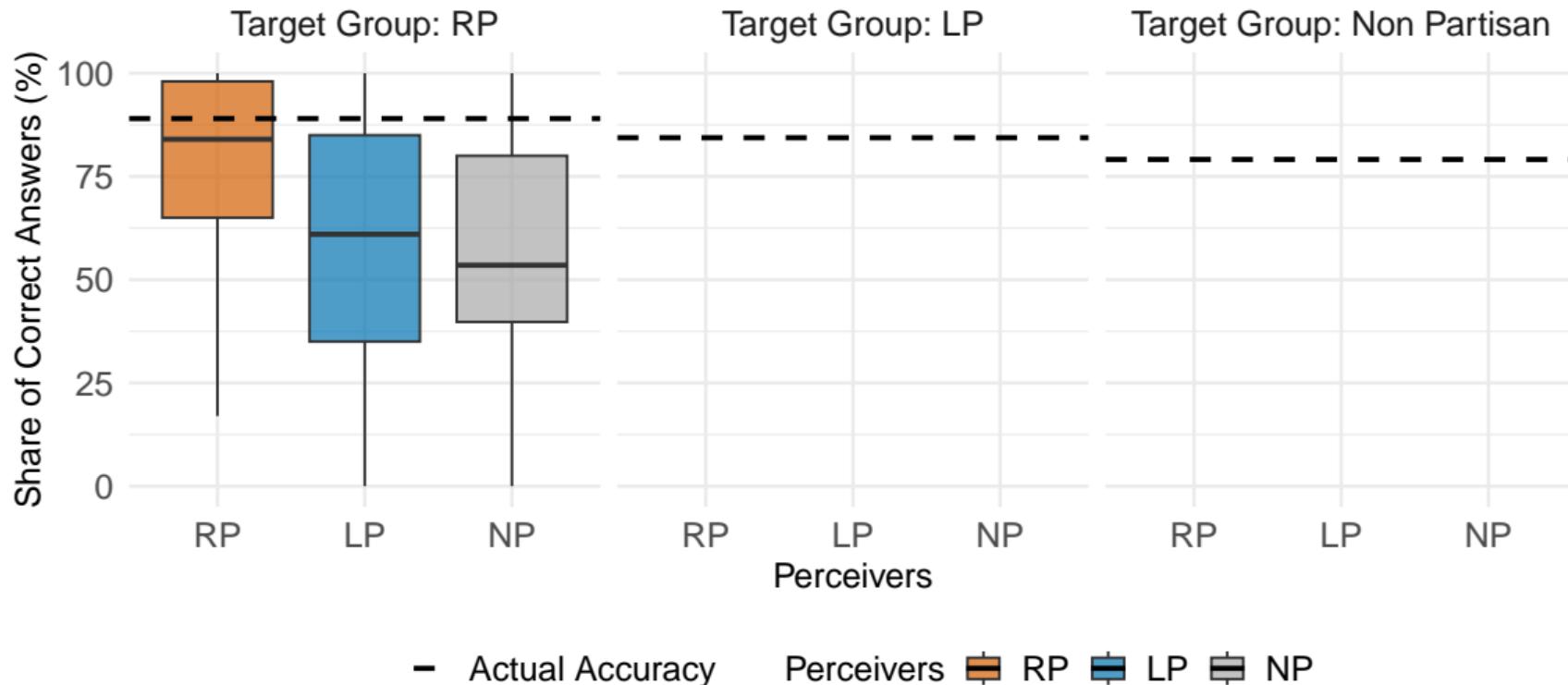
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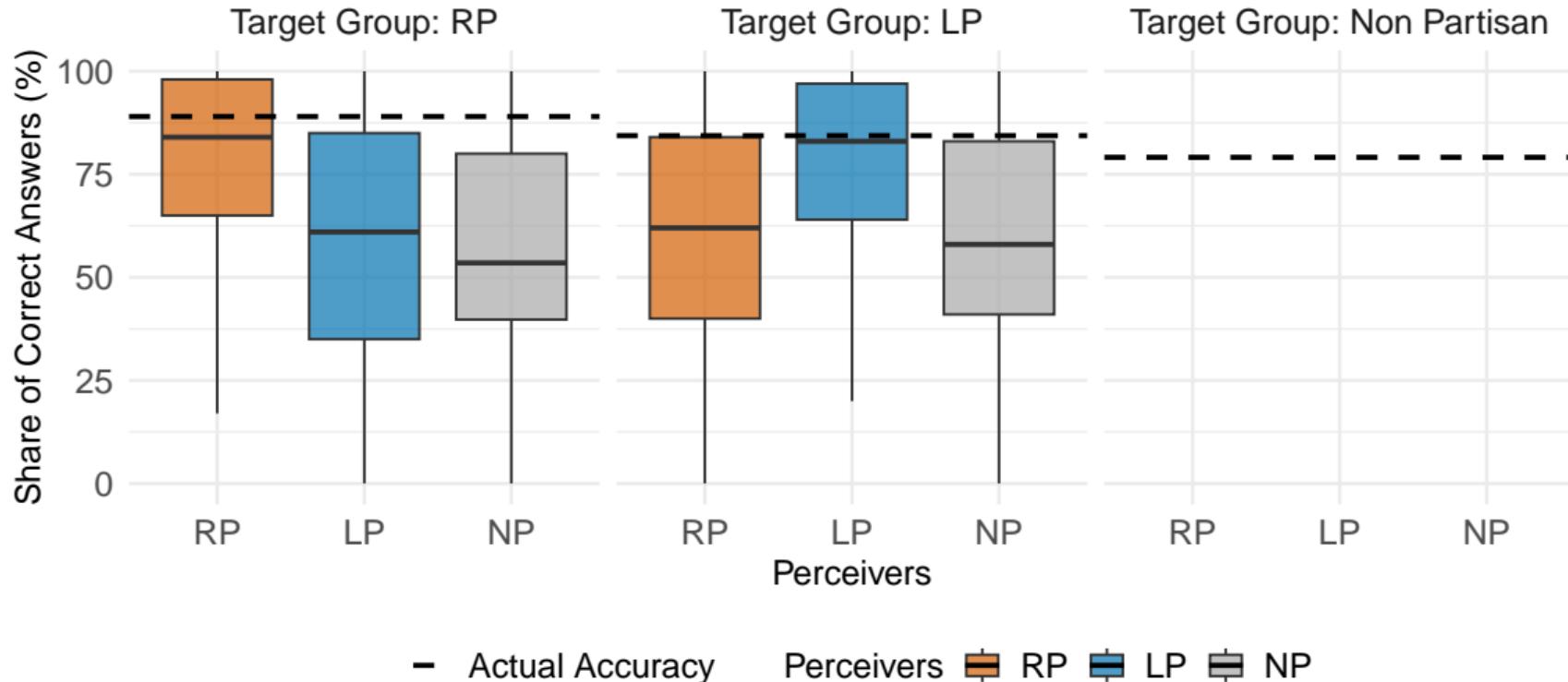
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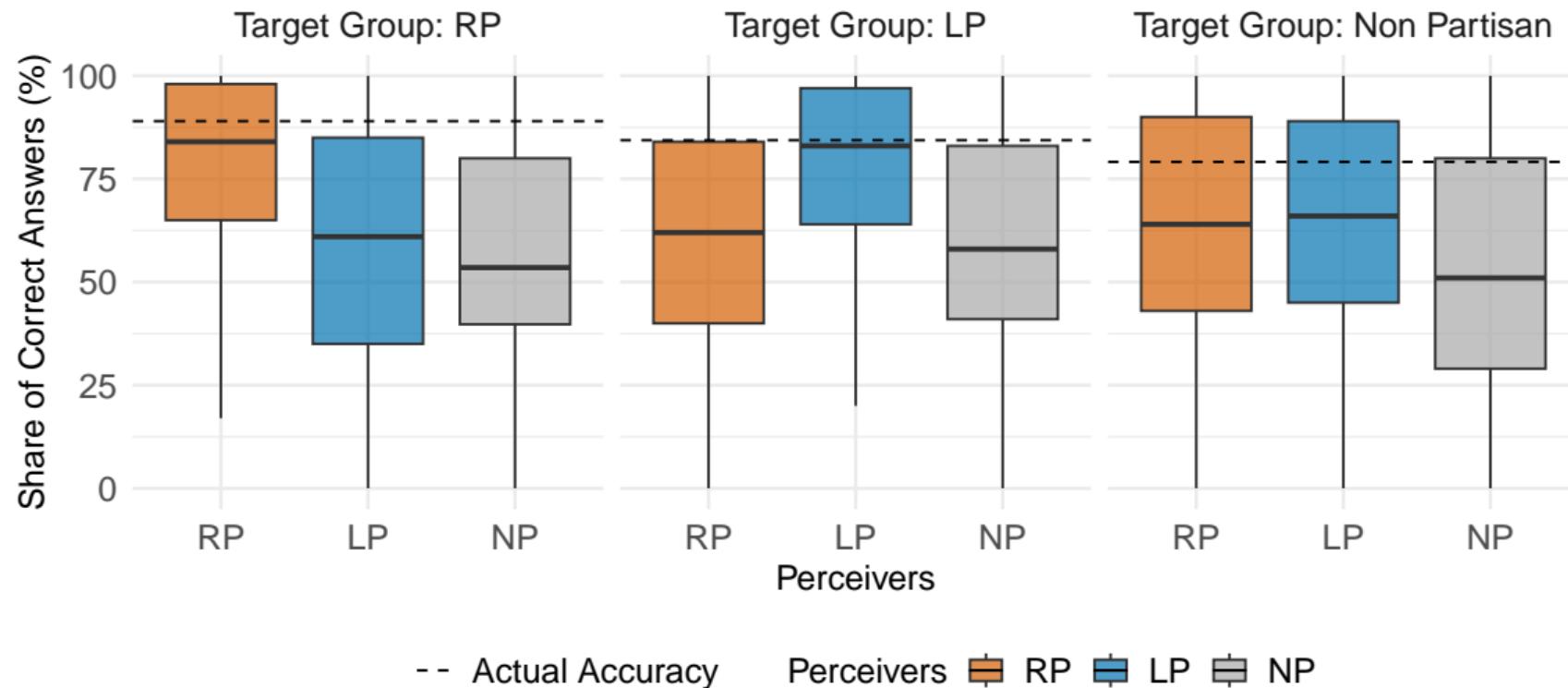
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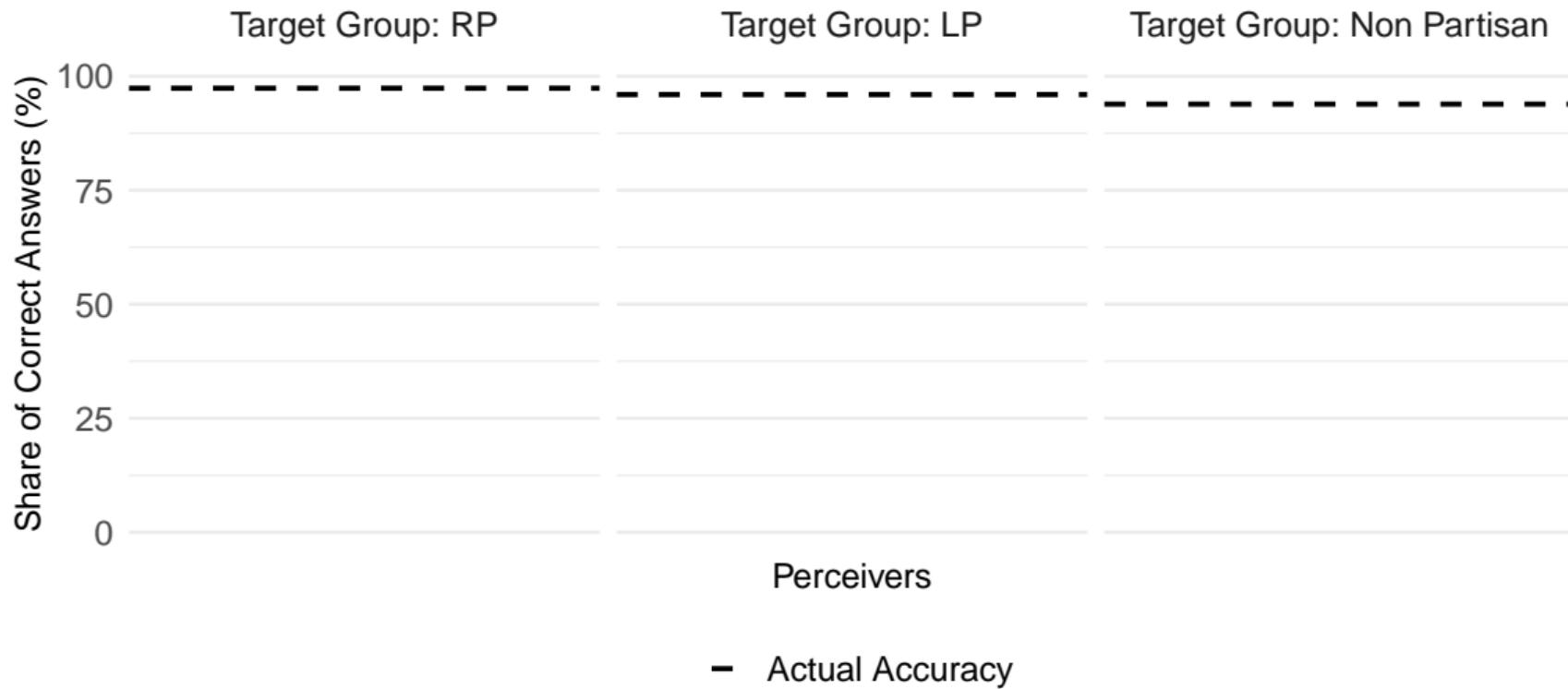
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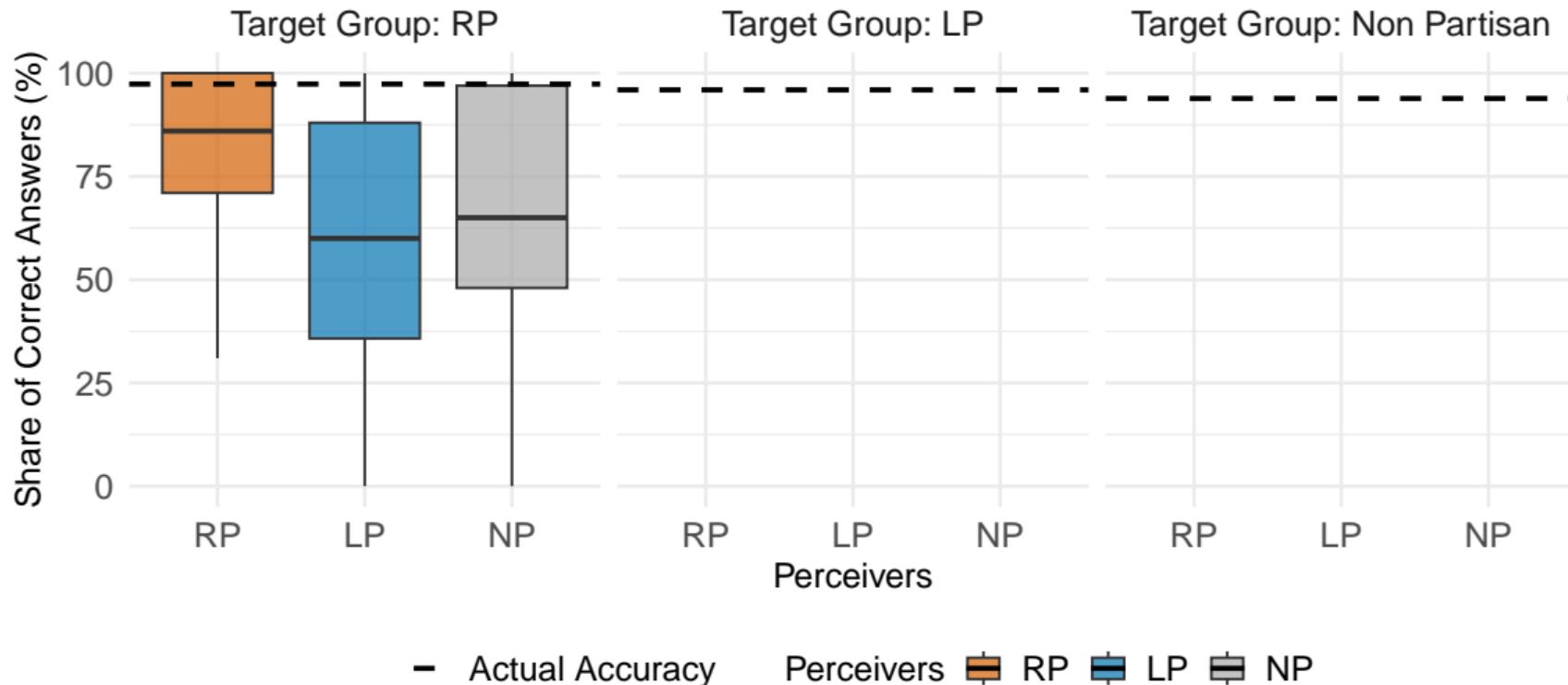
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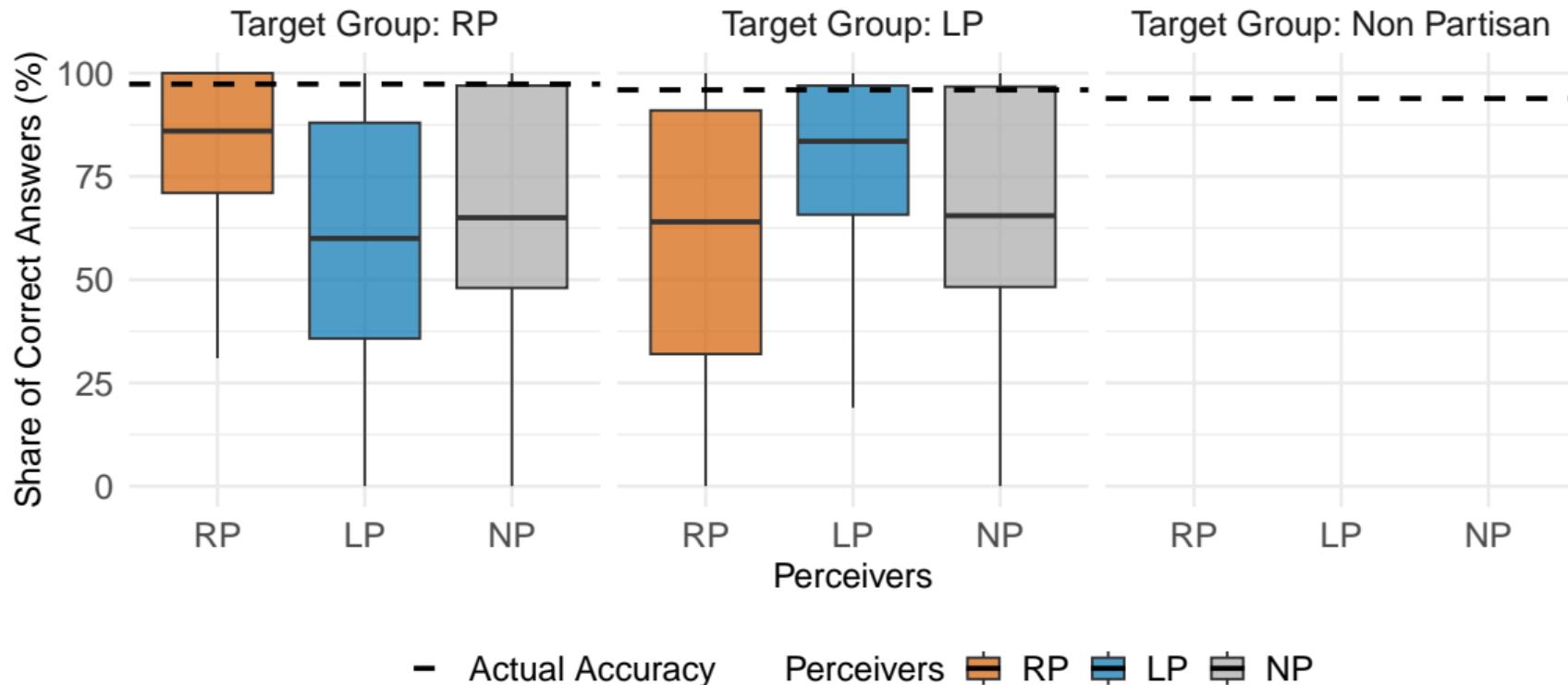
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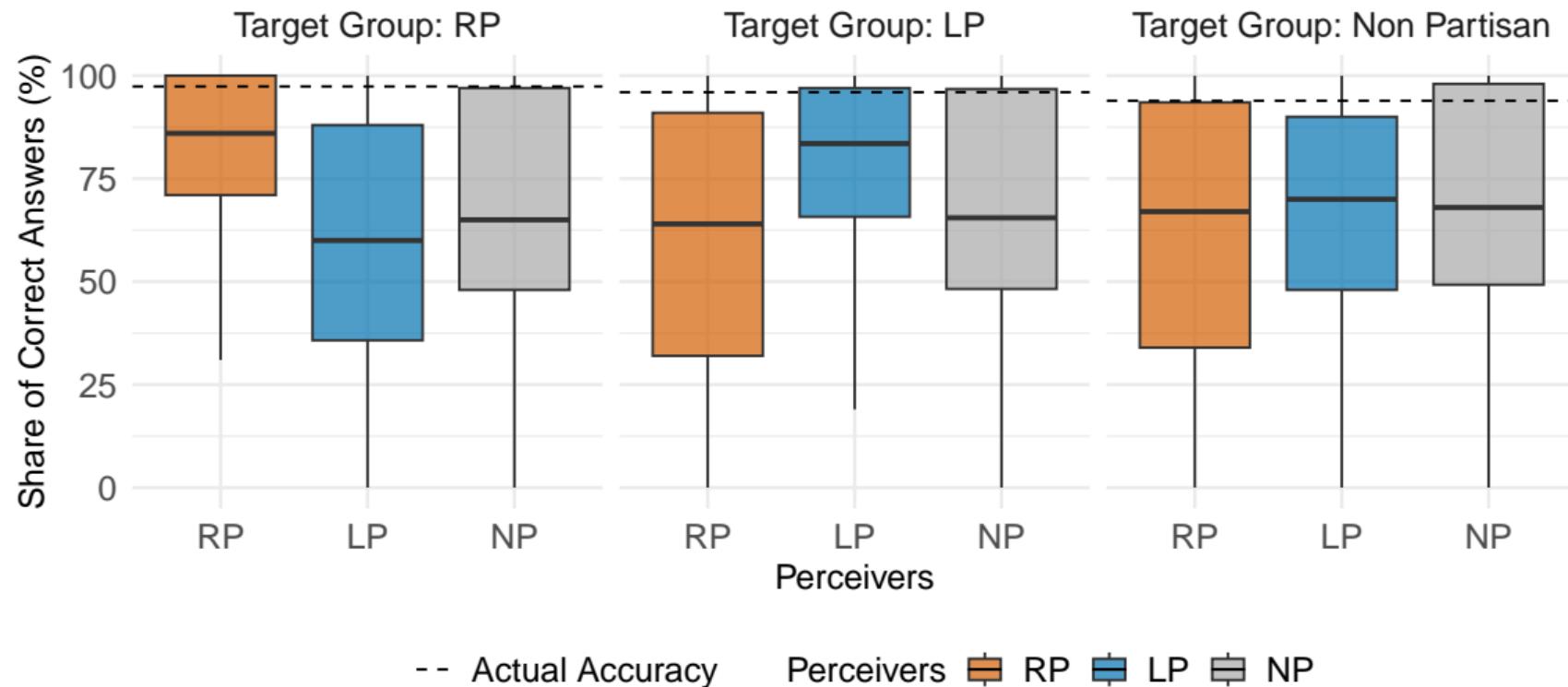
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## More Systematic Approach for Average Disbelief

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- $p_{i,j}^t$ : Accuracy rate of group  $t \in \{RP, LP\}$  in task  $j$  perceived by  $i$ ,  $g(i)$   $i$ 's group
- Target-based Partisan Disbelief (given perceiver  $i$ ,  $g(i) \in \{RP, LP\}$ )

$$p_{i,j}^t = \beta_1 \mathbb{1}_{t=g(i)} + \eta_i + \eta_j + \varepsilon_{i,j}^t$$

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- Expect  $\beta_1 > 0$

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- Expect  $\beta_1 > 0$
- Null for Non-partisan (given perceiver  $i$ ,  $g(i) = NP$ )

$$p_{i,j}^t = \beta_2 \mathbb{1}_{t=g(i)} + \eta_i + \eta_j + \varepsilon_{i,j}^t$$

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- Expect  $\beta_2 = 0$

## Average Disbelief is about 15-17 pt

Country	SK	SK	SK	US	US	US
Perceiver	RP	LP	NP	RP	LP	NP
	(1)	(2)	(3)	(4)	(5)	(6)

Target = RP

Target = LP

Observations	8232	14304	10992	13752	13512	8736
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- Note: targets are RP or LP; by fixed perceiver groups, individual + task FEs

## Average Disbelief is about 15-17 pt

Country Perceiver	SK (1)	SK (2)	SK (3)	US (4)	US (5)	US (6)
Target = RP	0.174					
		(0.012)				
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Country Perceiver	SK RP (1)	SK LP (2)	SK NP (3)	US RP (4)	US LP (5)	US NP (6)
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Target = LP		0.151 (0.007)				
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Country Perceiver	SK (1)	SK (2)	SK (3)	US (4)	US (5)	US (6)
Target = RP	0.174 (0.012)		0.005 (0.007)	0.156 (0.009)		0.008 (0.009)
Target = LP		0.151 (0.007)			0.148 (0.009)	
Observations	8232	14304	10992	13752	13512	8736

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# Correlation with Affective Polarization

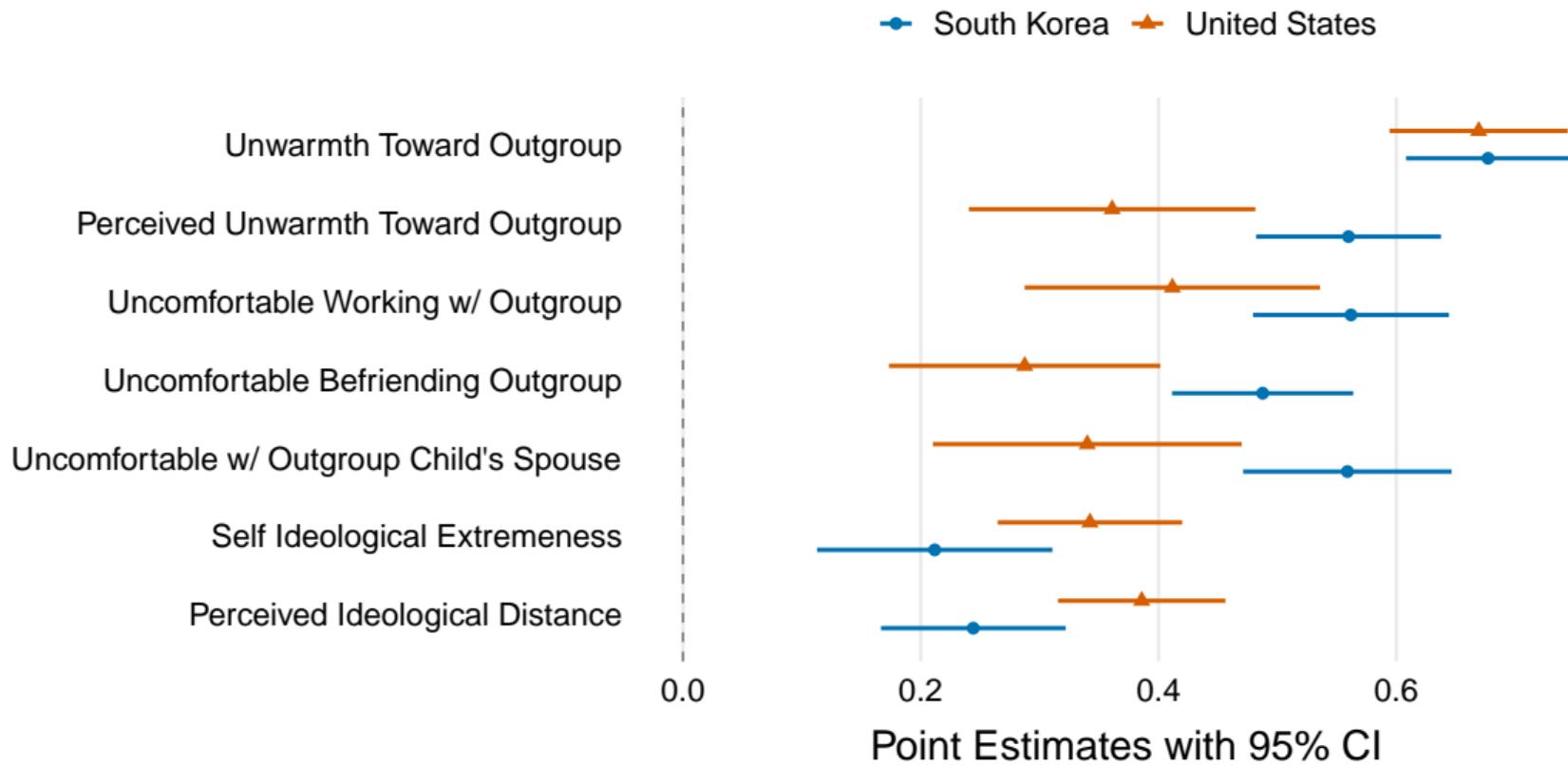
- Define “disbelief”: simple difference between estimates for in-group and out-group

$$\text{disbelief}_{i,j} \equiv p_{i,j}^{g(i)} - p_{i,j}^{g(i)'}$$

$$\text{disbelief}_i \equiv \frac{1}{8} \sum_{j=1}^8 \text{disbelief}_{i,j}$$

- Regress different polarization measures on  $\text{disbelief}_i$ 
  - Polarization measures are standardized to [0,1]

# Disbelief Correlates w/ Ideological/Affective Polarization



## Summary of Study 1

- In fact, both partisans are equally knowledgeable
- However, there are about 15 points of disbelief in out-group knowledge
- Non-partisans equally perceive knowledge of RP and LP
- Correlates with ideological and affective polarization

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- Document **in-group bias in Information Processing**
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- Document **in-group bias in Information Processing**
  - e.g., RP overweights the opinion of RP over that of LP
- Run experiments if correcting **disbelief** reduces the **in-group bias**
  - Study 1 already shows RP and LP are, in fact, equally knowledgeable
  - Treatment = telling the fact above

## Study 2: Survey Structure (N=4,200)

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  - In-group signal: tells that in-groups know the correct answers
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Note: Only keep RP/LP w/ pre-treatment disbelief > 5pt (2305 in SK, 2792 in US)

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1. Pre-signal (same as Study 1)

- Judge if it is True + give confidence (0-100)
- Estimate the accuracy rate of RP/LP

## Study 2: Signals in Post-Treatment Questions

For each question (suppose it is False),

1. Pre-signal (same as Study 1)
  - Judge if it is True + give confidence (0-100)
  - Estimate the accuracy rate of RP/LP
2. Signal (randomized, in-group or out-group)–Truth-telling signal
  - "According to previous surveys, the majority of RP says False"
  - "According to previous surveys, the majority of DP says False"

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3. Post-signal
  - Re-judge if it is True + give confidence (0-100)

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For each question (suppose it is False),

1. Pre-signal (same as Study 1)
  - Judge if it is True + give confidence (0-100)
  - Estimate the accuracy rate of RP/LP
2. Signal (randomized, in-group or out-group) – Truth-telling signal
  - "According to previous surveys, the majority of RP says False"
  - "According to previous surveys, the majority of DP says False"
3. Post-signal
  - Re-judge if it is True + give confidence (0-100)

**What we want: See how/if they update their beliefs (judgement & confidence)**

# Hypotheses:

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- H1: Treatment decreases post-treatment disbelief
- H2: Partisans have in-group bias in information processing
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- H4: Treatment decreases affective polarization

# Today's Plan

Surveys, Background

Study 1. Baseline Evidence of Disbelief

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**H1: Treatment Effects on Disbelief**

H2: Existence of In-group Bias in Information Processing

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H4: Treatment Effects on Correcting Disbelief on Polarization

Conclusion

# H1: Treatment Reduces Disbelief by 20% - 40%

- Define average out-group disbelief for post-treatment facts  $\text{disbelief}_i^{\text{post}}$
- We run

$$\text{disbelief}_i^{\text{post}} = \alpha T_i + \varepsilon_i$$

Treatment	(1) SK	(2) US
Observations	2305	2792
Mean of outcome	0.232	0.195

# H1: Treatment Reduces Disbelief by 20% - 40%

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$$\text{disbelief}_i^{\text{post}} = \alpha T_i + \varepsilon_i$$

	(1)	(2)
	SK	US
Treatment	-0.050 (0.010)	-0.076 (0.009)
Observations	2305	2792
Mean of outcome	0.232	0.195

# Today's Plan

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Conclusion

# Measurement of In-group Bias in Information Processing

For individual  $i$  and task  $j$ , construct two types of dummy variables

1. Correct Judgement:  $y_{i,j}^J \equiv \mathbb{1}\{ J_{i,j}^1 - J_{i,j}^0 > 0 \};$

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- $J_{i,j}^0$ : Correctness before signals ( $J_{i,j}^0 = 1$  if Correct and = 0 if Wrong)
- $J_{i,j}^1$ : Correctness after signals

# Measurement of In-group Bias in Information Processing

For individual  $i$  and task  $j$ , construct two types of dummy variables

1. Correct Judgement:  $y_{i,j}^J \equiv \mathbb{1}\{ J_{i,j}^1 - J_{i,j}^0 > 0 \}$ ;

2. Confidence towards Correct Answer:  $y_{i,j}^\mu \equiv \mathbb{1}\{ \mu_{i,j}^1 - \mu_{i,j}^0 > 0 \}$ ;

-  $\mu_{i,j}^0$ : Confidence towards Correct answers before signals

$$\mu_{i,j}^0 = \begin{cases} \frac{a_{i,j}^0}{100} & \text{if } J_{i,j}^0 = 1 \\ 1 - \frac{a_{i,j}^0}{100} & \text{if } J_{i,j}^0 = 0 \end{cases}$$

where  $a_{i,j}^0 \in [0, 100]$  is confidence level for their answer

-  $\mu_{i,j}^1$ : Confidence towards Correct answers after signals

## H2: In-group Signals Shift Beliefs More Toward the Truth?

Specification: (i: indiv., j: task)

$$y_{i,j} = \beta \mathbb{1}\{\text{In-group Signal}\}_{i,j} + \eta_j + \varepsilon_{i,j}$$

- $y_{i,j}$ : measure of Information Processing,  $y_{i,j}^J$  or  $y_{i,j}^\mu$
- $\mathbb{1}\{\text{In-group Signal}\}_{i,j}$ : dummy if in-group signal
  - e.g.) If R, "The majority of R says this is True..." is an in-group signal
- Expect  $\beta > 0$

## H2: In-group Signals Shift Beliefs More Toward the Truth

$$y_{i,j} = \beta \mathbb{1}\{\text{In-group Signal}\}_{i,j} + \eta_j + \varepsilon_{i,j}$$

	(1)	(2)	(3)	(4)
	SK	SK	US	US
	Dummy	Continuous	Dummy	Continuous
In-Group Signal				
Observations	3417	3417	4221	4221
Mean of outcome	0.102	0.424	0.170	0.481

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	SK	SK	US	US
	Dummy	Continuous	Dummy	Continuous
In-Group Signal	0.058 (0.010)			
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	(1) SK Dummy	(2) SK Continuous	(3) US Dummy	(4) US Continuous
In-Group Signal	0.058 (0.010)	0.078 (0.008)	0.007 (0.009)	0.041 (0.012)
Observations	3417	3417	4221	4221
Mean of outcome	0.102	0.424	0.170	0.481

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Conclusion

### H3: Treatment of Correcting Disbelief

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  - e.g.) "You think that R are more knowledgeable than D. This is wrong."

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- Keep only those who have disbelief (>5pt) on Out-group Knowledge (64%)
- **Treatment (after pre-treatment task)**
  - e.g.) "You think that R are more knowledgeable than D. This is wrong."
- See if Treatment reduces in-group bias in Information Processing

### H3: Treatment, In-group Bias in Information Processing

Specification ( $s_{i,j} = I$ : In-group signal)

$$y_{i,j} = \beta_1 \mathbb{1}\{s_{i,j} = I\} + \beta_2 T_i + \beta_3 (\mathbb{1}\{s_{i,j} = I\} \times T_i) + \eta_j + \varepsilon_{i,j}$$

- Expect  $\beta_3 < 0$  (given that  $\beta_1 > 0$ )

### H3: Treatment, In-group Bias in Information Processing

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	(1) SK Dummy	(2) SK Continuous	(3) US Dummy	(4) US Continuous
In-Group Signal				
Treatment				
In-Group Signal x Treatment				
Observations	6915	6915	8376	8376
Mean of outcome	0.103	0.421	0.165	0.484

### H3: Treatment, In-group Bias in Information Processing

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	(1) SK Dummy	(2) SK Continuous	(3) US Dummy	(4) US Continuous
In-Group Signal	0.058 (0.010)			
Treatment	0.016 (0.009)			
In-Group Signal x Treatment	-0.031 (0.002)			
Observations	6915	6915	8376	8376
Mean of outcome	0.103	0.421	0.165	0.484

### H3: Treatment, In-group Bias in Information Processing

$$y_{i,j} = \beta_1 \mathbb{1}\{s_{i,j} = I\} + \beta_2 T_i + \beta_3 (\mathbb{1}\{s_{i,j} = I\} \times T_i) + \eta_j + \varepsilon_{i,j}$$

	(1)	(2)	(3)	(4)
	SK Dummy	SK Continuous	US Dummy	US Continuous
In-Group Signal	0.058 (0.010)	0.078 (0.009)		
Treatment	0.016 (0.009)	0.023 (0.019)		
In-Group Signal x Treatment	-0.031 (0.002)	-0.060 (0.028)		
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Mean of outcome	0.103	0.421	0.165	0.484

### H3: Treatment, In-group Bias in Information Processing

$$y_{i,j} = \beta_1 \mathbb{1}\{s_{i,j} = I\} + \beta_2 T_i + \beta_3 (\mathbb{1}\{s_{i,j} = I\} \times T_i) + \eta_j + \varepsilon_{i,j}$$

	(1)	(2)	(3)	(4)
	SK Dummy	SK Continuous	US Dummy	US Continuous
In-Group Signal	0.058 (0.010)	0.078 (0.009)	0.007 (0.010)	0.041 (0.012)
Treatment	0.016 (0.009)	0.023 (0.019)	-0.018 (0.008)	0.023 (0.019)
In-Group Signal x Treatment	<b>-0.031</b> (0.002)	<b>-0.060</b> (0.028)	<b>0.018</b> (0.007)	<b>-0.036</b> (0.015)
Observations	6915	6915	8376	8376
Mean of outcome	0.103	0.421	0.165	0.484

# Today's Plan

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Conclusion

## H4: Effects on Correcting Disbelief on Polarization

Specification (LHS: Combined measures of affective polarization)

$$\text{pol}_i = \gamma T_i + \varepsilon_i$$

## H4: Effects on Correcting Disbelief on Polarization

Specification (LHS: Combined measures of affective polarization)

$$\text{pol}_i = \gamma T_i + \varepsilon_i$$

	(1) SK Unfav	(2) SK Uncomf	(3) US Unfav	(4) US Uncomf
Treatment	-0.025 (0.012)	-0.002 (0.012)	-0.081 (0.013)	-0.023 (0.016)
Observations	2305	2305	2792	2792
Mean of outcome	0.528	0.433	0.493	0.271

# Today's Plan

## Surveys, Background

### Study 1. Baseline Evidence of Disbelief

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### Study 2. Correcting Disbelief

Survey Design and Hypotheses

H1: Treatment Effects on Disbelief

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H3: Treatment Effects of Correcting Disbelief on In-group Bias

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## Conclusion

# Conclusion

- **Widespread disbelief about out-group knowledge** for factual questions
- **In-group bias in Information Processing**
- Correcting the disbelief can reduce the in-group bias

# Today's Plan

Summary Statistics

Further Results  
Balanced Test

Appendix: Disbelief on All Facts

# Study 1: Summary Statistics

	SK RP	SK LP	SK NP	US RP	US LP	US NP
<b>Demographics</b>						
Female Ratio	0.41	0.49	0.60	0.48	0.60	0.55
College-educated Ratio	0.83	0.77	0.76	0.51	0.54	0.37
Age (50+) Ratio	0.54	0.42	0.36	0.53	0.48	0.38
<b>Judgements</b>						
Average Accuracy Rate	0.74	0.74	0.73	0.66	0.62	0.57
Average Confidence	0.81	0.78	0.71	0.73	0.71	0.65
Observations	343	596	458	573	563	364

## Study 2: Summary Statistics

	SK Treated	SK Control	SK Diff	US Treated	US Control	US Diff
RP Supporters Ratio	0.256	0.250	0.006 (0.018)	0.543	0.519	0.024 (0.019)
Female Ratio	0.481	0.482	-0.001 (0.021)	0.488	0.532	-0.044 (0.019)
College-educated Ratio	0.804	0.795	0.010 (0.017)	0.541	0.528	0.013 (0.019)
Age (50+) Ratio	0.709	0.711	-0.002 (0.019)	0.669	0.695	-0.026 (0.018)
Pre Accuracy Rate	0.955	0.958	-0.003 (0.006)	0.848	0.834	0.014 (0.009)
Pre Disbelief	0.350	0.343	0.008 (0.011)	0.341	0.336	0.005 (0.010)
Observations	1166	1139		1385	1407	

# Today's Plan

Summary Statistics

Further Results  
Balanced Test

Appendix: Disbelief on All Facts

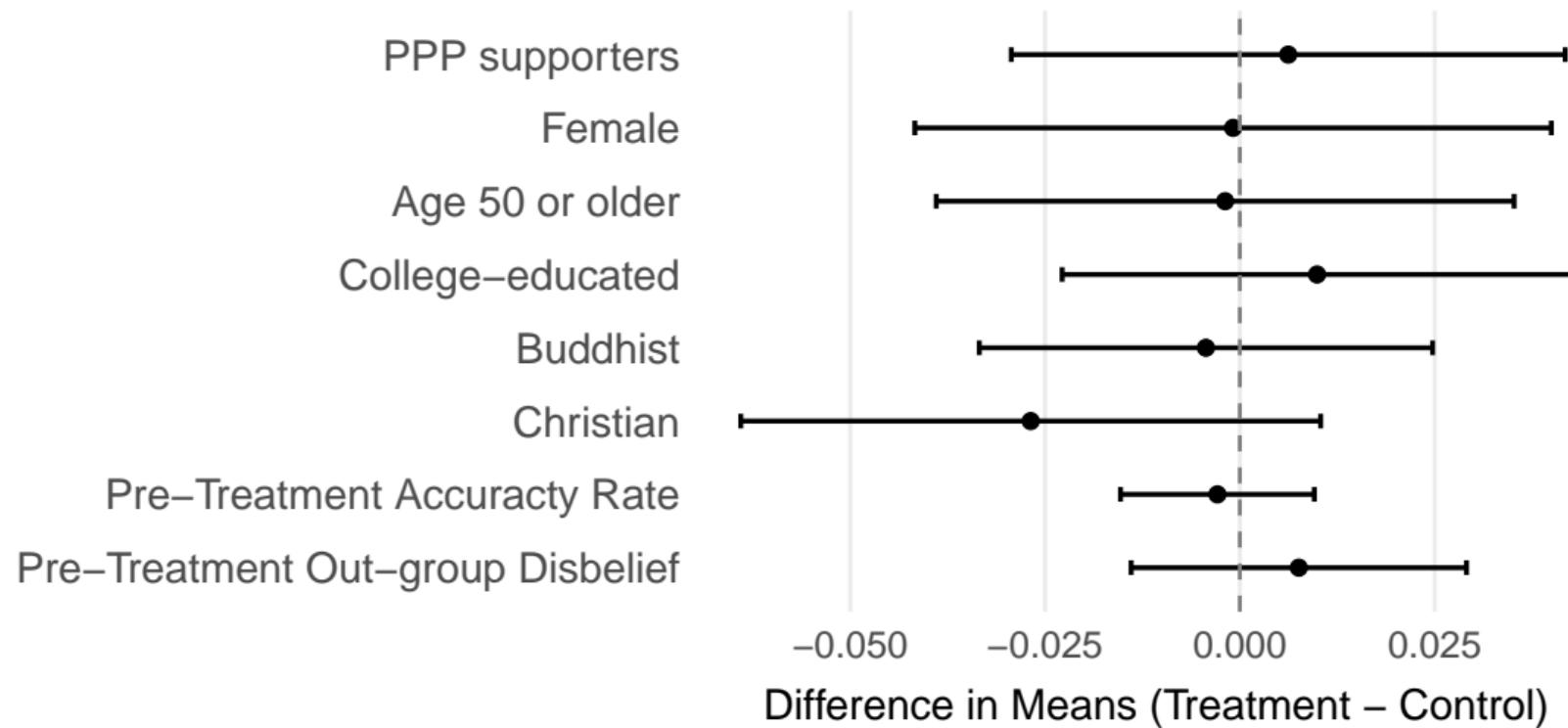
# Today's Plan

Summary Statistics

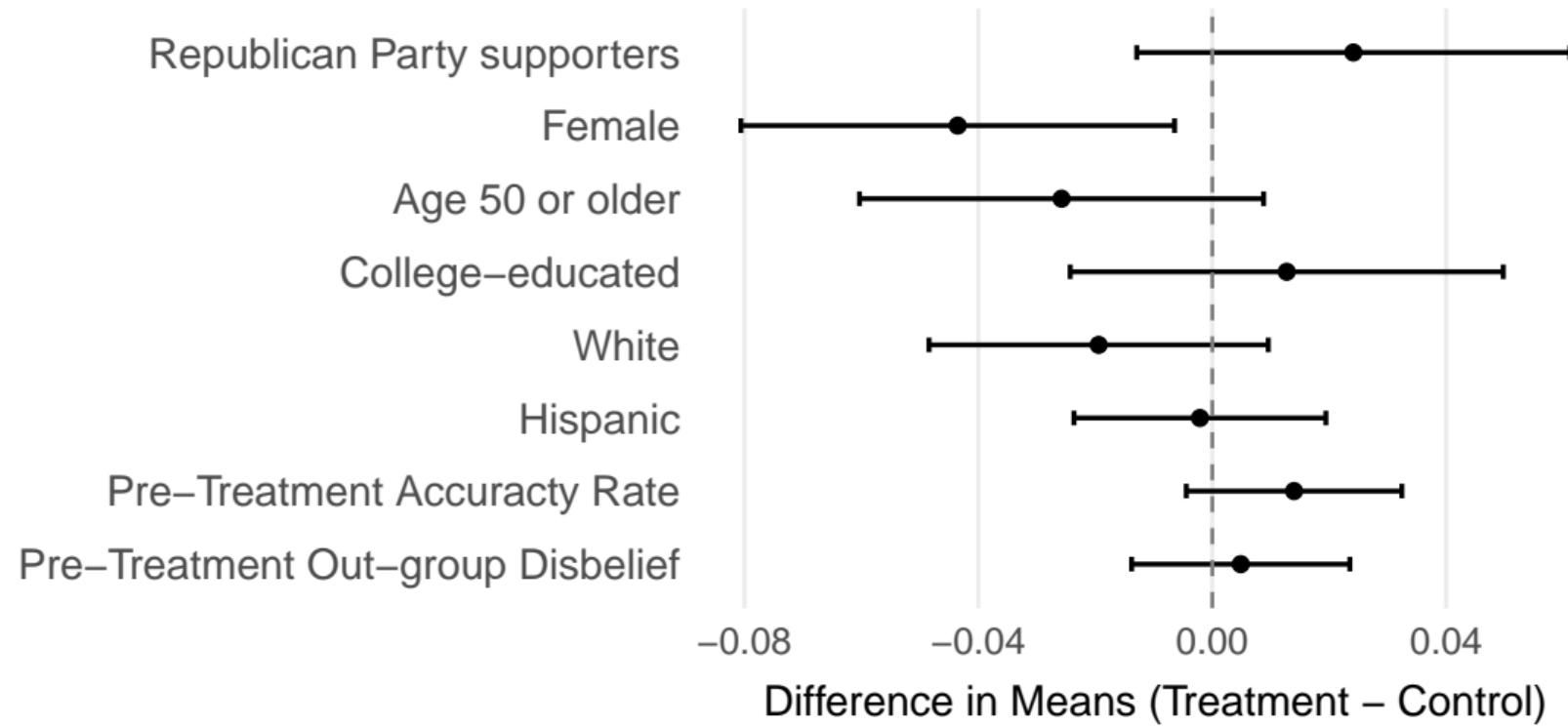
Further Results  
Balanced Test

Appendix: Disbelief on All Facts

### H3: Balanced Test across Control and Treated



### H3: Balanced Test across Control and Treated



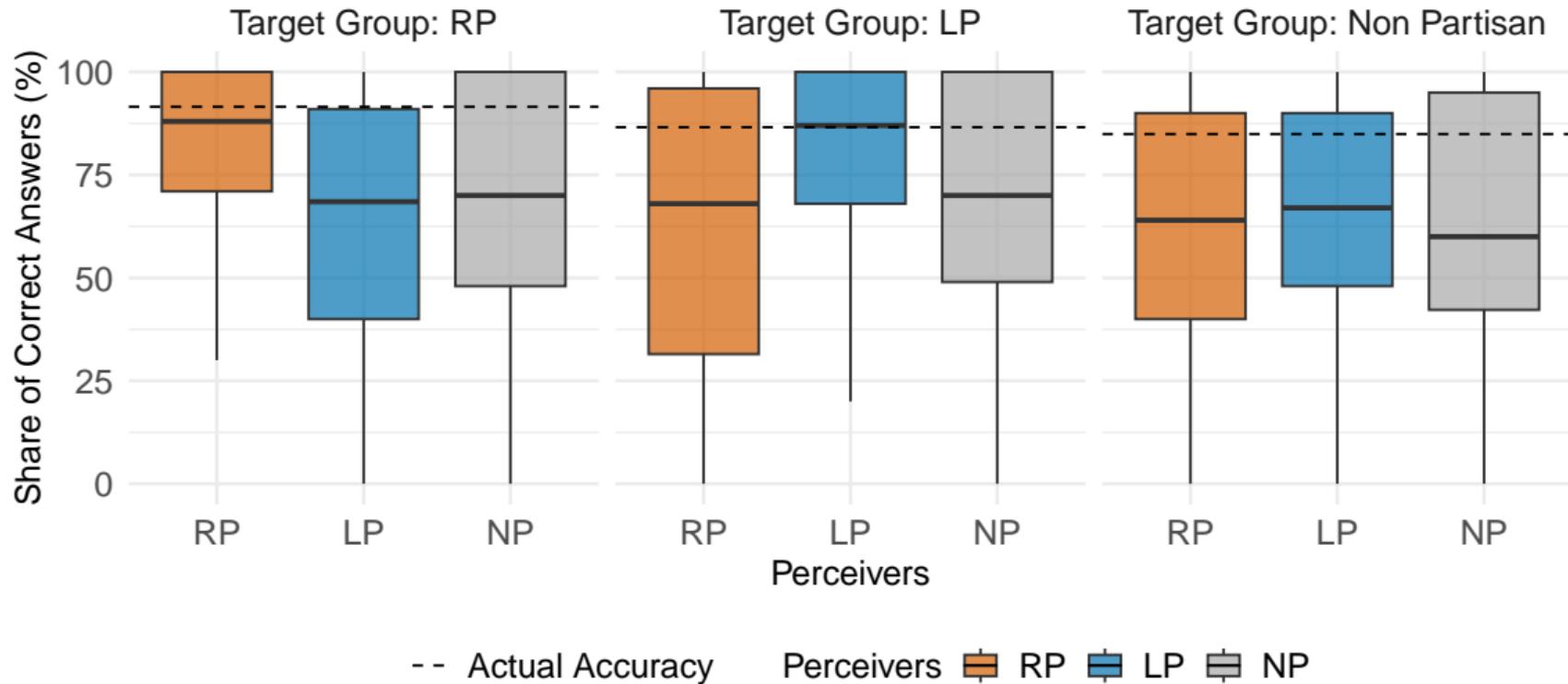
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Summary Statistics

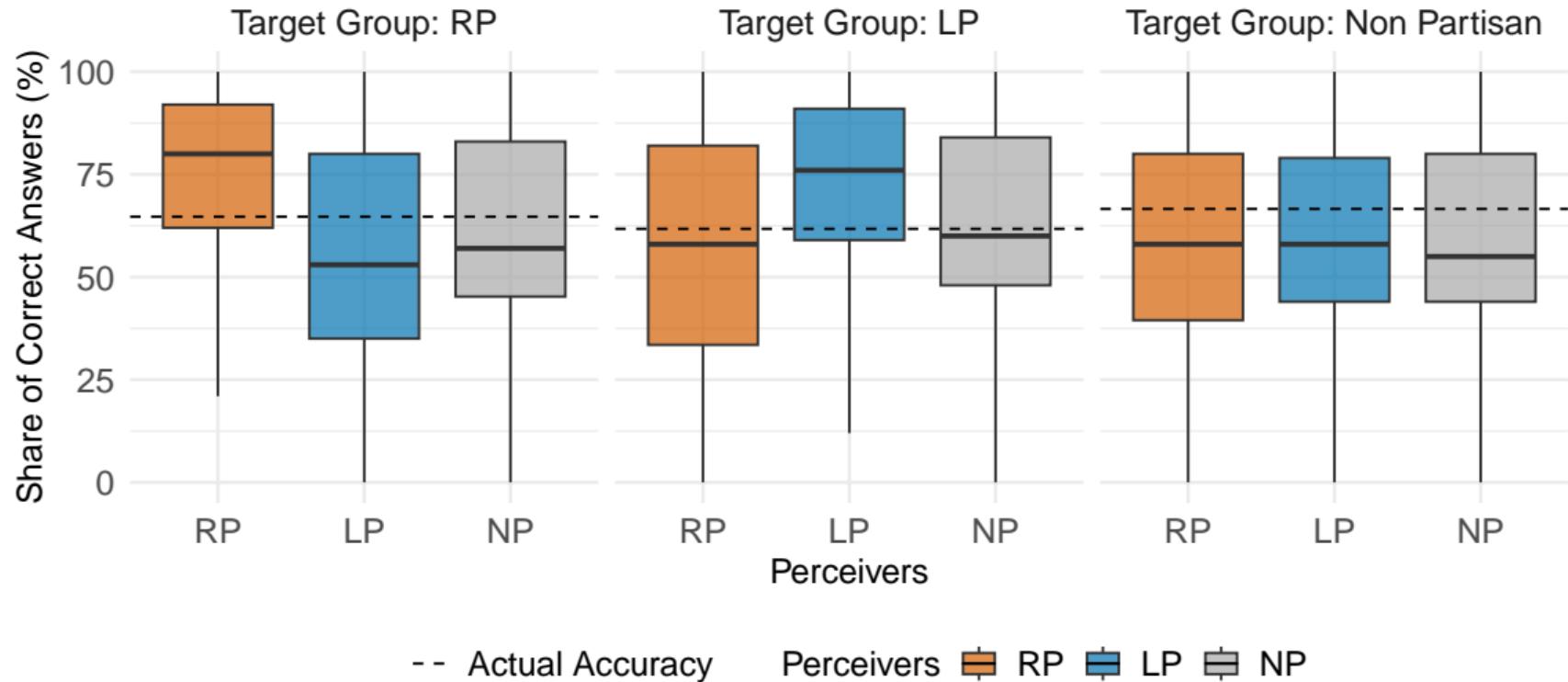
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Appendix: Disbelief on All Facts

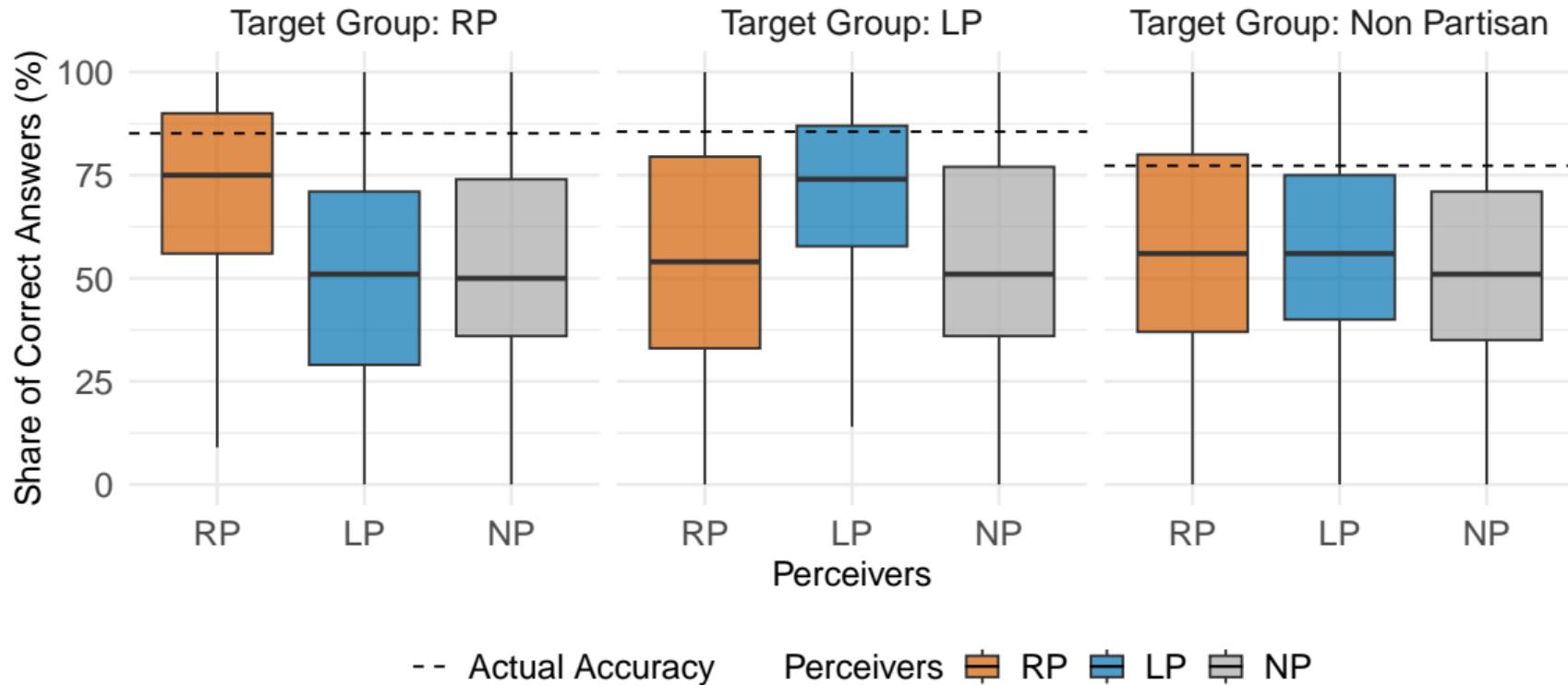
## Fact 1 : The term of office of the National Assembly is 2 years.



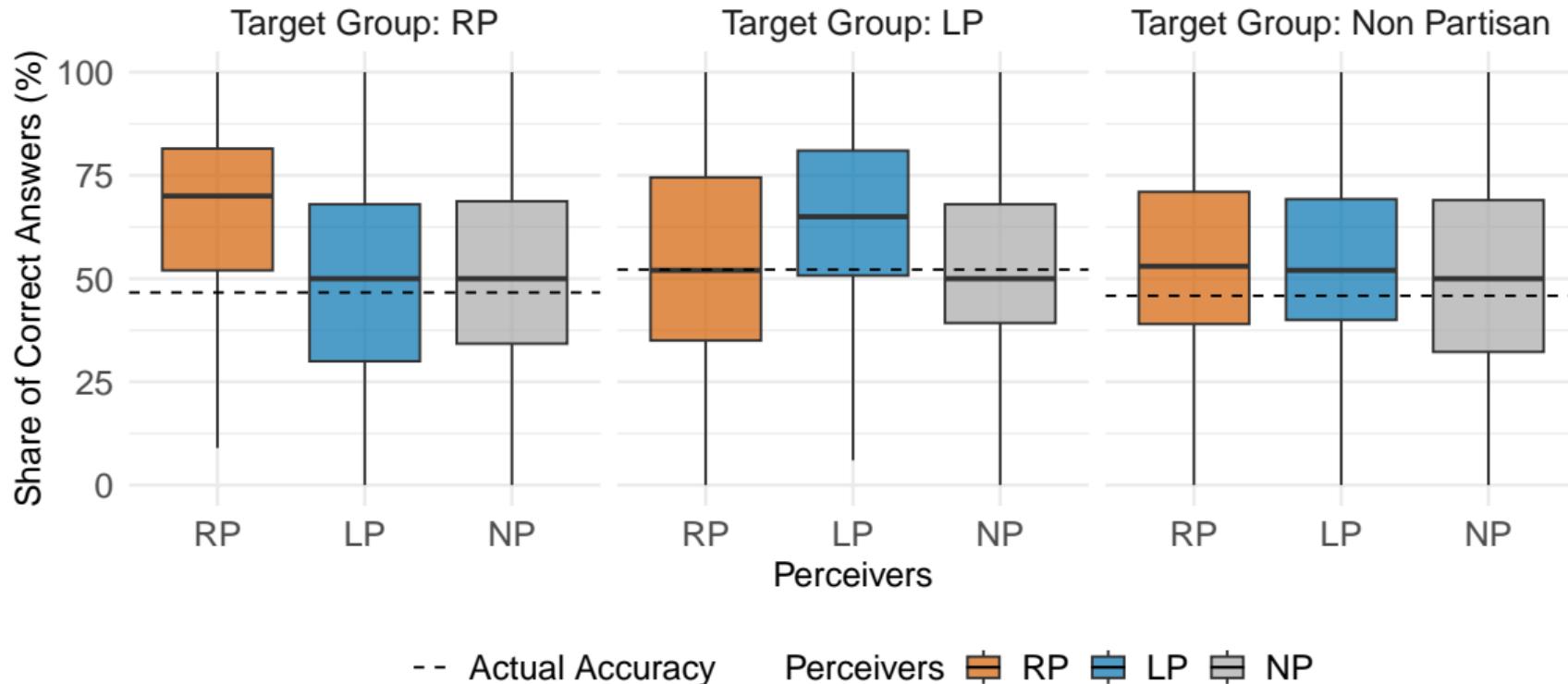
**Fact 2 : To revise the constitution, more than half of pro-votes are required in a referendum**



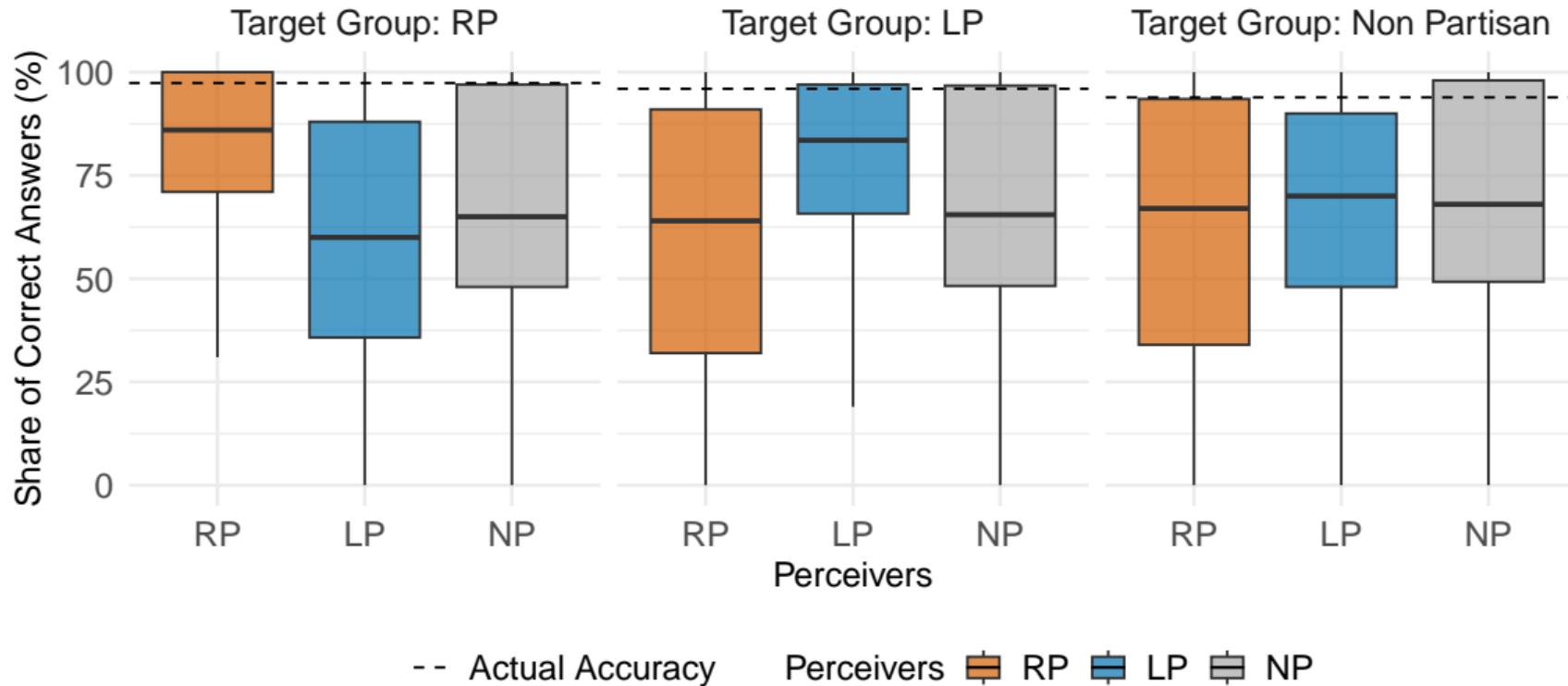
**Fact 3 : The country's nominal GDP growth rate in the previous year was lower than 5%.**



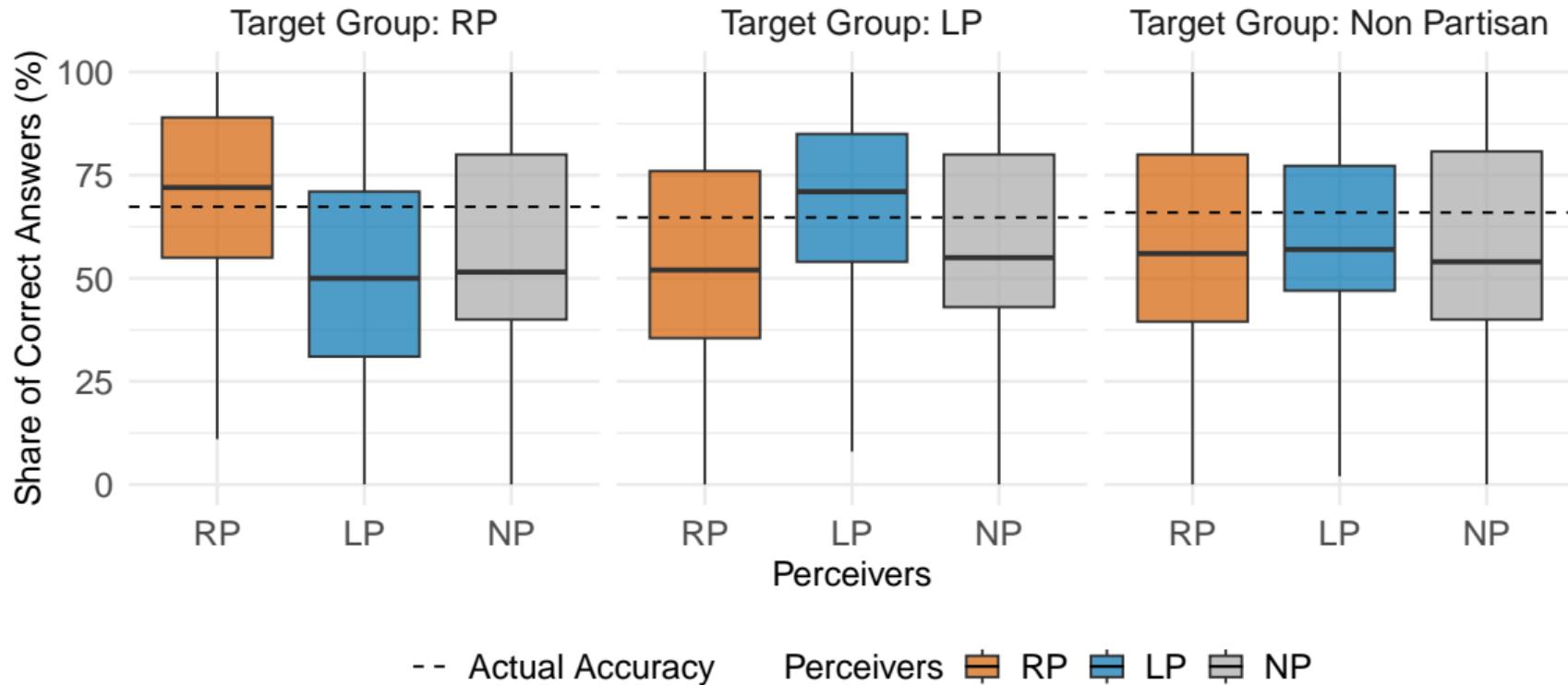
#### Fact 4 : For every hundred working-age people, there are forty old-age people who is 65



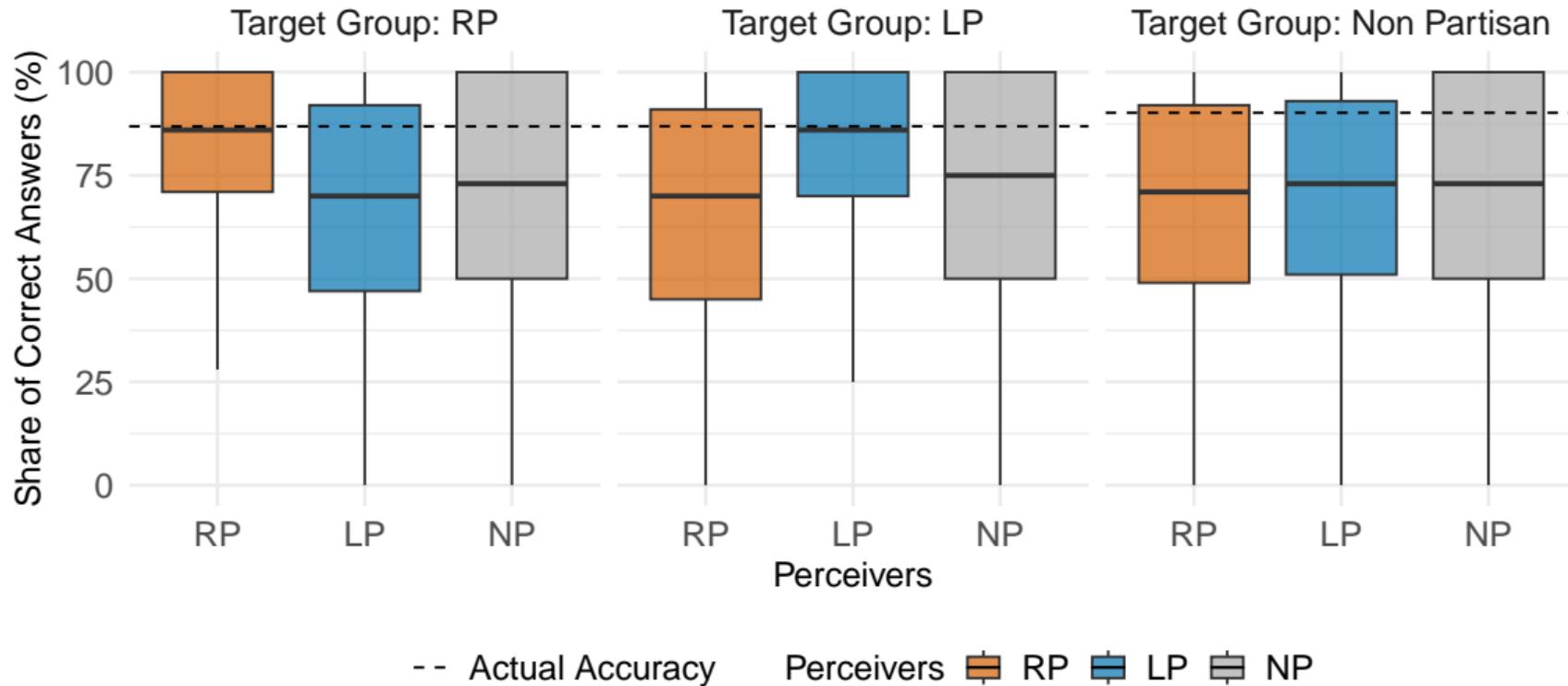
## Fact 5 : New Zealand is a country located in the Middle East.



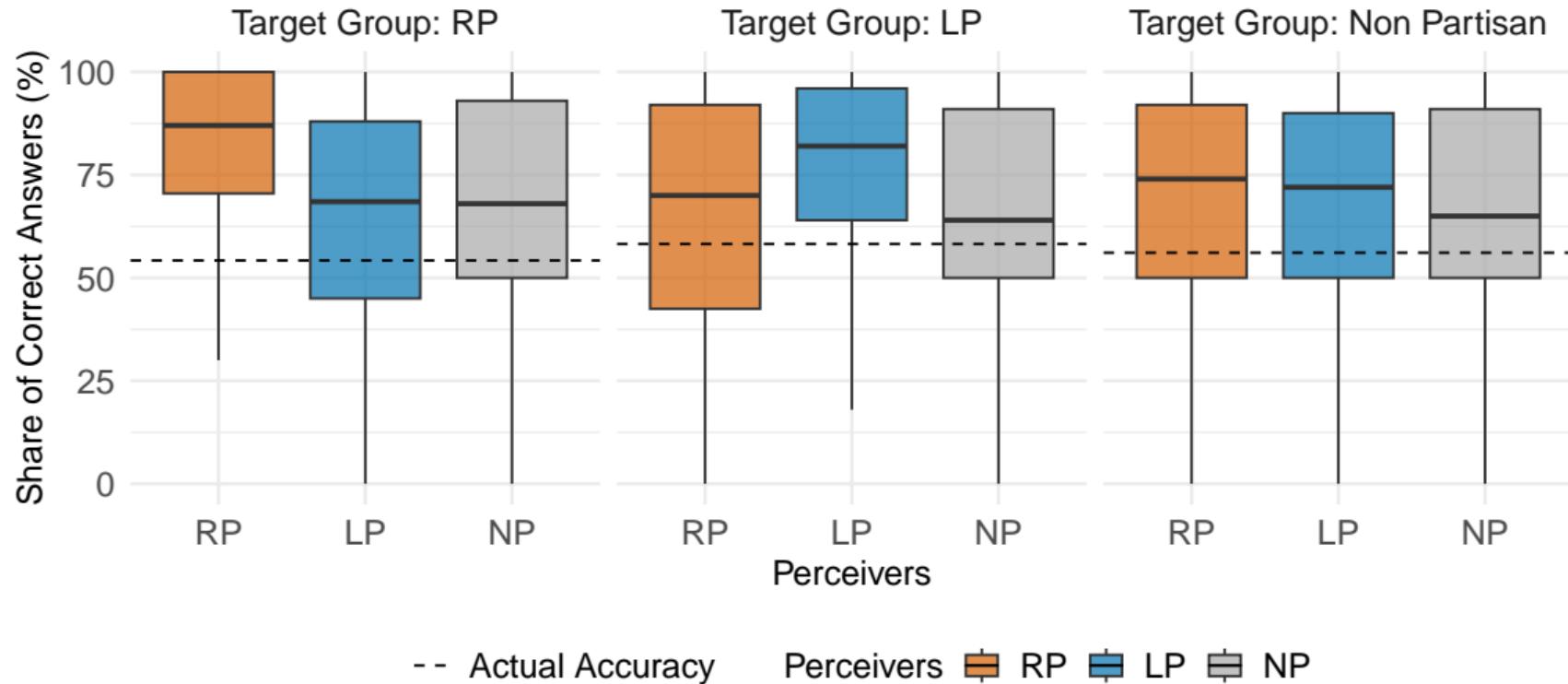
## Fact 6 : iPhone was invented before 2000.



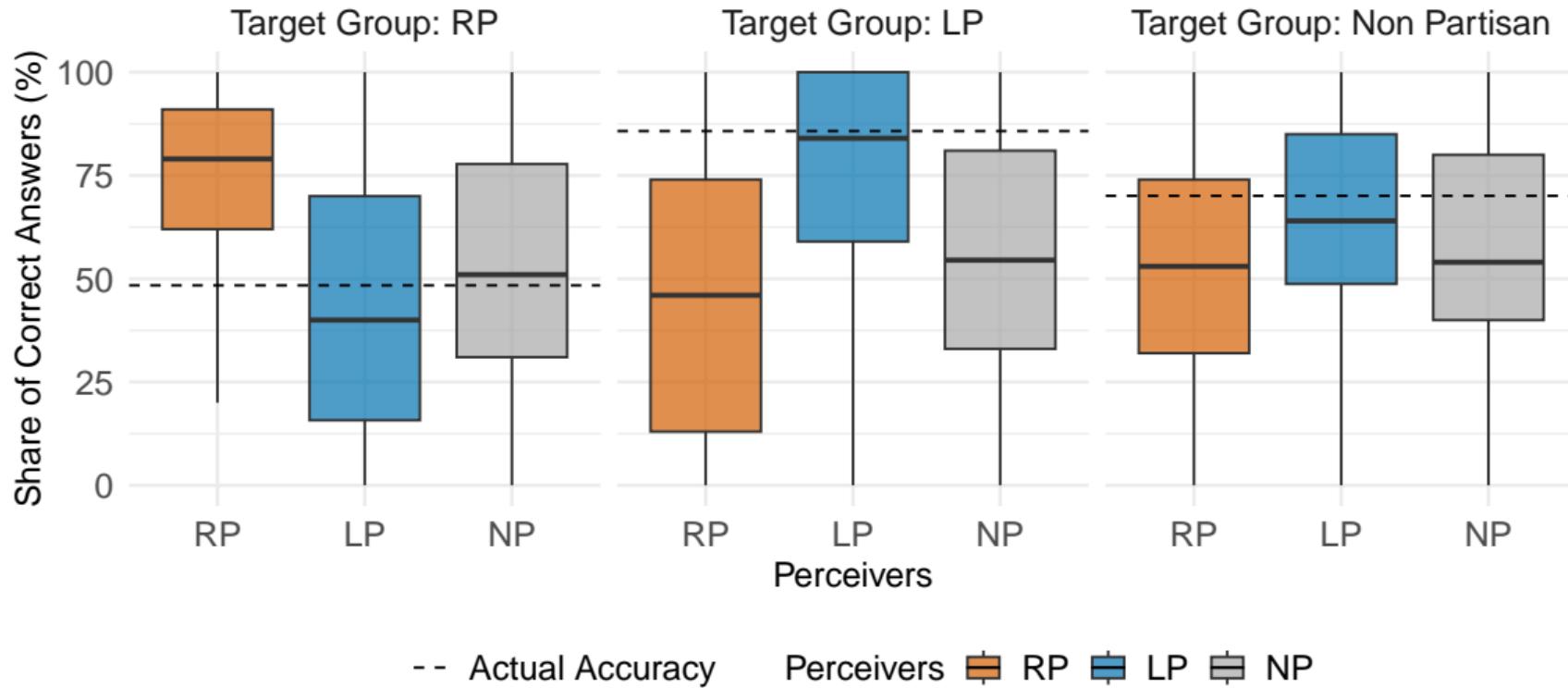
**Fact 7 : It is stipulated by law that one must be at least 19 years old to drink alcohol.**



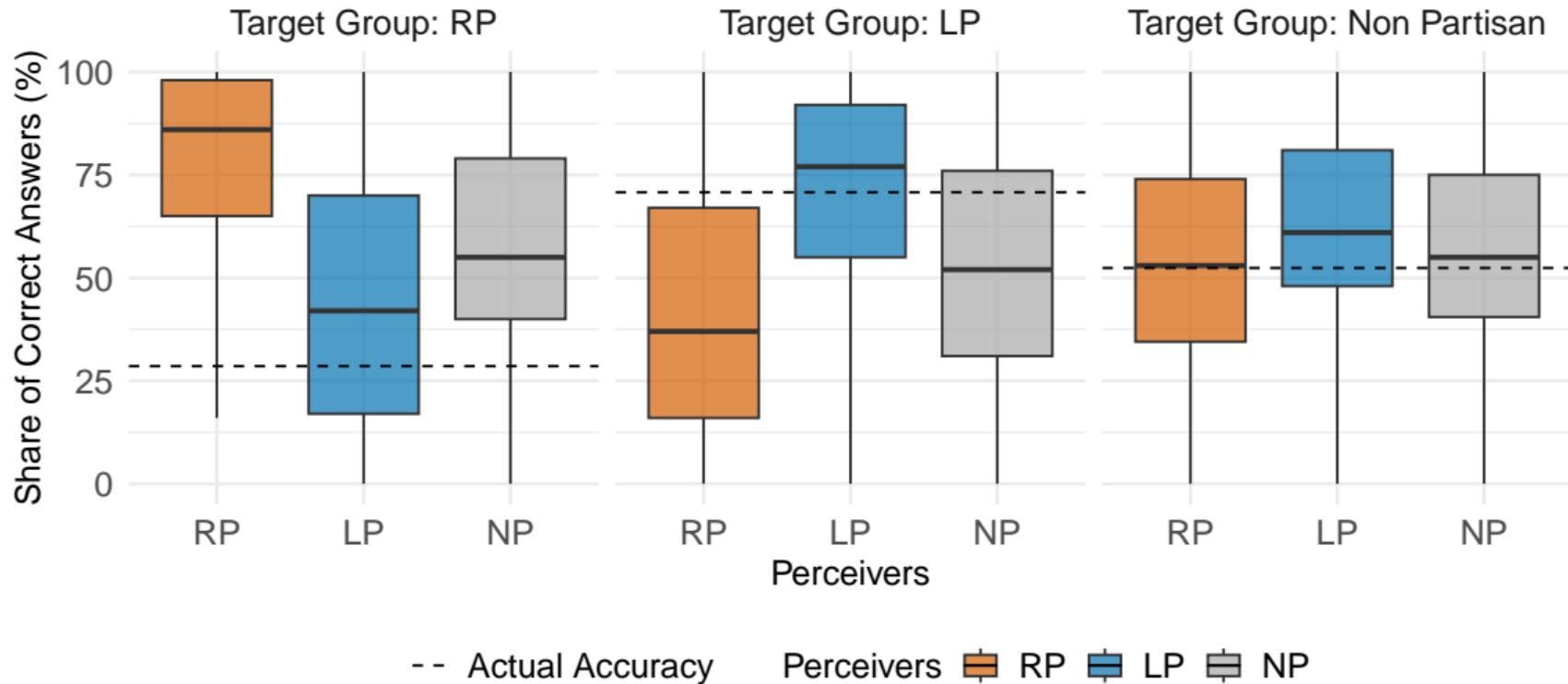
## Fact 8 : The highest mountain in the country is Hallasan Mountain.



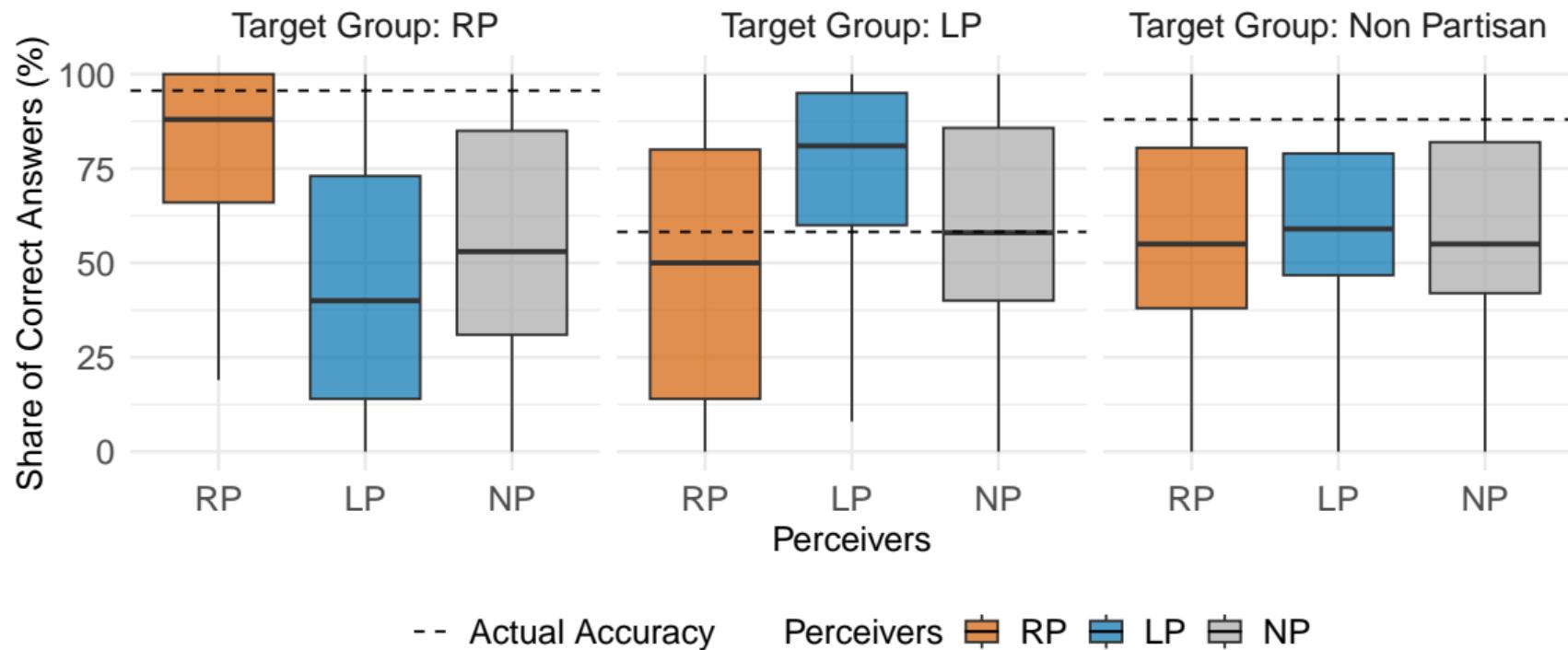
## Fact 9 : There were widespread election fraud in the 2020 and 2024 elections.



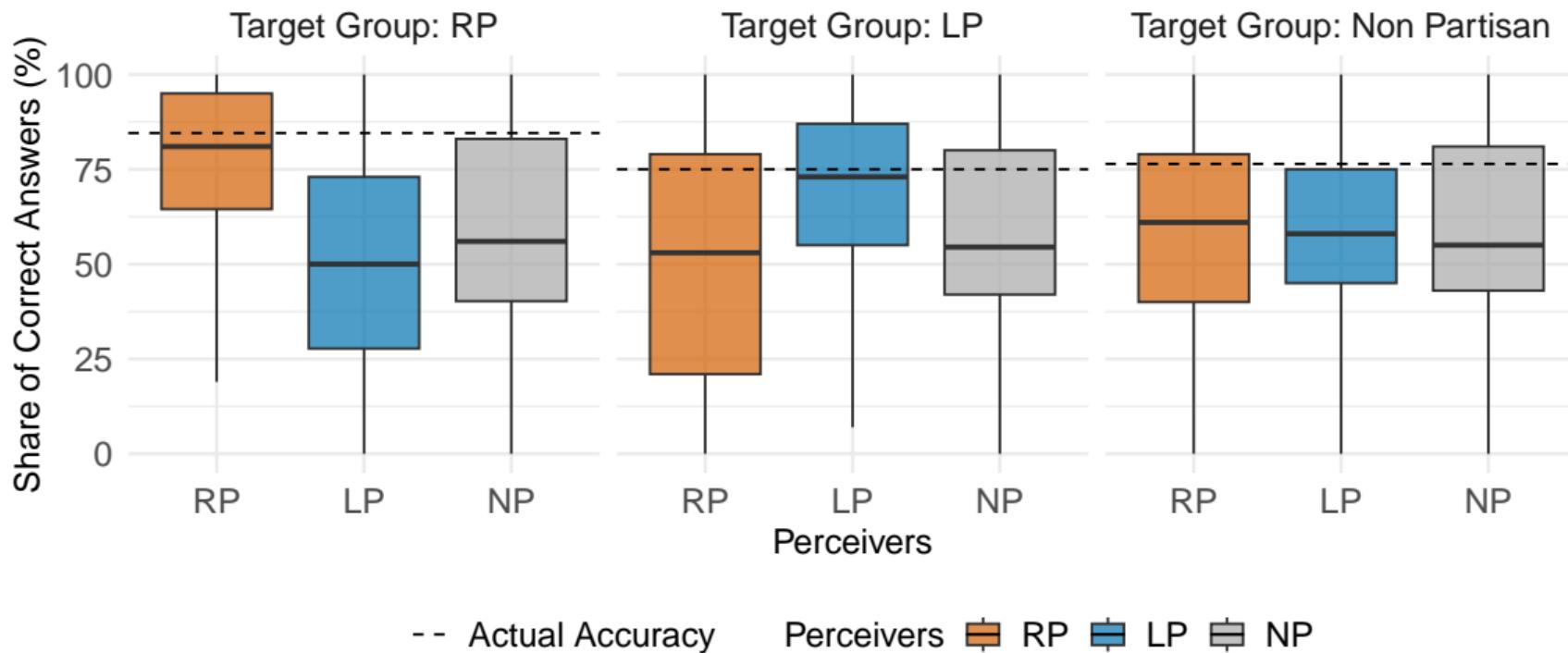
## Fact 10 : China is infiltrating South Korean institutions, aiming to undermine the nation's



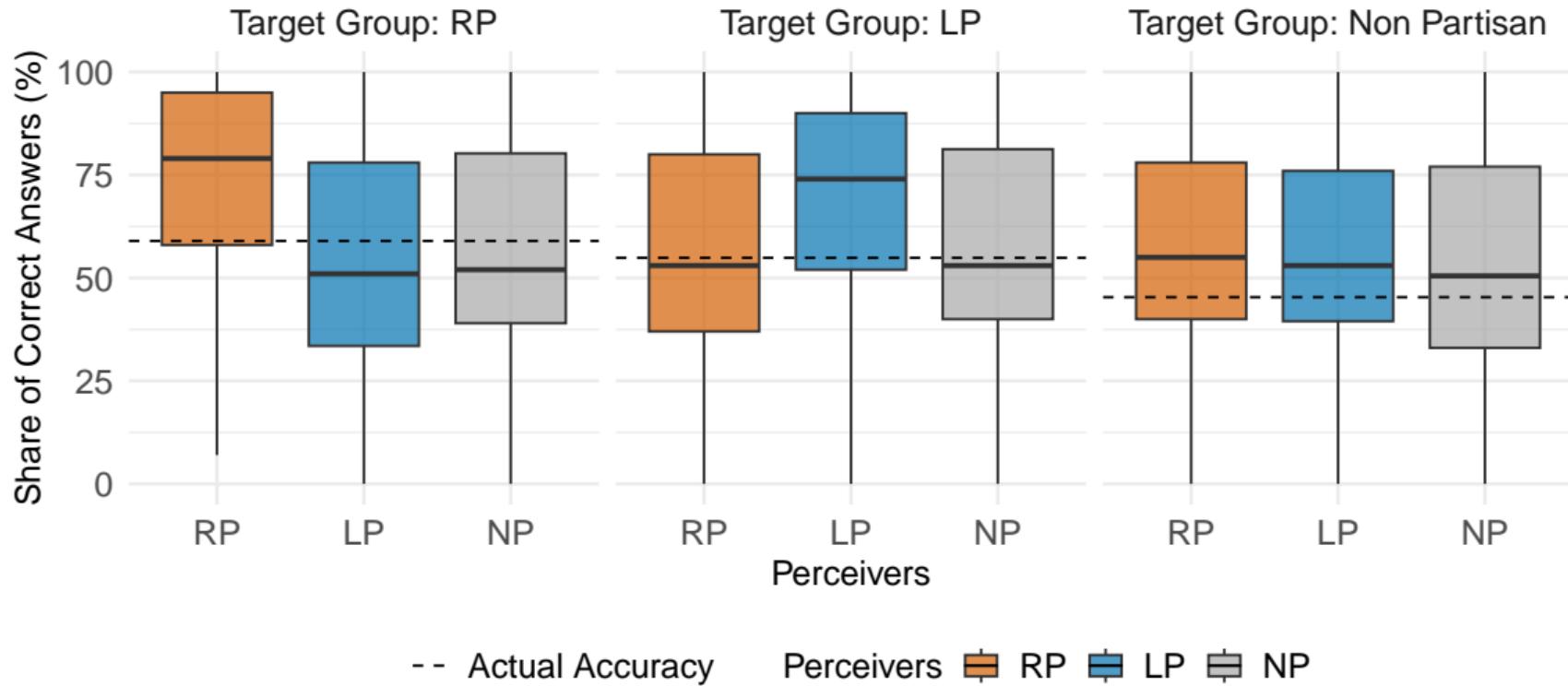
**Fact 11 : The Supreme Court disqualified Lee from the presidential election in collaboration with Yoon Suk Yeol.**



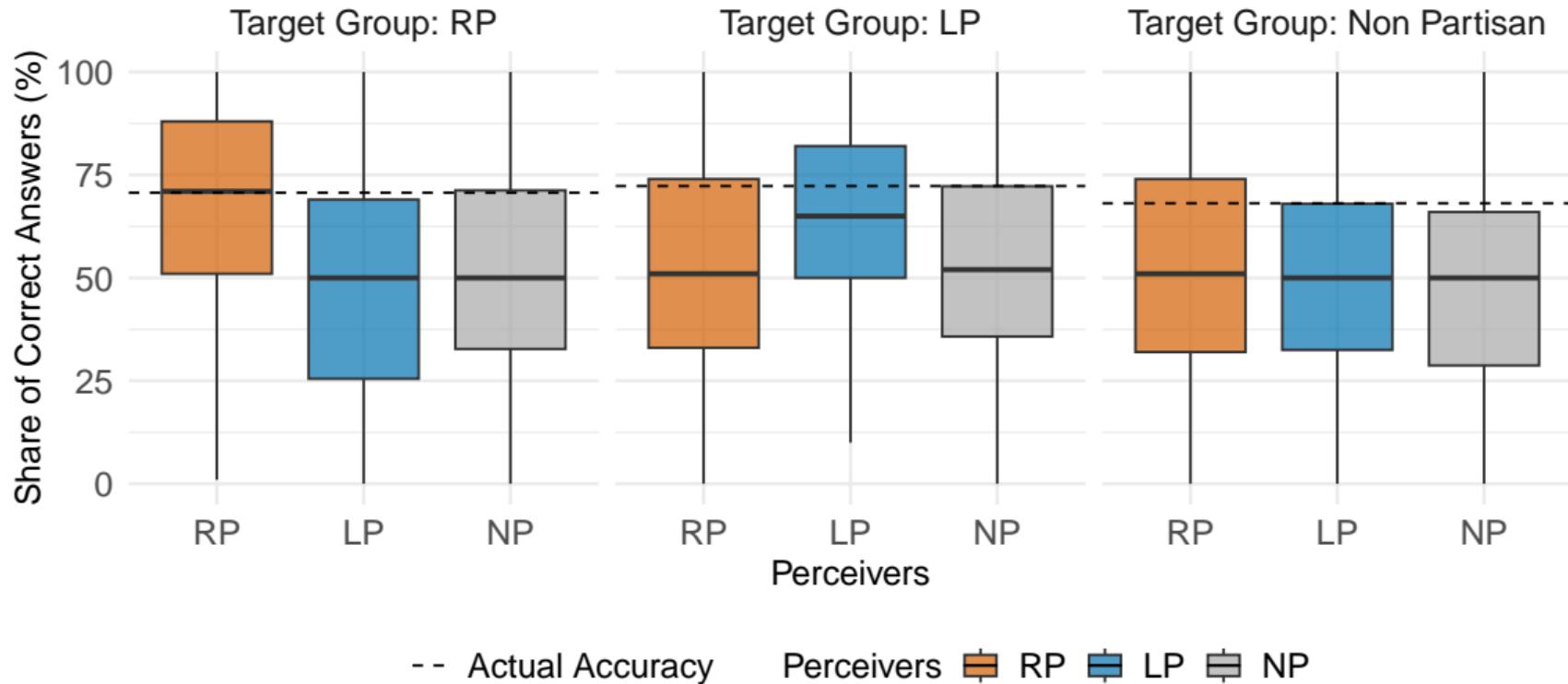
**Fact 12 : U.S. government controls major political decisions in South Korea, including opposition crackdowns.**



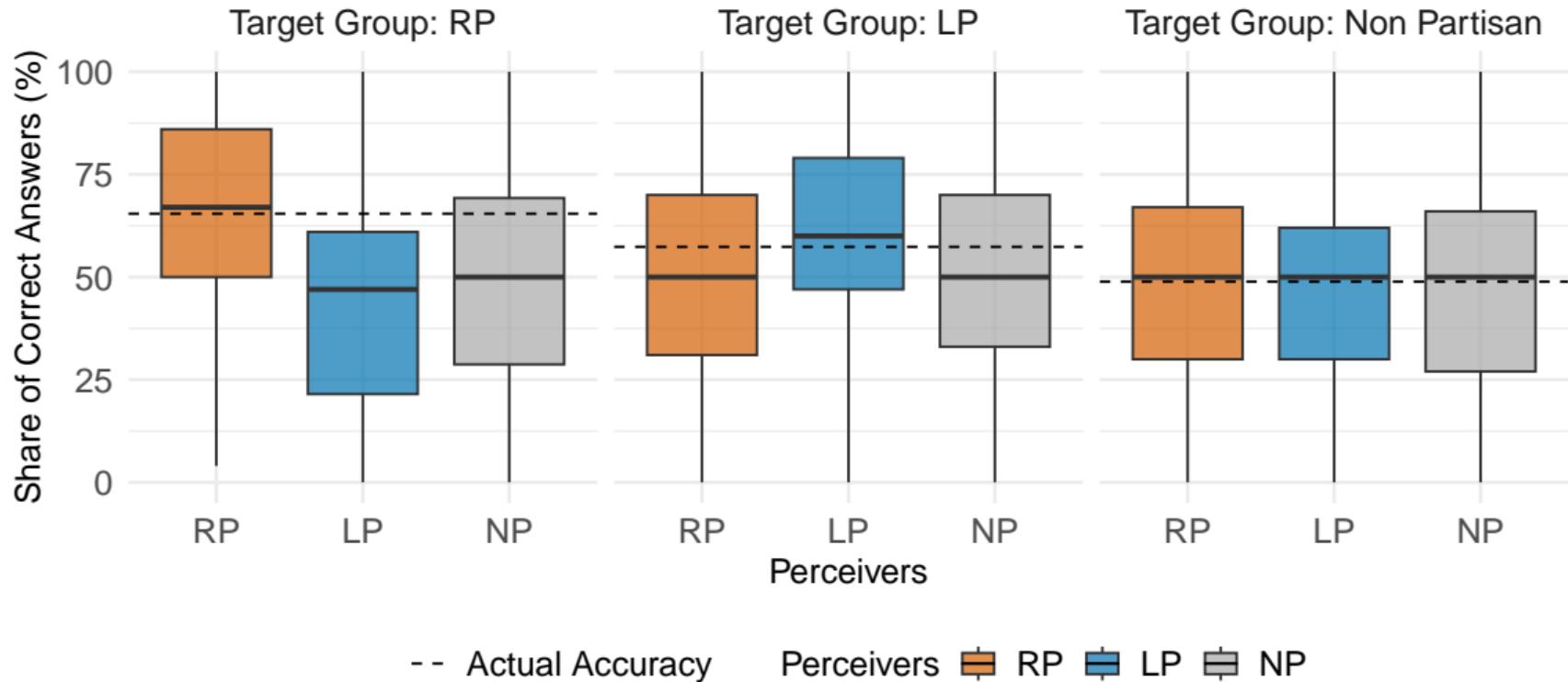
**Fact 1 : The term of office of the Senate is 4 years.**



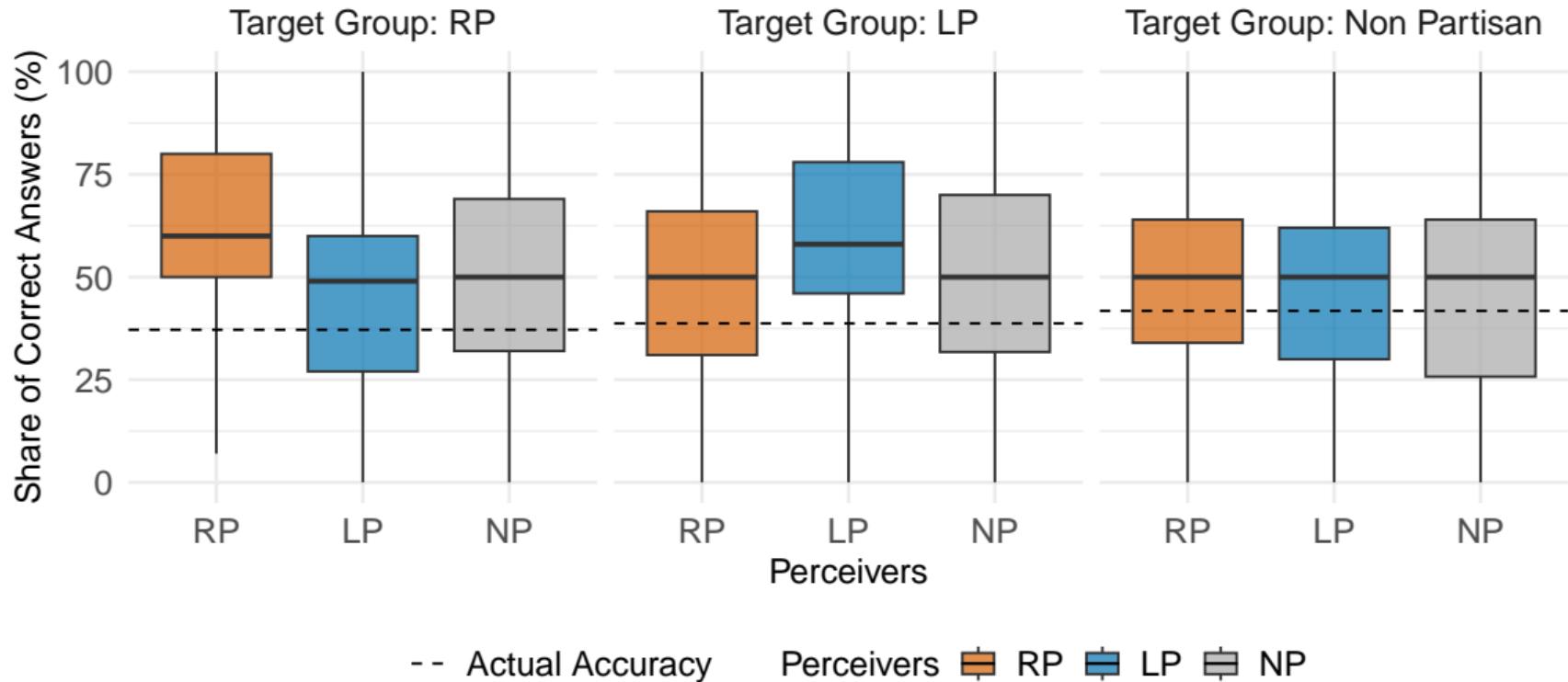
## Fact 2 : To revise the Constitution, approval from more than three-fourths of the state leg



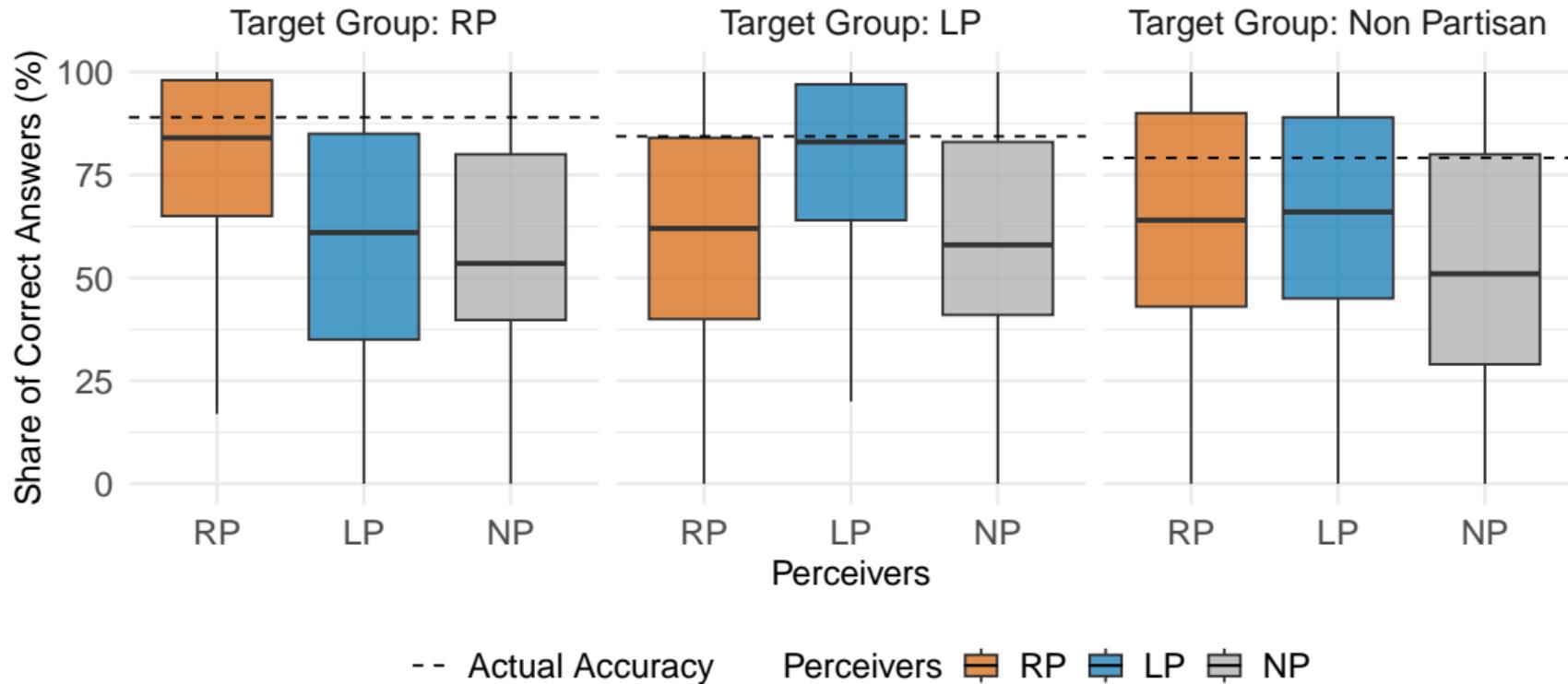
**Fact 3 : The country's nominal GDP growth rate in the previous year was lower than 7%.**



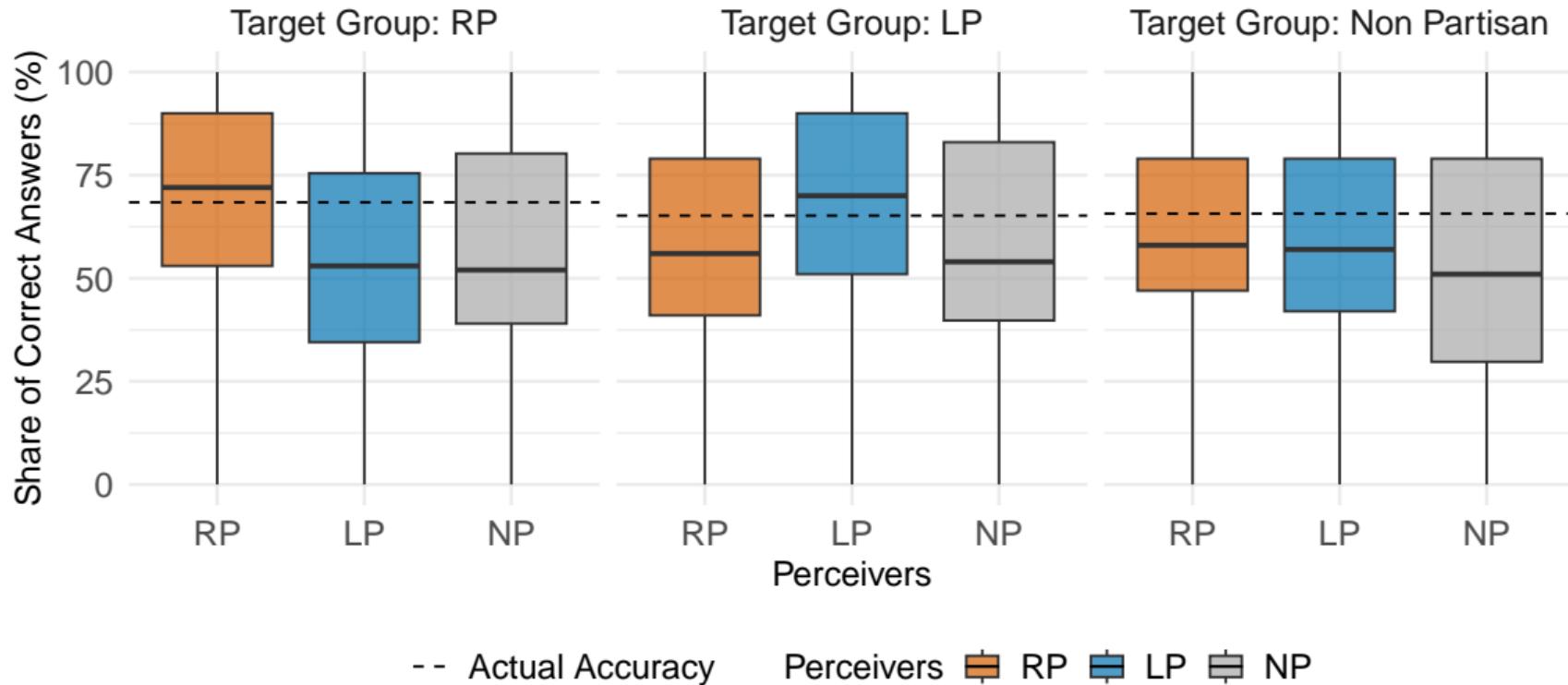
**Fact 4 : For every hundred working-age people, there are forty old-age people who are 6**



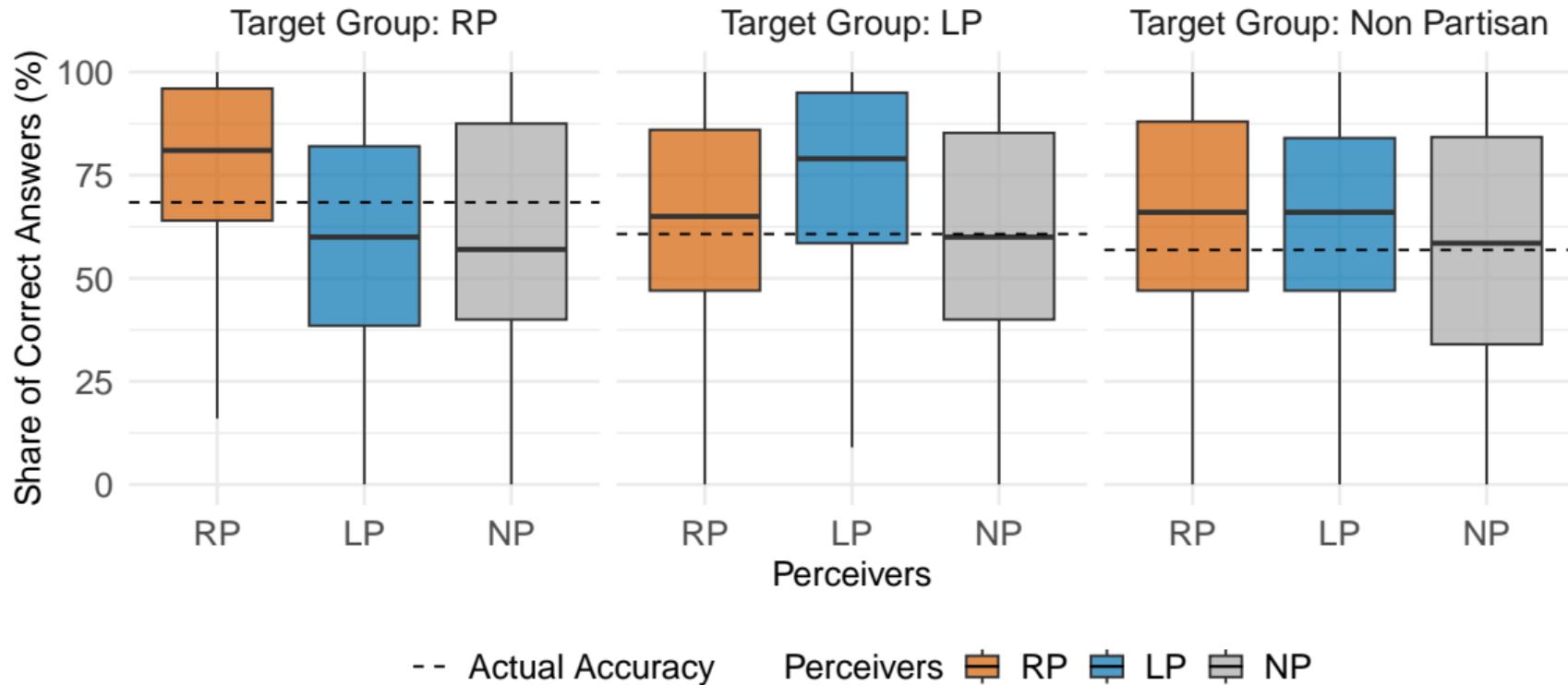
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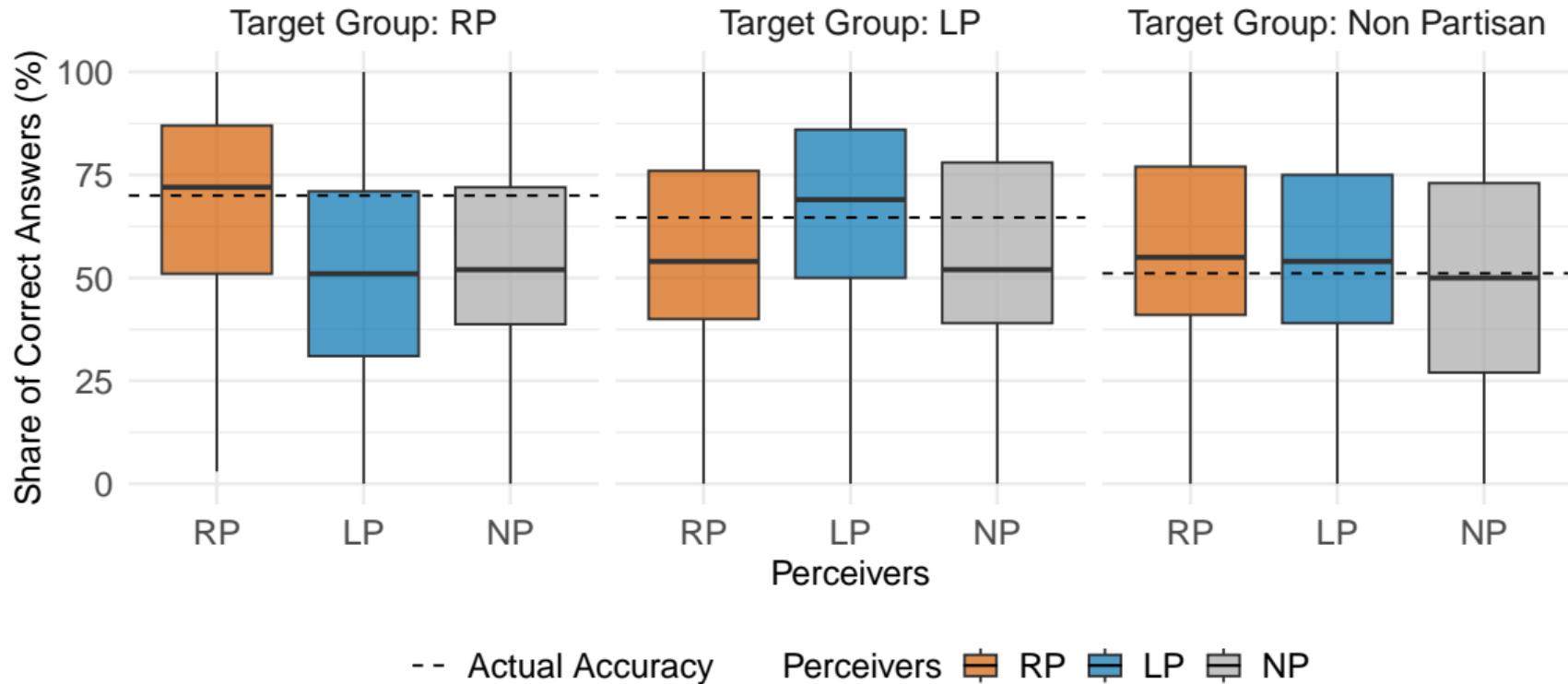
## Fact 6 : iPhone was invented before 2000.



## Fact 7 : The largest state in the United States is Alaska.



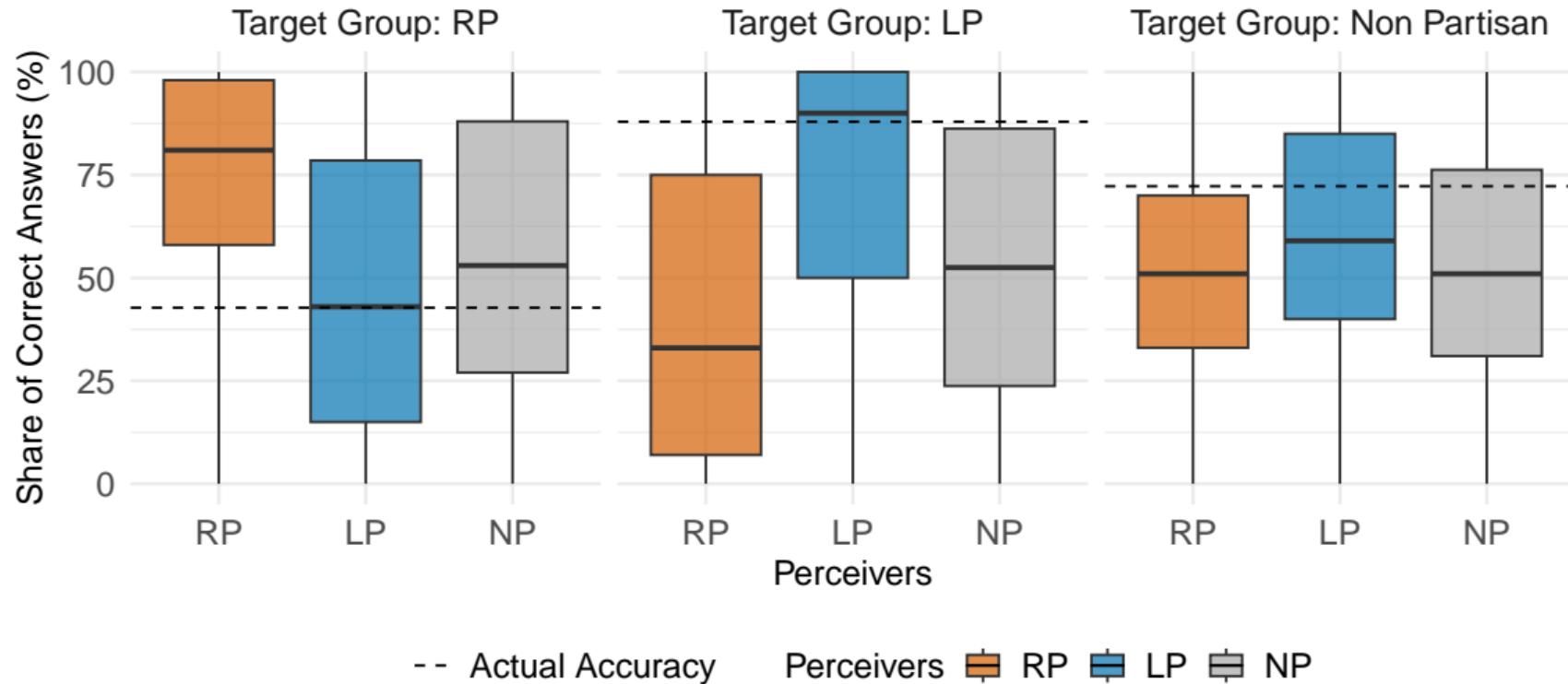
## Fact 8 : The highest mountain in the United States is Denali (formerly known as Mt. McKinley)



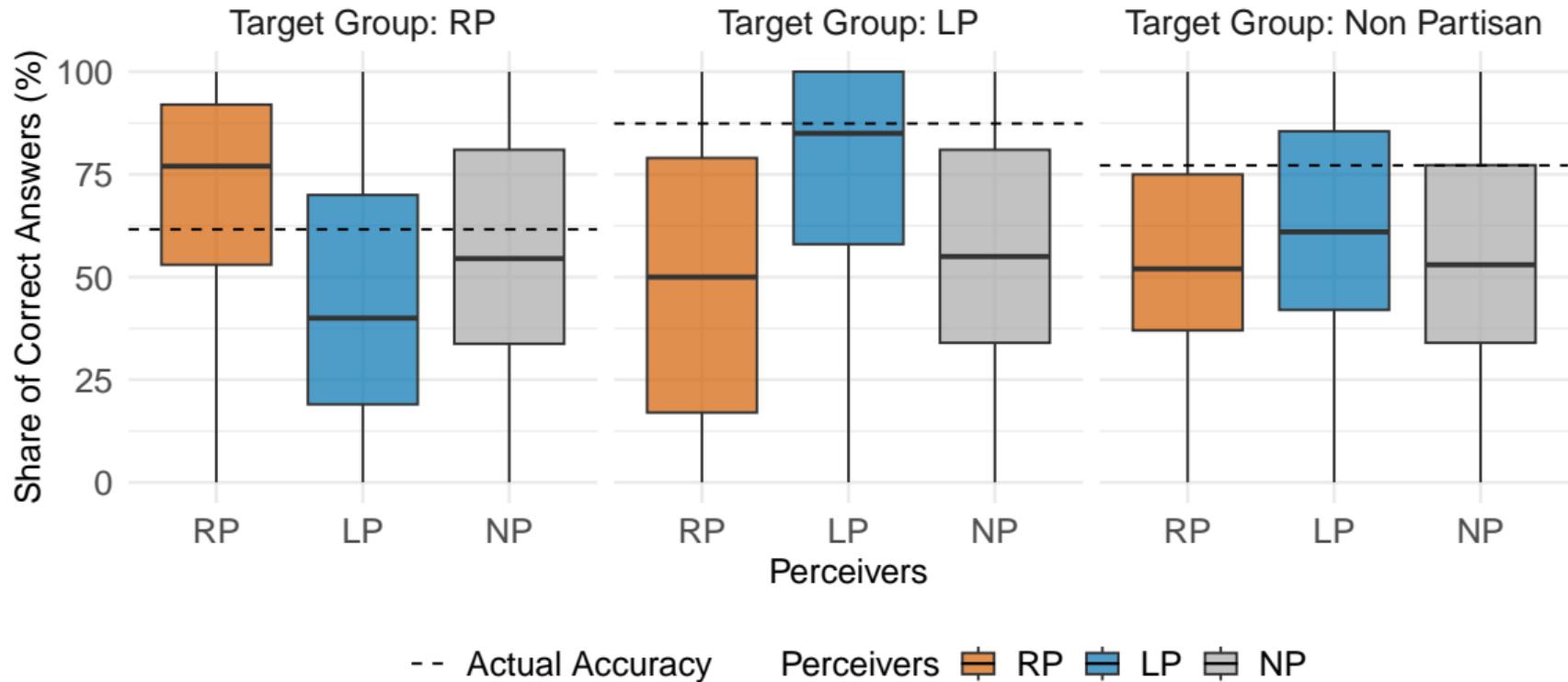
-- Actual Accuracy

Perceivers RP LP NP

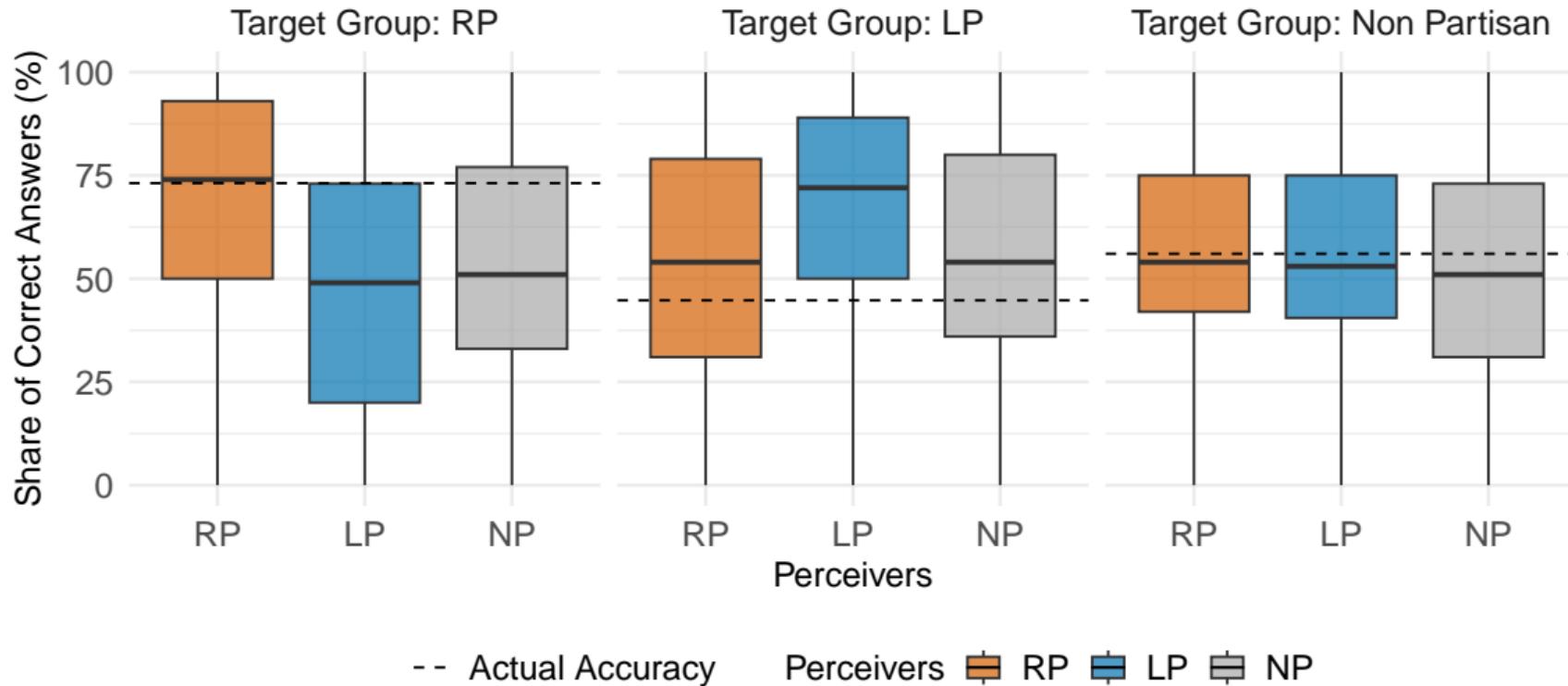
## Fact 9 : The Democratic Party stole the 2020 presidential election.



## Fact 10 : Climate change is a hoax created to push socialist policies and destroy America



## Fact 11 : The Republican administration initiated the Iraq war for oil interests.



## Fact 12 : The Republicans stole the 2024 presidential election.

