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

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Disbelief and Information Processing

- Partisan conflict and contested information
  - Populist radical right parties, rising polarization
  - Fake news, conspiracy theories, “alternative facts”

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- Today: Mechanisms behind stubborn factual disagreement
  - **Disbelief in out-group knowledge**
  - **In-group bias in information processing**

What we find

Survey experiments in the US and South Korea

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3. Correcting disbelief reduces (often completelty eliminates) **in-group bias**
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≈1,500): Document disbelief in out-group knowledge
  - Study 2 (N≈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

Backgroud/Accroym/Abbreviation

- RP: Right-wing parties
  - US: Republican Party–curent 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 the National Assembly are 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
  - $p^t_{i,j}$: individual i’s estimate on group t’s accuracy rate on task j
  - $t \in \{RP, LP, NP\}$, $j = 1, ..., 8$

▸ Sum. Stat.

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
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%.

	0	10	20	30	40	50	60	70	80	90	100
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
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- Perceiver-based Disbelief
  - RP supporters are seen as more knowledgeable by RP than LP
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  - LP supporters are seen as more knowledgeable by LP than RP
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- Today: focus on Target-based Disbelief (both are almost identical)

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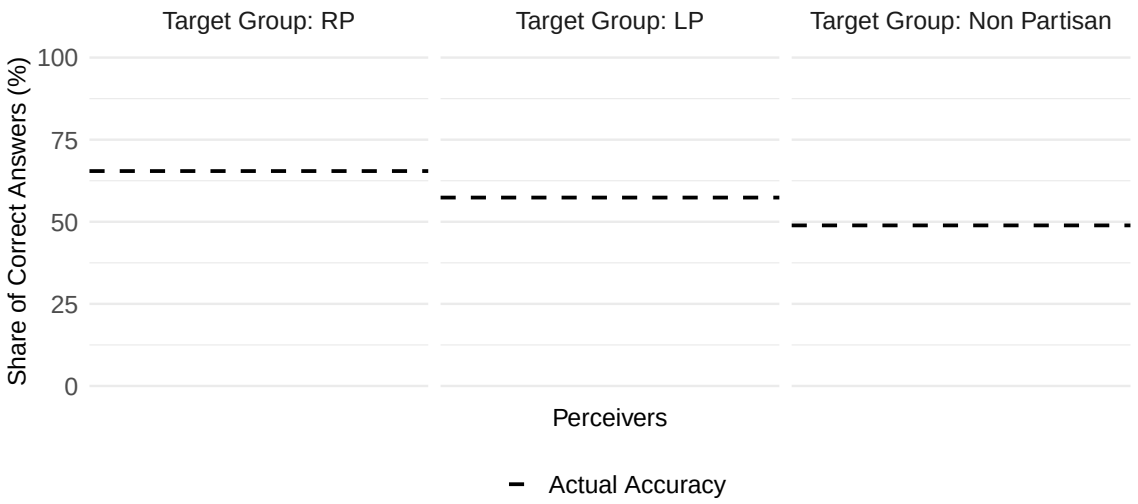
US Fact 3: GDP growth rate is less than 7% ▸ Sum. Stat.



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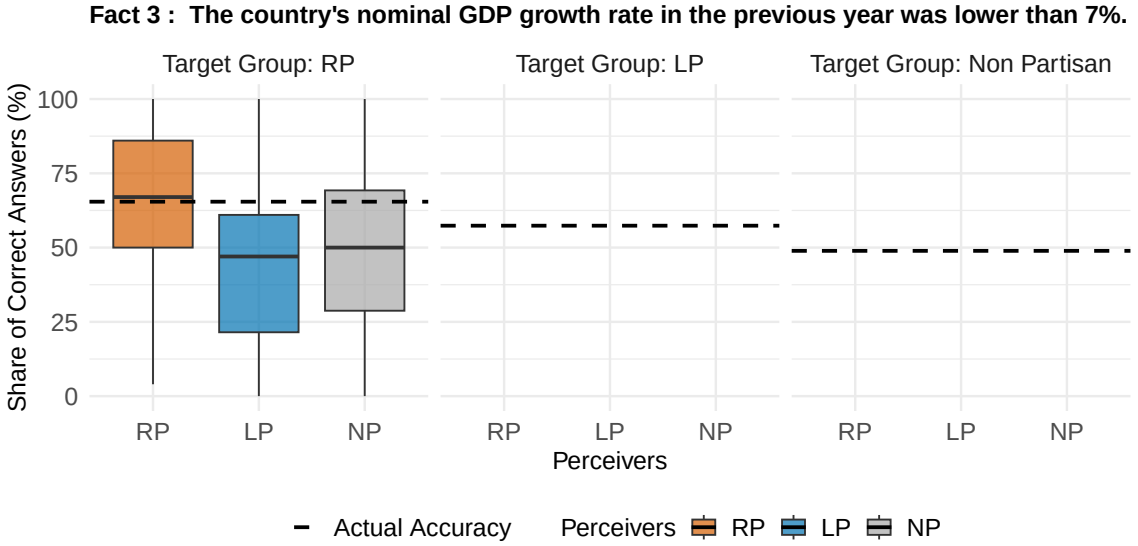

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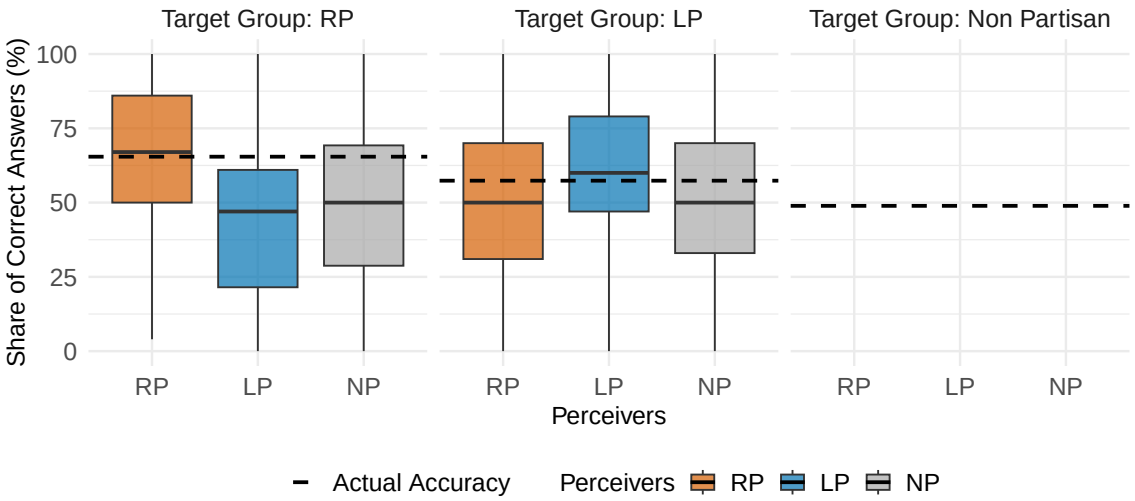

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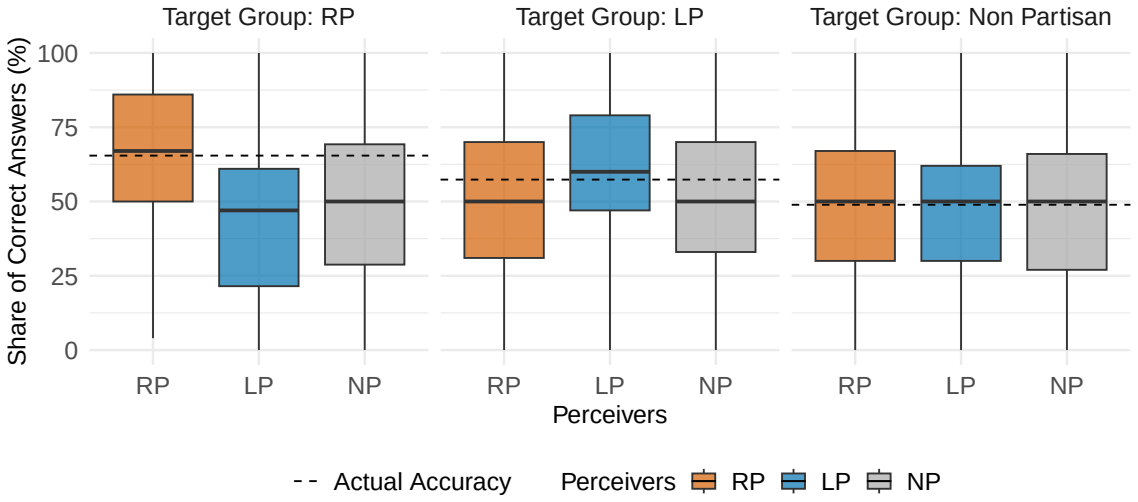

SK Fact 3: GDP growth rate is less than 5%

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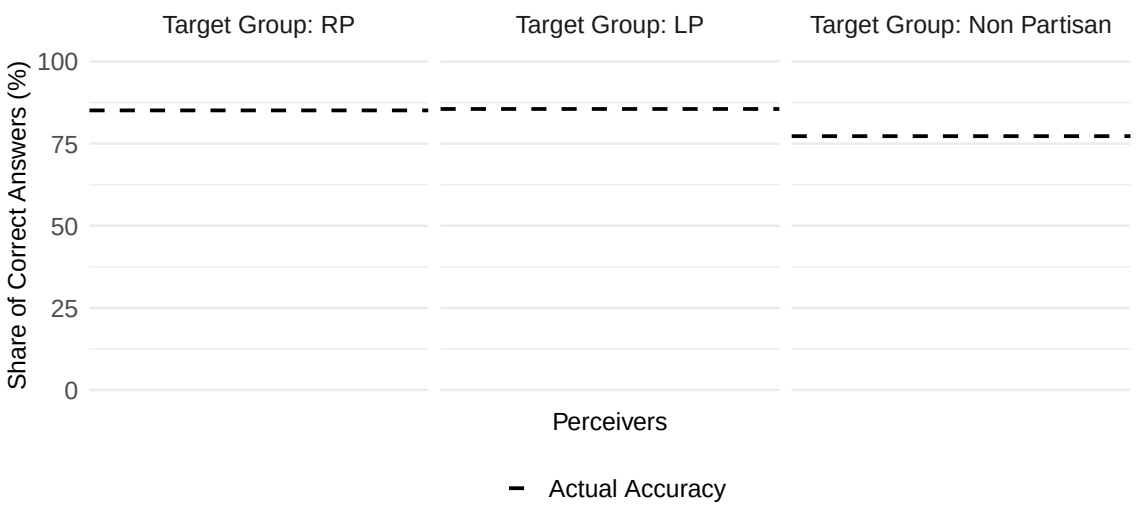

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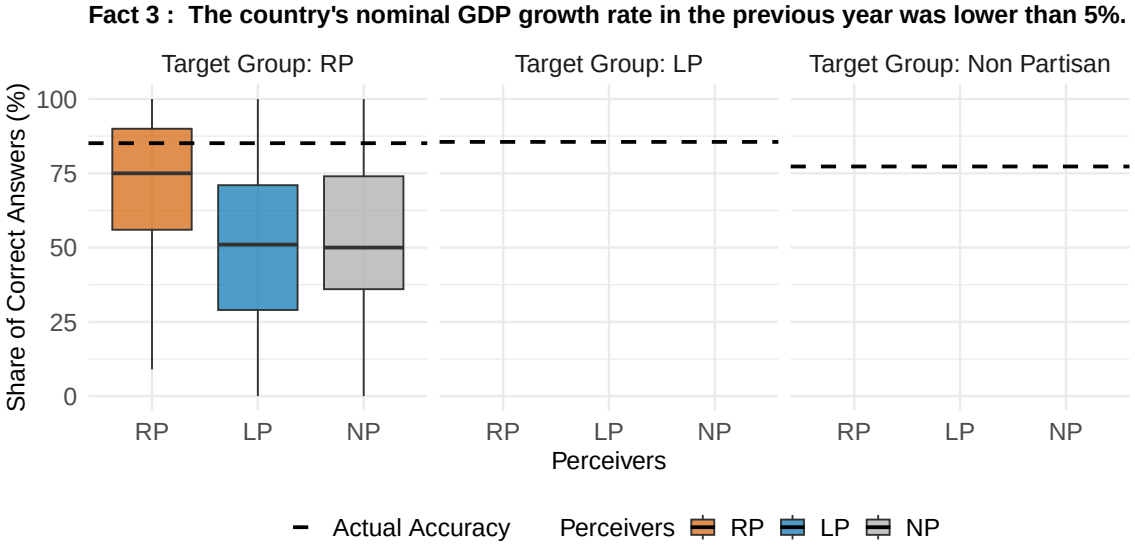

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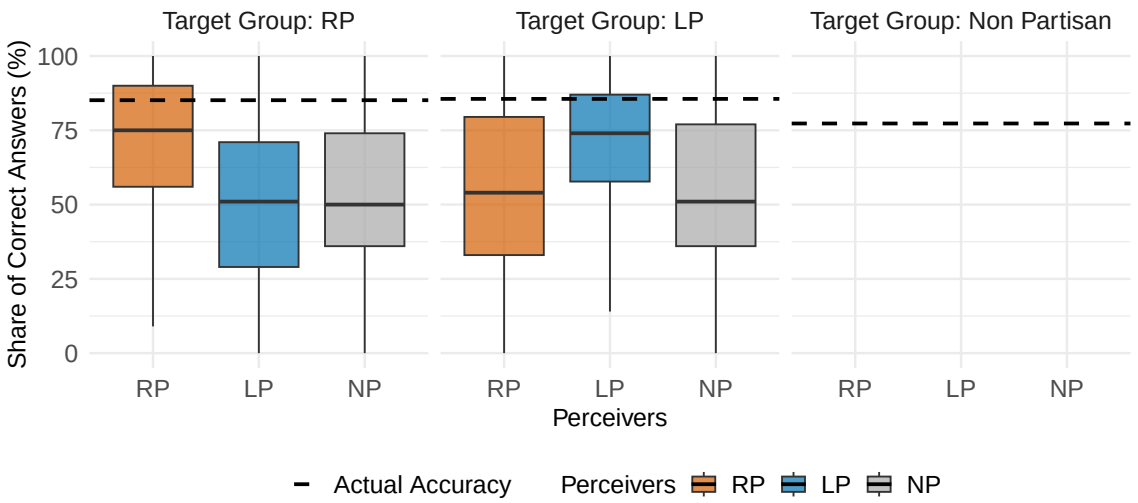
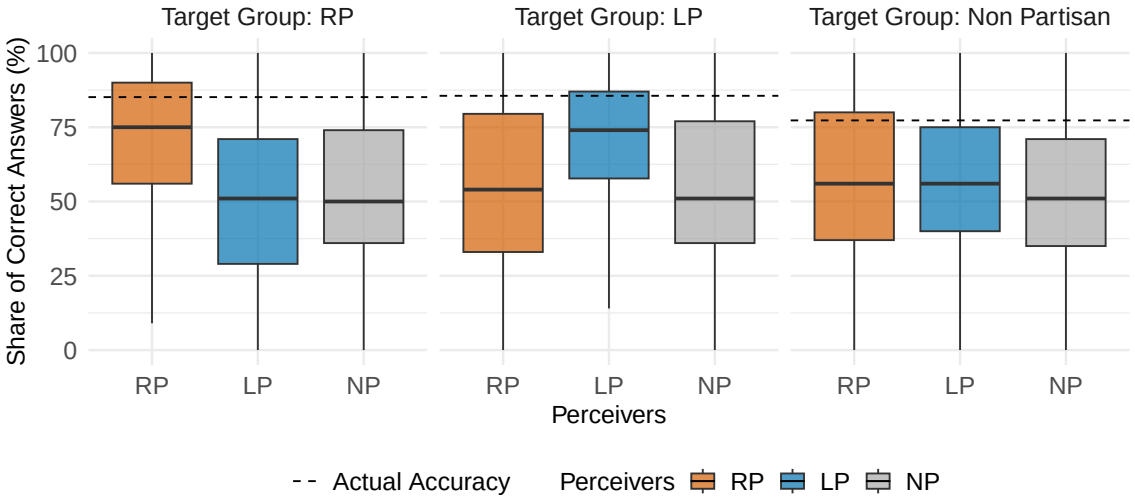


SK Fact 3: GDP growth rate is less than 5% ▸ Sum. Stat.

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



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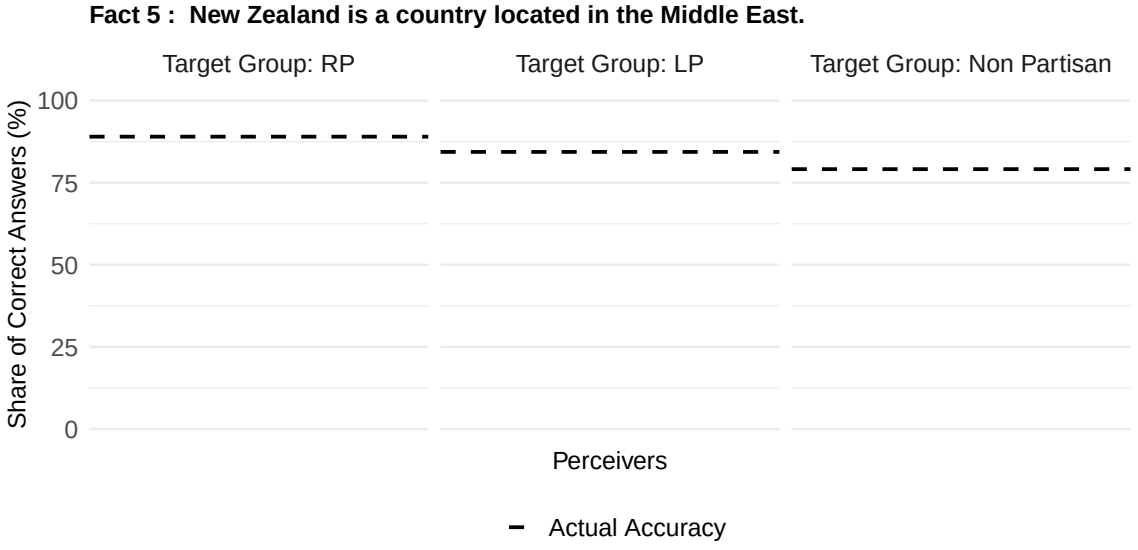

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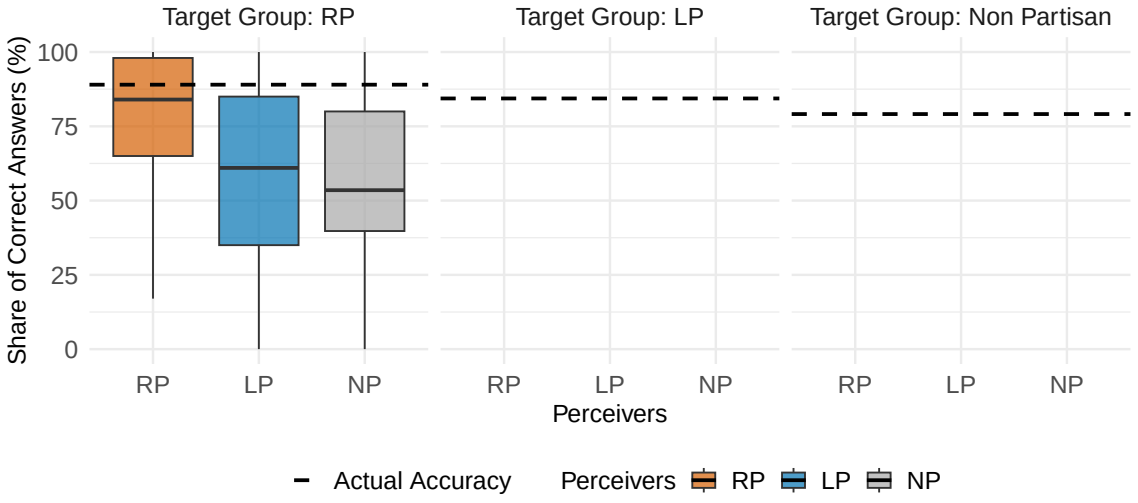

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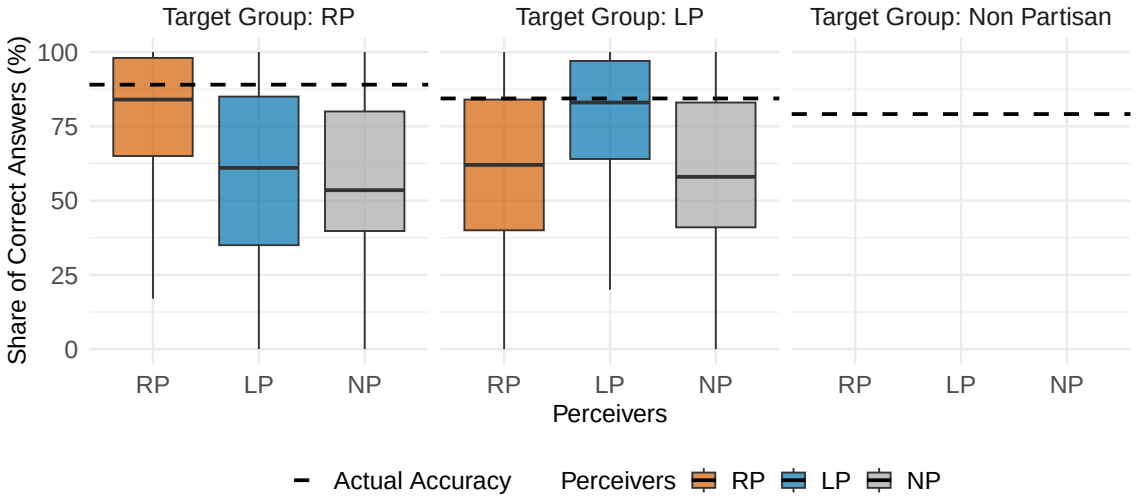

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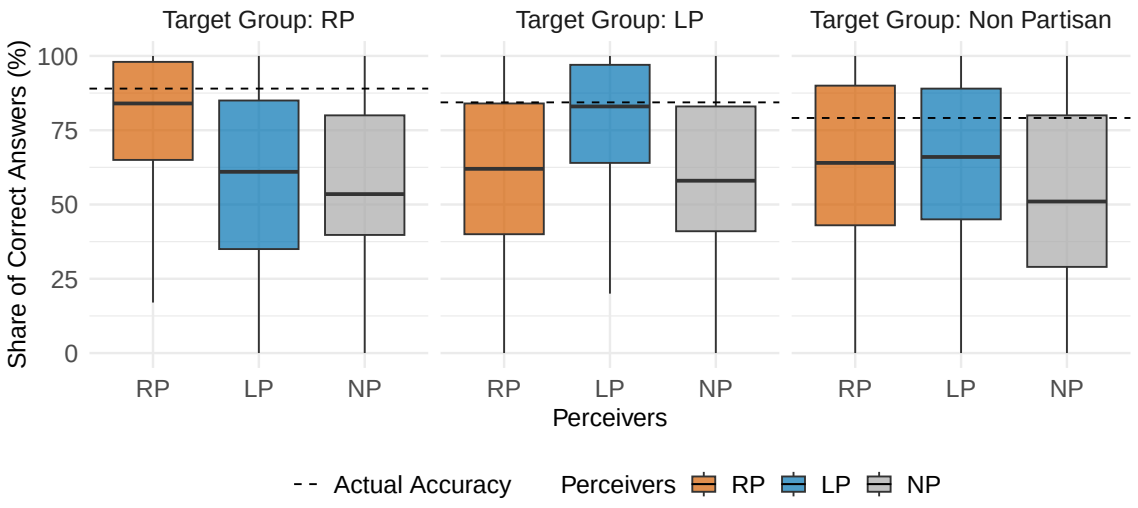

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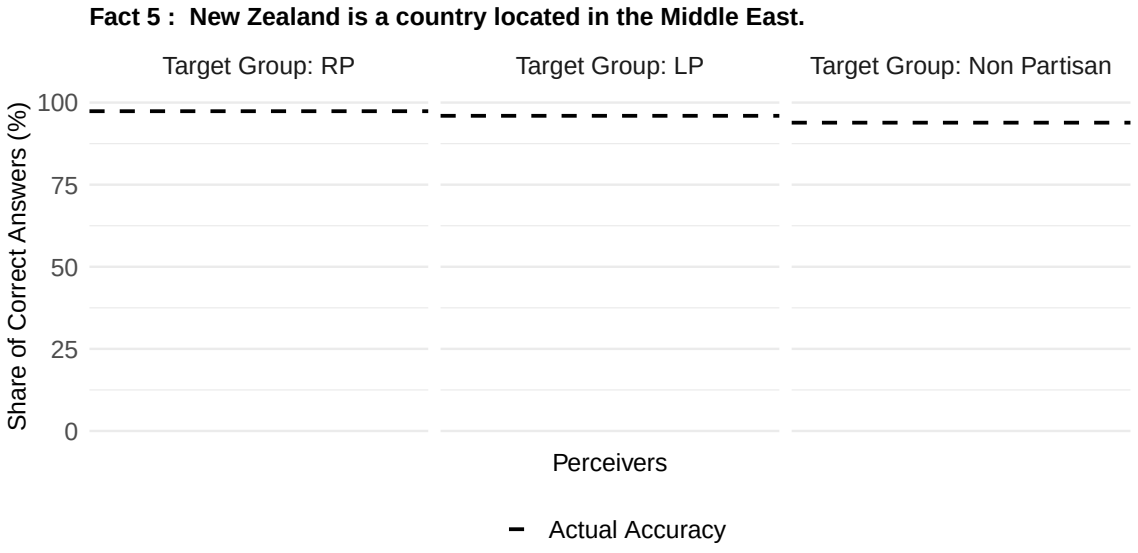

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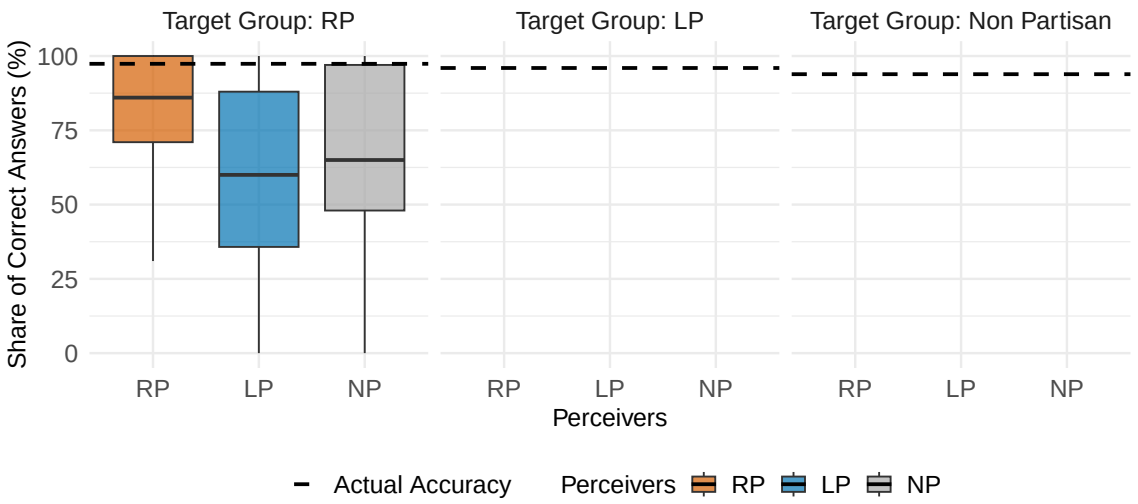

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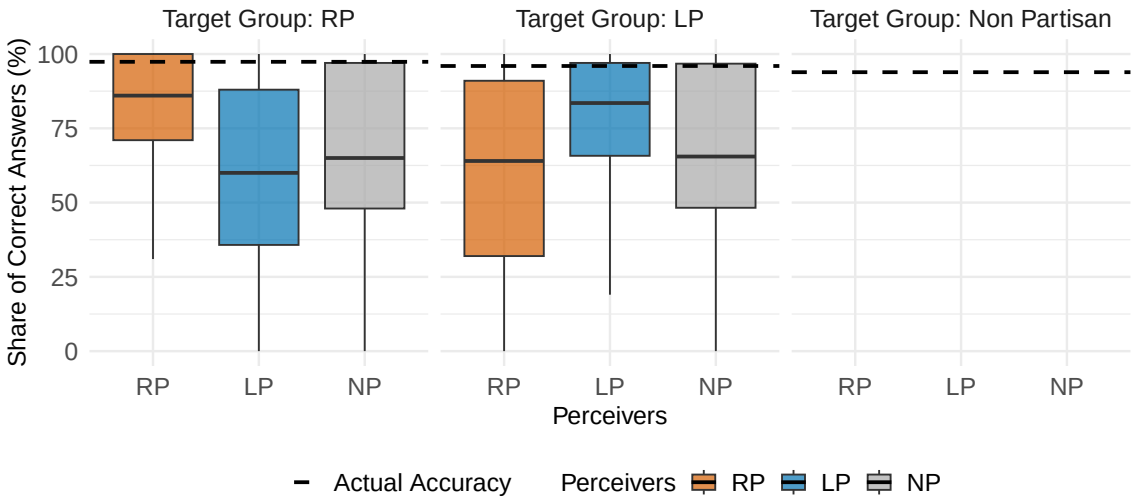

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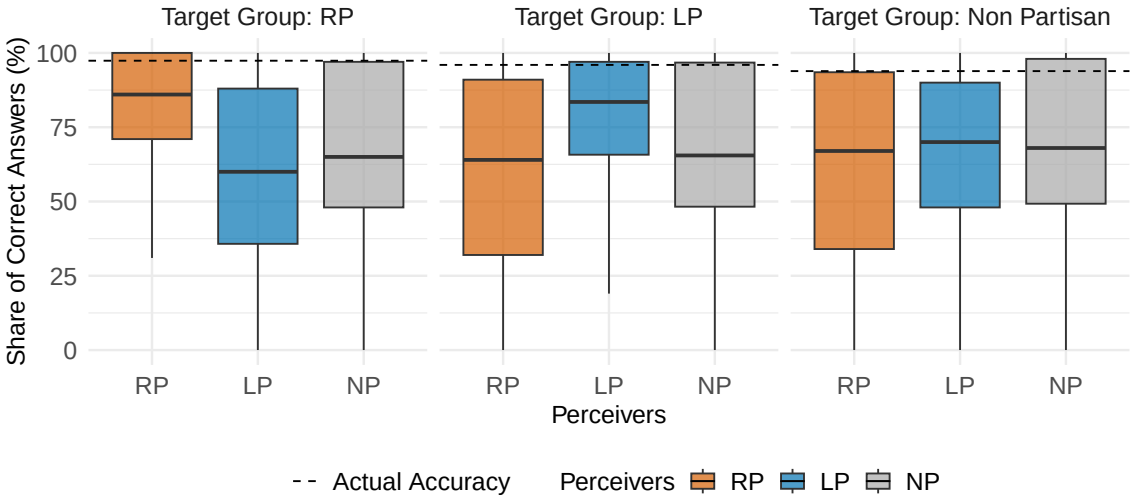
Fact 5 : New Zealand is a country located in the Middle East.



More Systematic Approach for Average Disbelief

▸ Sum. Stat.

- $p^t_{i,j}$: Accuracy rate of group $t \in \{RP, LP\}$ in task j perceived by i, $g(i)$ i's group

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- Target-based Partisan Disbelief (given perceiver i)

$$p^t_{i,j} = \beta_1 \mathbb{1}\{t = RP\} + \eta_i + \eta_j + \varepsilon^t_{i,j}$$

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  - Expect $\beta_1 > 0$ if $g(i)$ =RP and $\beta_1 < 0$ if $g(i)$ =LP

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- Null for Non-partisan (given perceiver i, $g(i)$ =NP)

$$p^t_{i,j} = \beta_2 \mathbb{1}\{t = RP\} + \eta_i + \eta_j + \varepsilon^t_{i,j}$$

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$$p^t_{i,j} = \beta_2 \mathbb{1}\{t = RP\} + \eta_i + \eta_j + \varepsilon^t_{i,j}$$

  - Expect $\beta_2 = 0$

Average Disbelief is about 15-17 points ▸ Sum. Stat.

Country Perceiver	SK RP (1)	SK LP (2)	SK NP (3)	US RP (4)	US LP (5)	US NP (6)
Target = RP						
Target = LP						
Observations	8232	14304	10992	13752	13512	8736

- Note: targets are RP or LP; by fixed perceiver groups, individual + task FEs

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Target = RP	0.174 (0.012)					
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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

- Note: targets are RP or LP; by fixed perceiver groups, individual + task FEs

Correltion with Affective Polarization

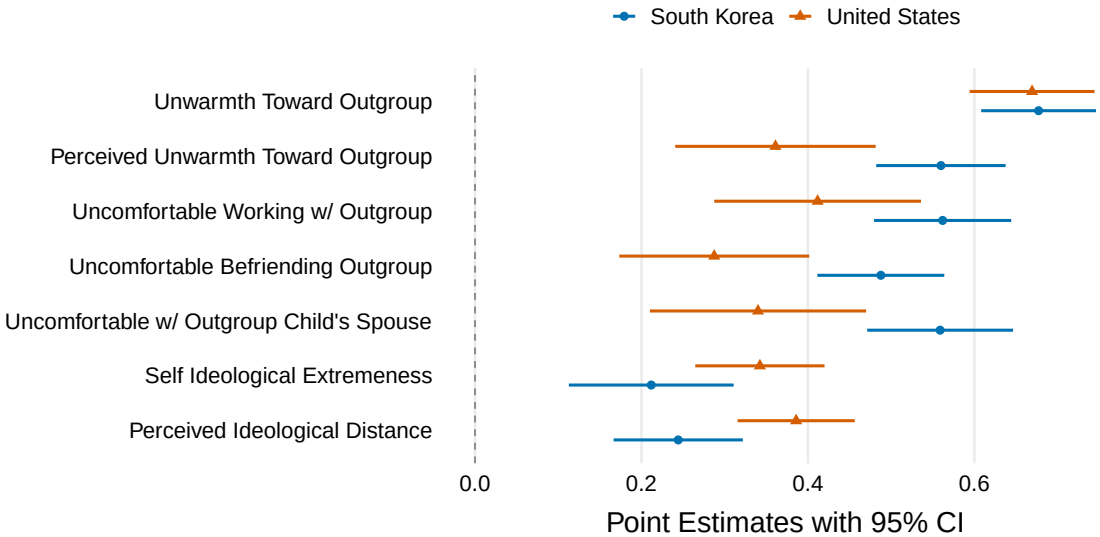
- Define “disbelief”: simple difference between estimates for in-group and out-group

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

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

- Regress different polarization measures on 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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Given the baseline results in Study 1, we want to

- Document **in-group bias in Information Processing**
  - e.g., RP overweighs the opinion of RP over that of LP

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Given the baseline results in Study 1, we want to

- Document **in-group bias in Information Processing**
  - e.g., RP overweighs 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)

1. Demographic questions

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4. Post-treatment judgement questions with **signals** *(details: next slide)*
   (Random at indiv. level within each question)
   - In-group signal: tells that in-groups know the correct answers
   - Out-group signal: tells that out-groups know the correct answers

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Only keep RP/LP w/ pre-treatment disbelief $>$ 5pt (2305 in SK, 2792 in US)

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   - "According to previous surveys, the majority of RP says False"
   - "According to previous surveys, the majority of LP says False"

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2. Signal (Random at indiv. level within each question)
   - "According to previous surveys, the majority of RP says False"
   - "According to previous surveys, the majority of LP says False"
3. Post-signal
   - Re-judge T/F + give confidence (0-100)

Study 2: Signals in Post-Treatment Questions

Example: *"New Zealand is in the Middle East"* (False)

1. Pre-signal (same as Study 1)
   - Judge T/F + give confidence (0-100)
   - Estimate the accuracy rate of RP/LP
2. Signal (Random at indiv. level within each question)
   - "According to previous surveys, the majority of RP says False"
   - "According to previous surveys, the majority of LP says False"
3. Post-signal
   - Re-judge T/F + give confidence (0-100)

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

Hypotheses:

Hypotheses:

- H1: Treatment decreases post-treatment disbelief
  - Not just a manipulation check
  - Pre- and post-treatment questions are different

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- H1: Treatment decreases post-treatment disbelief
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  - Pre- and post-treatment questions are different
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- H3: Treatment decreases the in-group bias in information processing

Hypotheses:

- H1: Treatment decreases post-treatment disbelief
  - Not just a manipulation check
  - Pre- and post-treatment questions are different
- H2: Partisans have in-group bias in information processing
- H3: Treatment decreases the in-group bias in information processing
- H4: Treatment decreases affective polarization

Today's Plan

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Conclusion

H1: Treatment Reduces Disbelief by 20% - 35%

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

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

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

▸ Conspiracy ▸ Sum. Stat.

H1: Treatment Reduces Disbelief by 20% - 35%

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

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

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

▸ Conspiracy ▸ Sum. Stat.

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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: $y^J_{i,j} \equiv \mathbb{1}\{ J^1_{i,j} - J^0_{i,j} > 0\}$;

Measurement of In-group Bias in Information Processing

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1. Correct Judgement: $y^J_{i,j} \equiv \mathbb{1}\{ J^1_{i,j} - J^0_{i,j} > 0\}$;
   - $J^0_{i,j}$: Correctness before signals ($J^0_{i,j} = 1$ if Correct and $= 0$ if Wrong)
   - $J^1_{i,j}$: 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: $y^J_{i,j} \equiv \mathbb{1}\{ J^1_{i,j} - J^0_{i,j} > 0\}$;

2. Confidence towards Correct Answer: $y^{\mu}_{i,j} \equiv \mathbb{1}\{\mu^1_{i,j} - \mu^0_{i,j} > 0\}$;
   - $\mu^0_{i,j}$: Confidence towards Correct answers before signals

$$\mu^0_{i,j} = \begin{cases} \frac{a^0_{i,j}}{100} & \text{if } J^0_{i,j} = 1 \\ 1 - \frac{a^0_{i,j}}{100} & \text{if } J^0_{i,j} = 0 \end{cases}$$

     where $a^0_{i,j} \in [0, 100]$ is confidence level for their answer
   - $\mu^1_{i,j}$: 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, $y^J_{i,j}$ or $y^{\mu}_{i,j}$
- $\mathbb{1}\{\text{In-group Signal}\}_{i,j}$: 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) SK Dummy	(2) SK Continuous	(3) US Dummy	(4) US Continuous
In-Group Signal				
Observations	3417	3417	4221	4221
Mean of outcome	0.102	0.424	0.170	0.481

▸ Education Signal ▸ Sum. Stat.

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

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

▸ Education Signal ▸ Sum. Stat.

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Conclusion

H3: Treatment of Correcting Disbelief

- Study 1: Accuracy rates are the same across partisans for factual questions

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

H3: Treatment of Correcting Disbelief

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- Pre-treatment task of Study 2: individuals again guess the accuracy rate
- Keep only those who have disbelief ($>$5pt) on Out-group Knowlege (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)

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

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

▸ Sum. Stat.

H3: Treatment, In-group Bias in Information Processing

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

	(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

▸ Sum. Stat.

H3: Treatment, In-group Bias in Information Processing

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

	(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

▸ Sum. Stat.

H3: Treatment, In-group Bias in Information Processing

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

	(1) SK Dummy	(2) SK Continuous	(3) US Dummy	(4) US Continuous
In-Group Signal	0.058	0.078		
	(0.010)	(0.009)		
Treatment	0.016	0.023		
	(0.009)	(0.019)		
In-Group Signal x Treatment	-0.031	-0.060		
	(0.002)	(0.028)		
Observations	6915	6915	8376	8376
Mean of outcome	0.103	0.421	0.165	0.484

▸ Sum. Stat.

H3: Treatment, In-group Bias in Information Processing

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

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

▸ Sum. Stat.

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Conclusion

H4: Effects on Correcting Disbelief on Polarization

Specification (LHS: Combined measures of affective polarization)

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

- **Unfav**orable measure (unwarmth measure)
- **Uncomf**ortable with out-groups' colleagues/friends/spouses of children...

H4: Effects on Correcting Disbelief on Polarization

Specification (LHS: Combined measures of affective polarization)

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

- **Unfav**orable measure (unwarmth measure)
- **Uncomf**ortable with out-groups' colleagues/friends/spouses of children...

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

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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

Study 1: Summary Statistics

Back

	SK RP	SK LP	SK NP	US RP	US LP	US NP
Demographics						
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
Judgements						
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

Back

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

Today's Plan

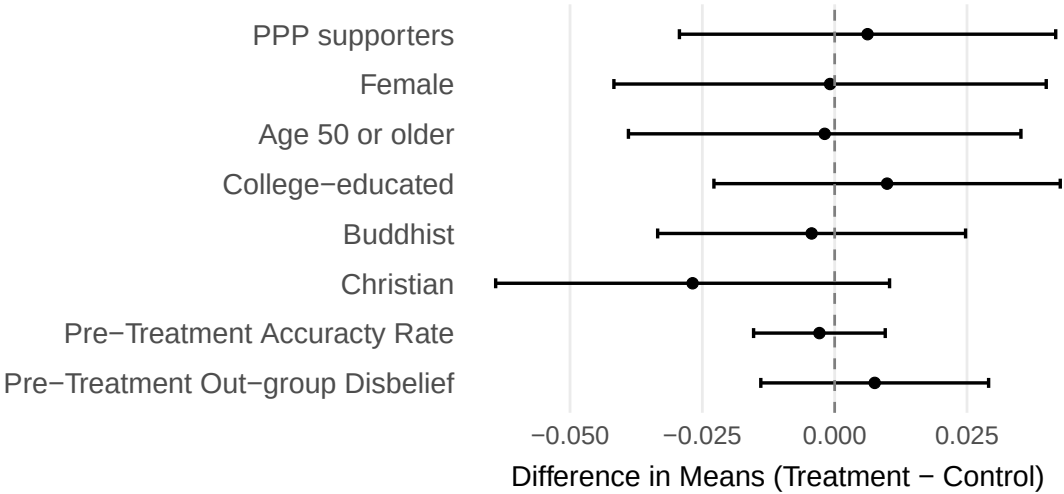
Summary Statistics

Further Results
- Balanced Test
- Conspiracy Theory
- Education Signal

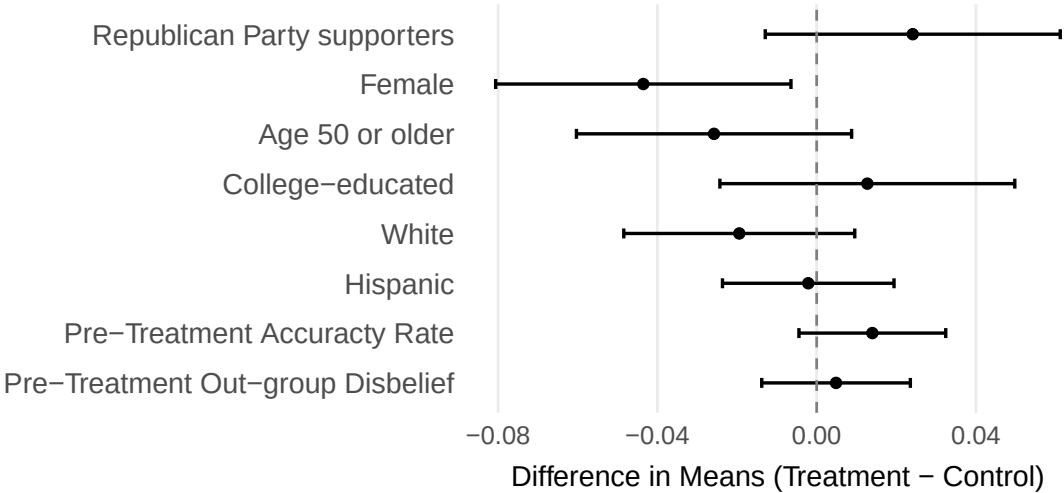
Appendix: Disbelief on All Facts

Today's Plan

H3: Balanced Test across Control and Treated



H3: Balanced Test across Control and Treated



Today's Plan

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Appendix: Disbelief on All Facts

H1-A: Treatment Reduces Disbelief in Conspiracy Theory

Back

	(1) SK	(2) US
Treatment	-0.028	-0.066
	(0.015)	(0.013)
Observations	2305	2792
Mean of outcome	0.343	0.239

Today's Plan

H2: Partisan bias is larger than education-based bias

South Korea:

- Compare information processing based on college vs non-college signals
- Restrict samples to control group whose pre-signal answers were wrong

	(1) Dummy Educ	(2) Dummy Educ	(3) Dummy Party	(4) Cont. Educ	(5) Cont Educ	(6) Cont Party
In-Group Signal		-0.004	0.173		-0.024	0.140
		(0.006)	(0.016)		(0.001)	(0.021)
College Signal	0.007			0.000		
	(0.001)			(0.022)		
Observations	1185	1185	1133	1185	1185	1133
Mean of outcome	0.070	0.070	0.309	0.257	0.257	0.530

Back

H2: Partisan bias is larger than education-based bias

United States:

- Compare information processing based on college vs non-college signals
- Restrict samples to control group whose pre-signal answers were wrong

	(1) Dummy Educ	(2) Dummy Educ	(3) Dummy Party	(4) Cont Educ	(5) Cont Educ	(6) Cont Party
In-Group Signal		-0.038	0.021		-0.038	0.090
		(0.038)	(0.021)		(0.014)	(0.017)
College Signal	0.032			0.057		
	(0.027)			(0.030)		
Observations	827	827	1544	827	827	1544
Mean of outcome	0.522	0.522	0.466	0.606	0.606	0.532

Back

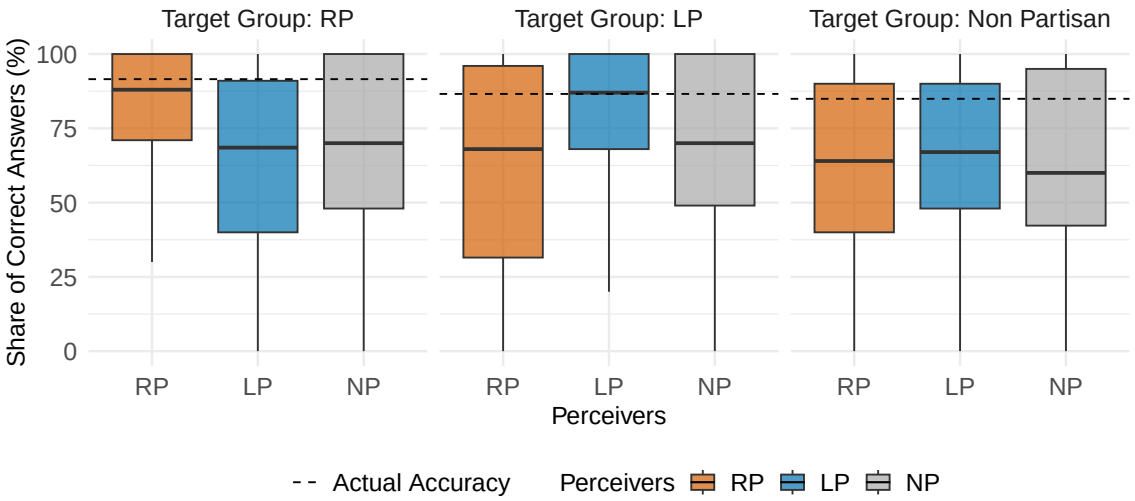
Today's Plan

Summary Statistics

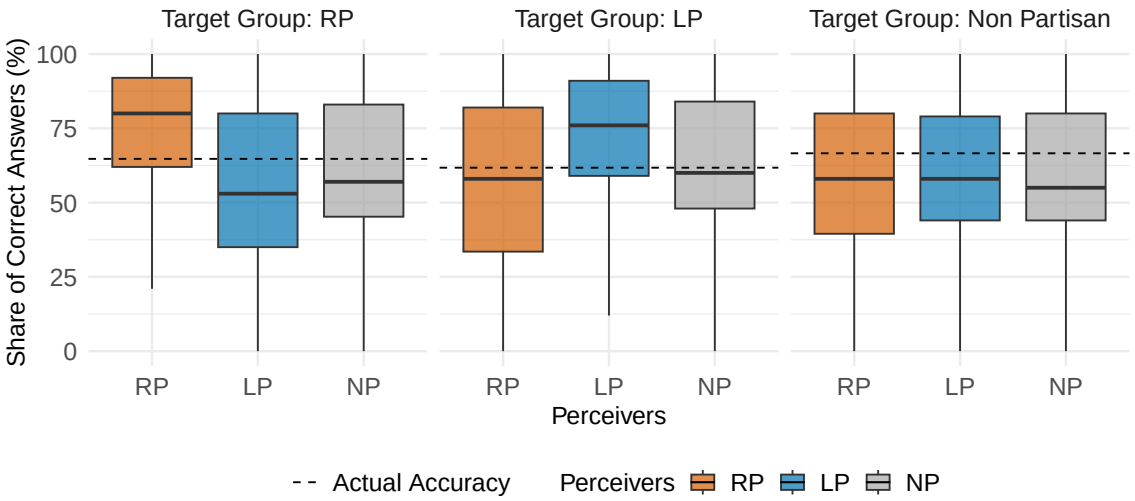
Further Results
- Balanced Test
- Conspiracy Theory
- Education Signal

Appendix: Disbelief on All Facts

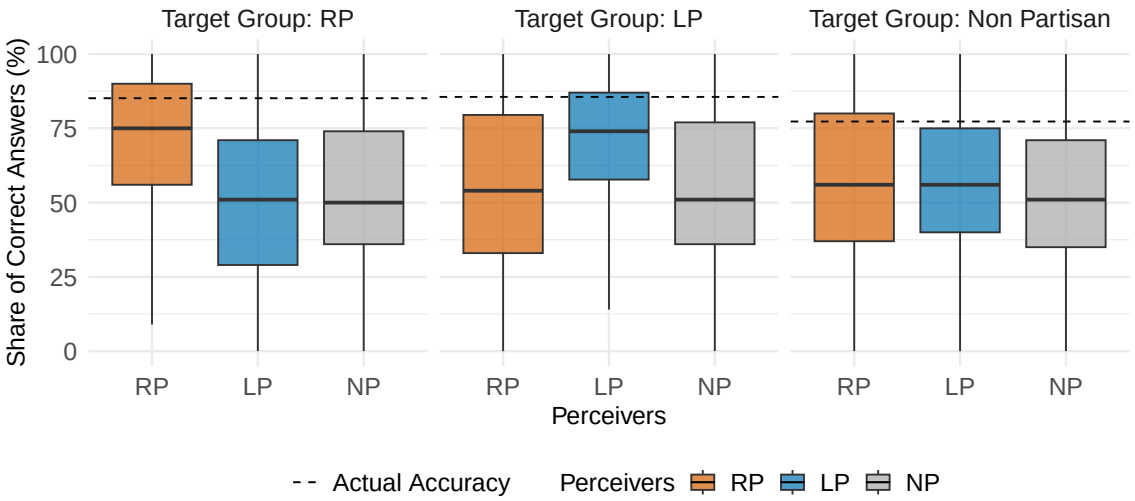
Fact 1 : The term of office of the National Assembly is 2 years.



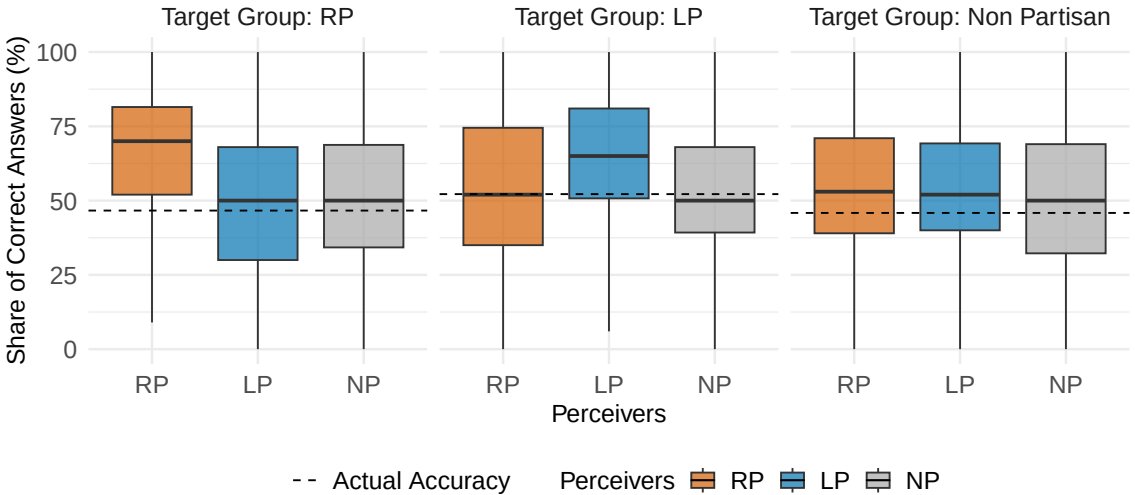
Fact 2 : To revise the constitution, more than half of pro−votes are required in a referendu



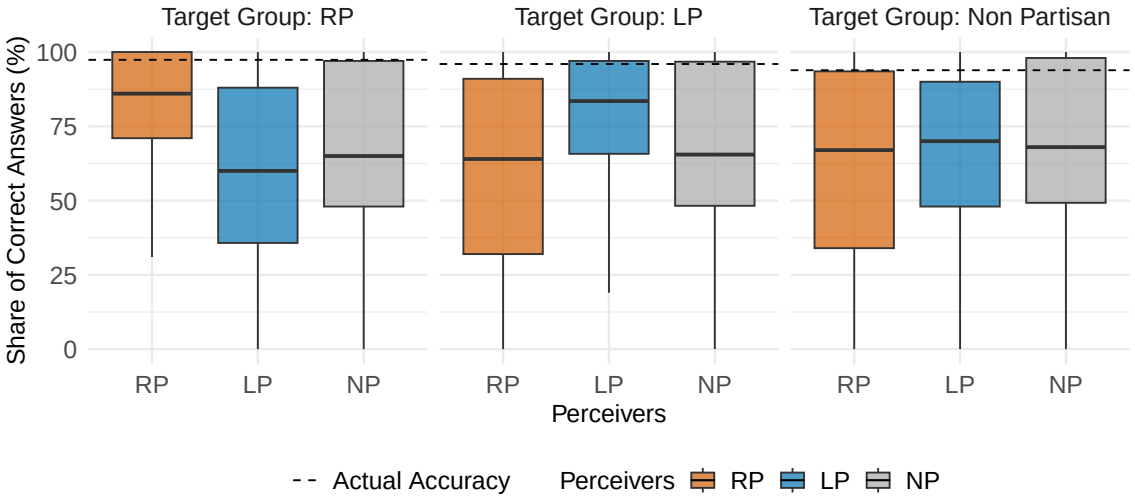
Fact 3 : The country's nominal GDP growth rate in the previous year was lower than 5%.



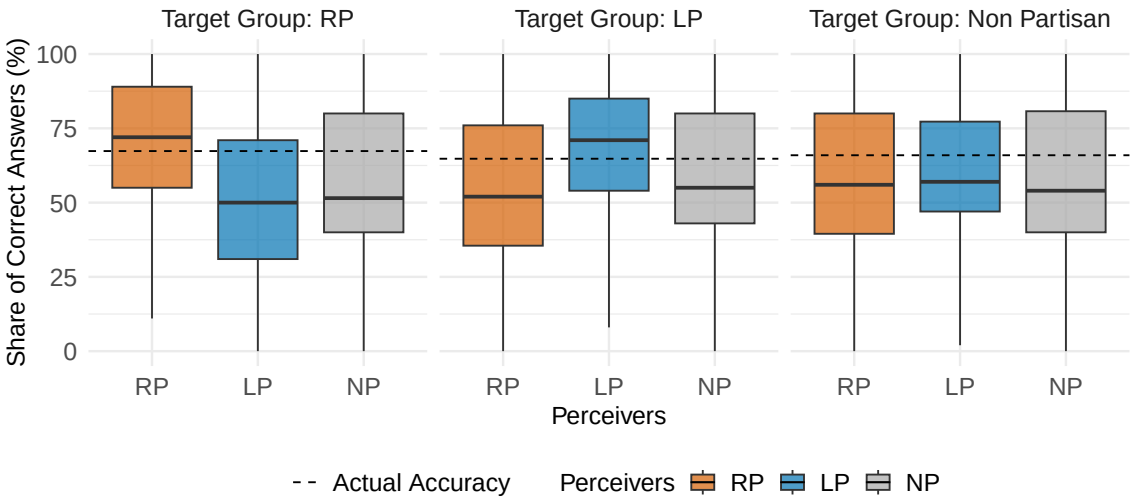
Fact 4 : For every hundred working−age people, there are forty old−age people who is 65



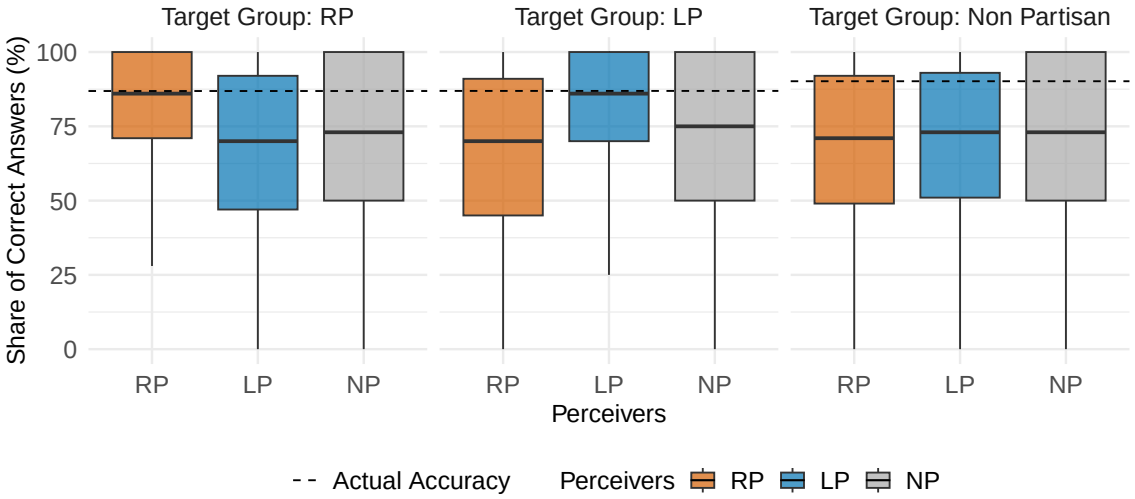
Fact 5 : New Zealand is a country located in the Middle East.



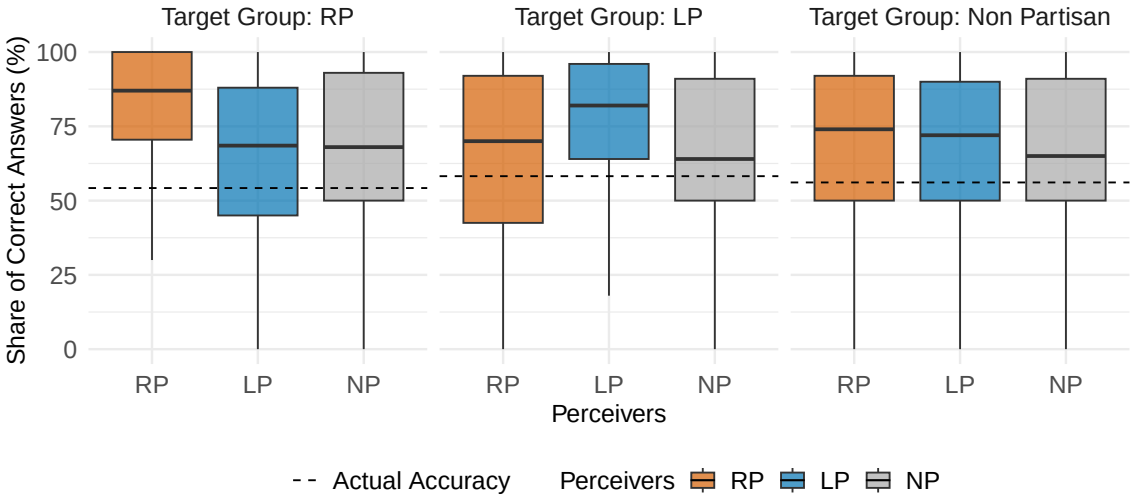
Fact 6 : iPhone was invented before 2000.



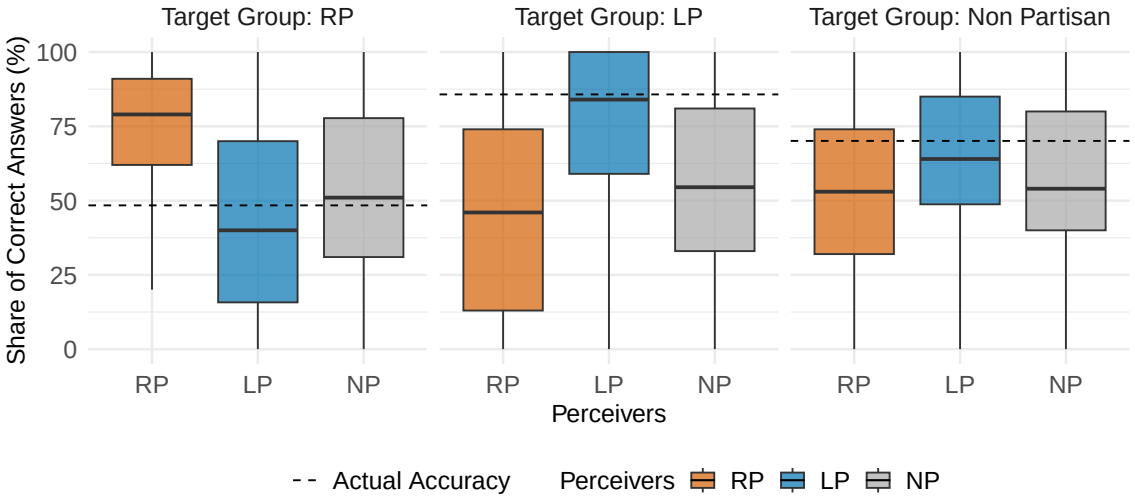
Fact 7 : It is stipulated by law that one must be at least 19 years old to drink alcohol.



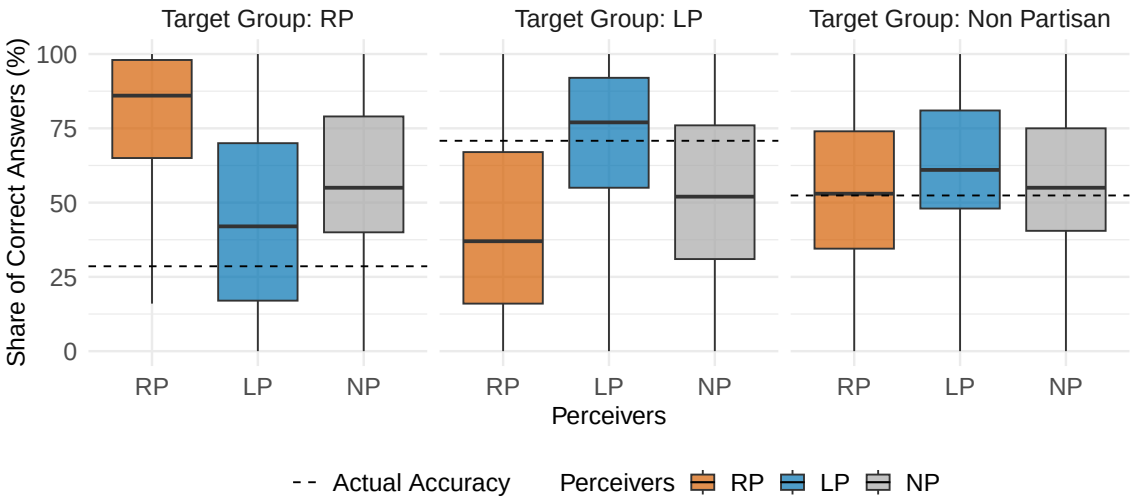
Fact 8 : The highest mountain in the country is Hallasan Mountain.



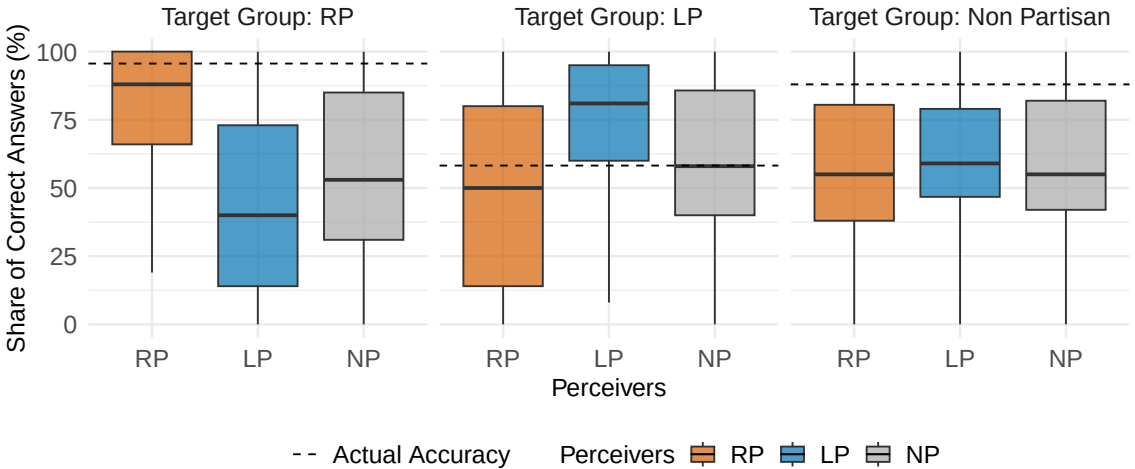
Fact 9 : There were widespread election fraud in the 2020 and 2024 elections.



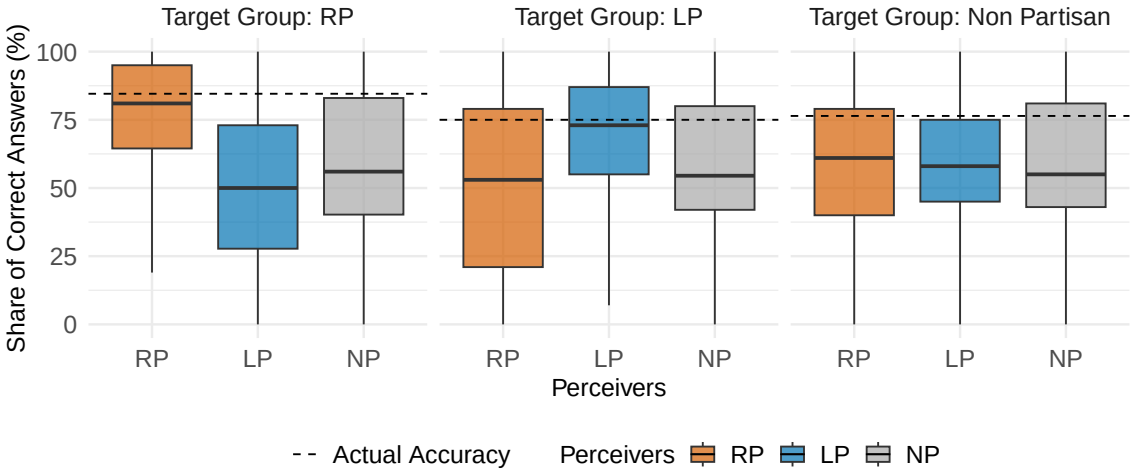
Fact 10 : China is infiltrating South Korean institutions, aiming to undermine the nation's



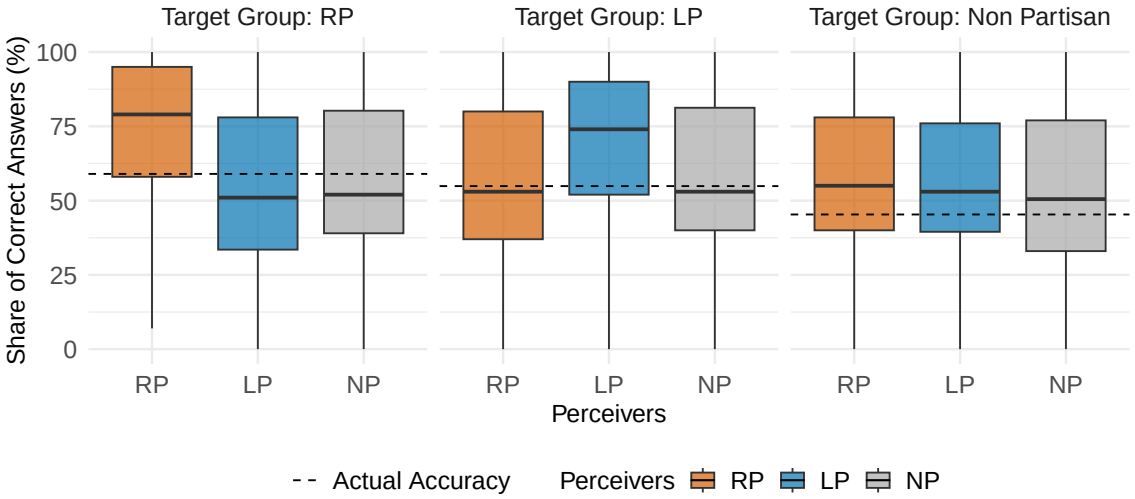
Fact 11 : The Supreme Court disqualified Lee from the presidential election in collaboration with Yoon Suk Yeol.



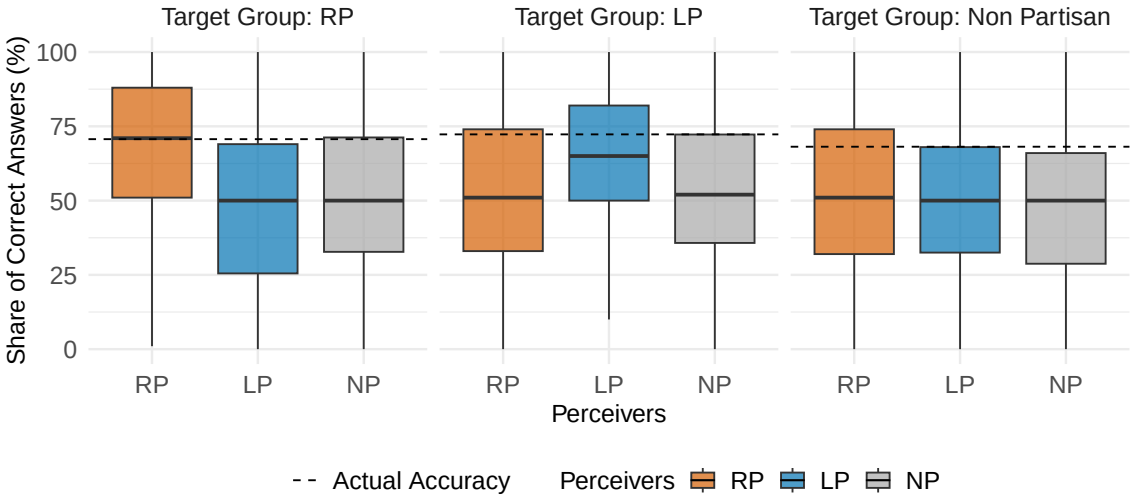
Fact 12 : U.S. government controls major political decisions in South Korea, including opposition crackdowns.



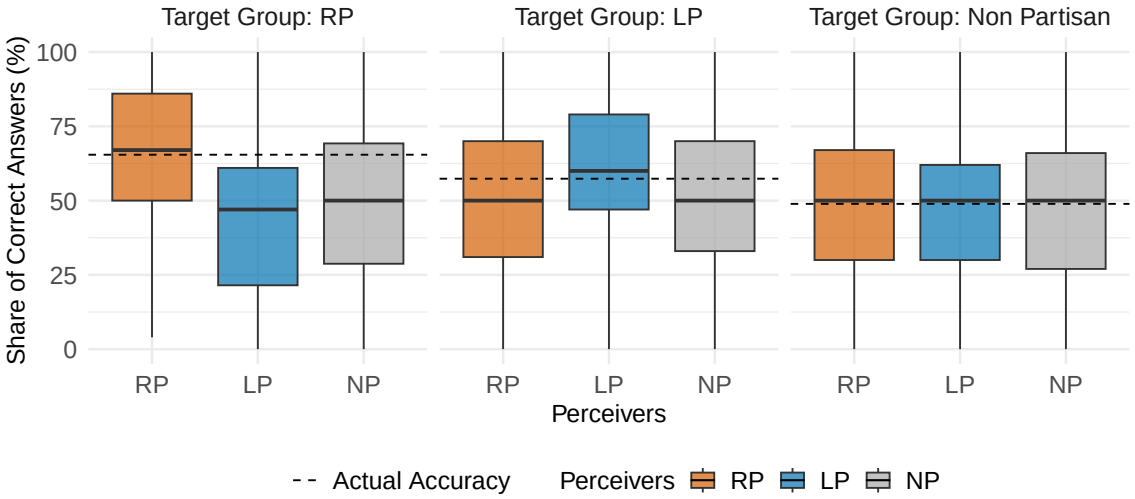
Fact 1 : The term of office of the Senate is 4 years.



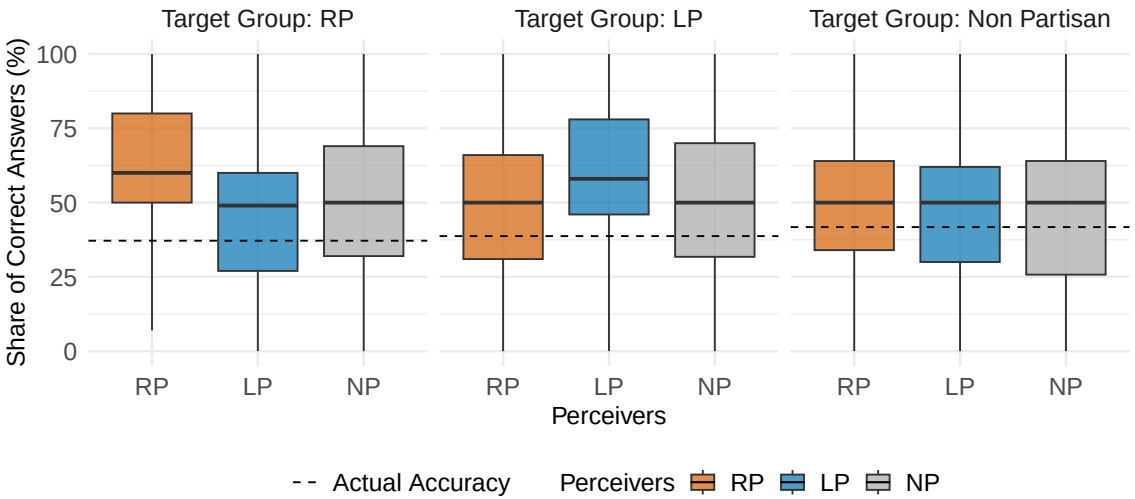
Fact 2 : To revise the Constitution, approval from more than three−fourths of the state leg



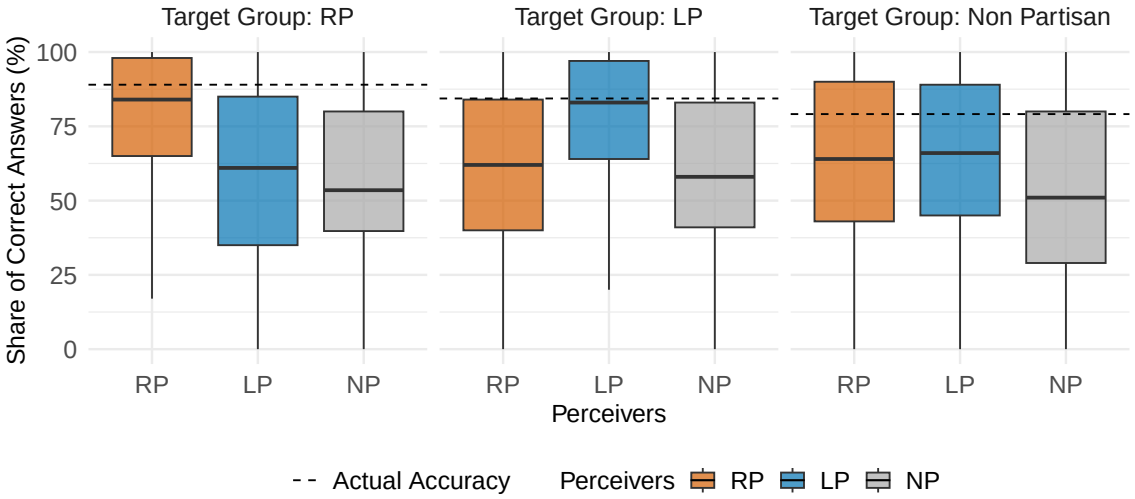
Fact 3 : The country's nominal GDP growth rate in the previous year was lower than 7%.



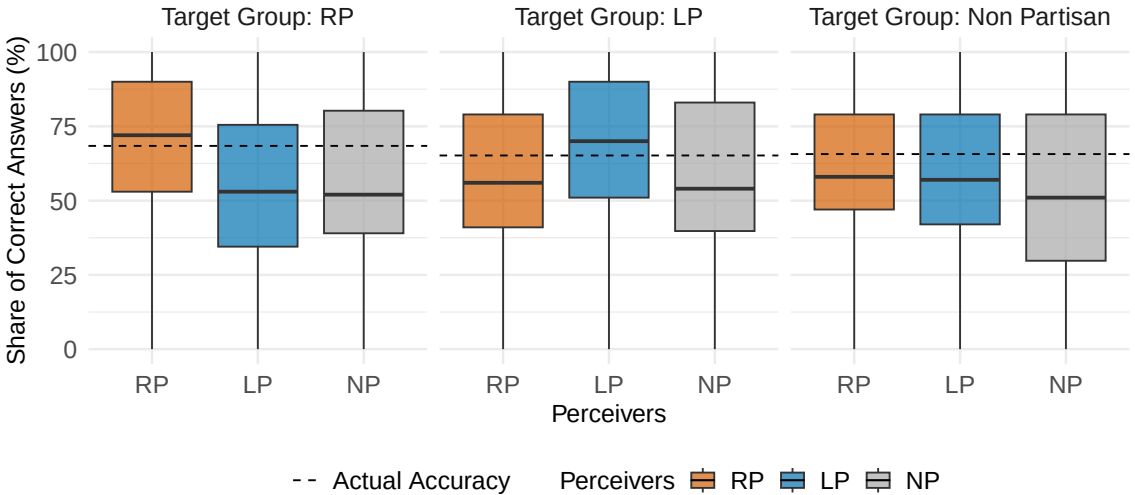
Fact 4 : For every hundred working−age people, there are forty old−age people who are 6



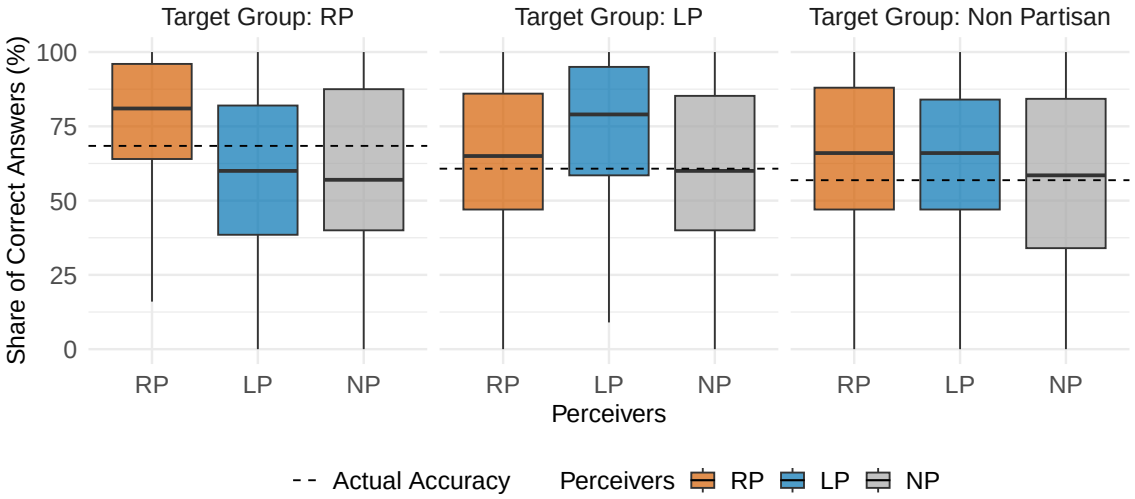
Fact 5 : New Zealand is a country located in the Middle East.



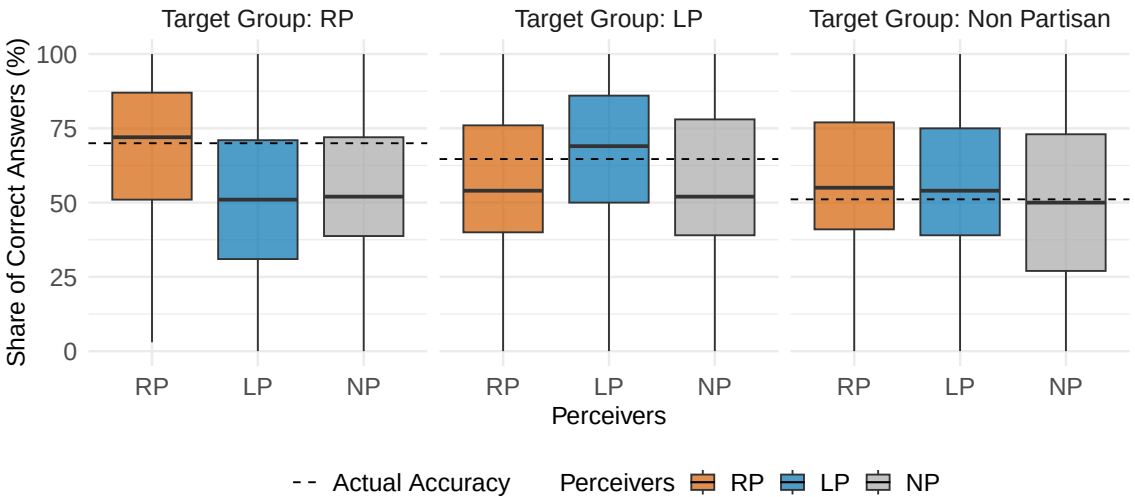
Fact 6 : iPhone was invented before 2000.



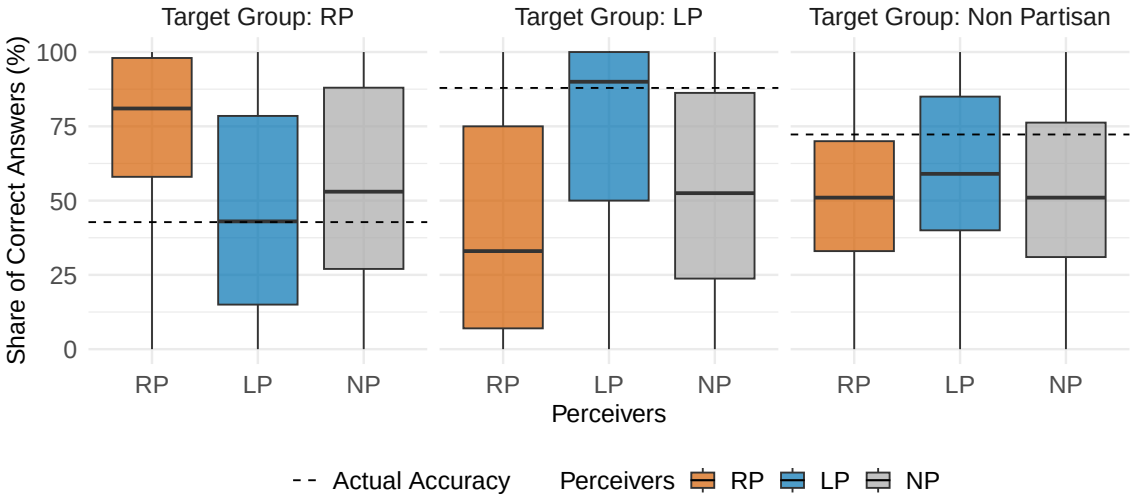
Fact 7 : The largest state in the United States is Alaska.



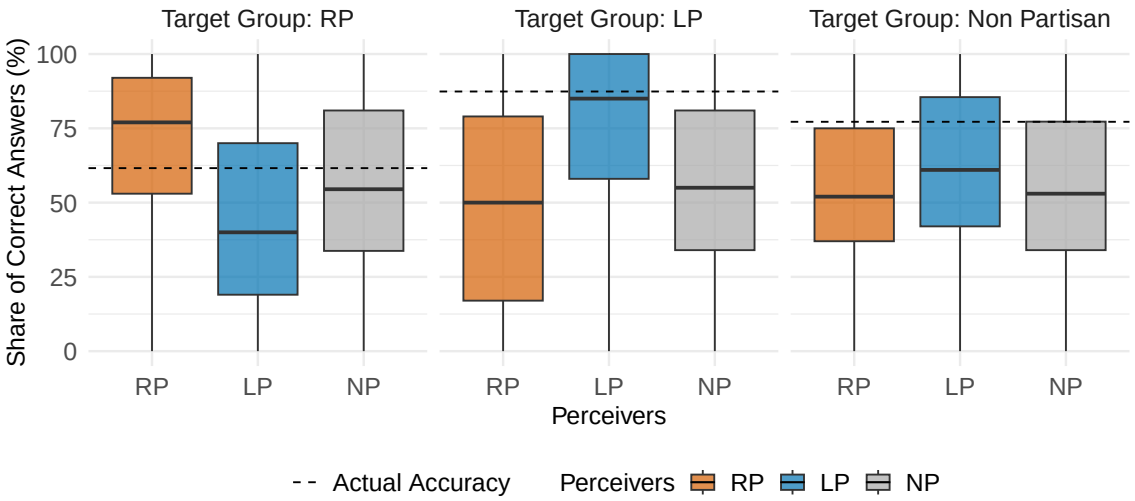
Fact 8 : The highest mountain in the United States is Denali (formerly known as Mt. McKi



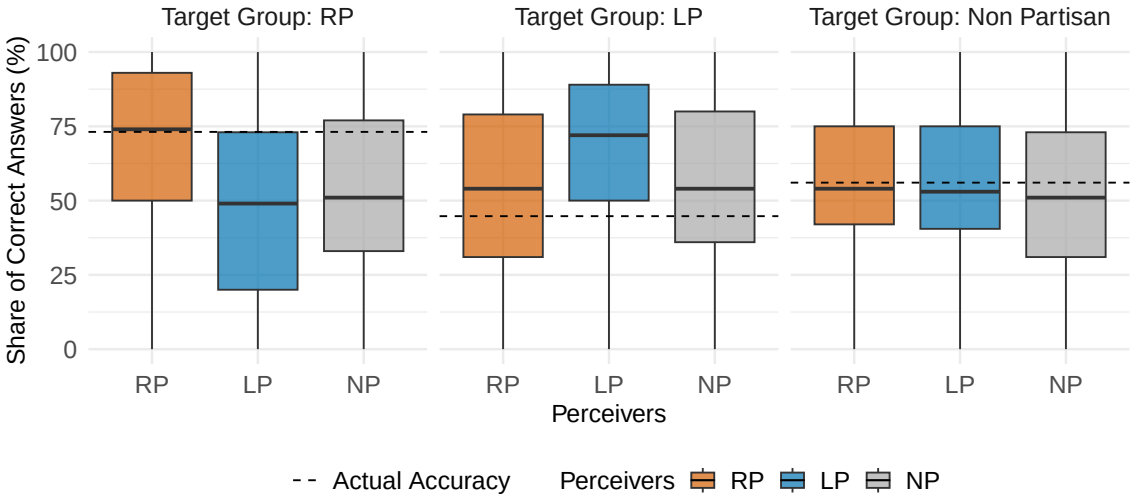
Fact 9 : The Democratic Party stole the 2020 presidential election.



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.