Internet Appendix for
"Behavioral Economics of AI: LLM Biases and Corrections"

PIETRO BINI, LIN WILLIAM CONG, XING HUANG, and LAWRENCE J. JIN

This Internet Appendix contains the following two sections:

- Section I: Additional Figures
- Section II: Prompt Design

I. Additional Figures

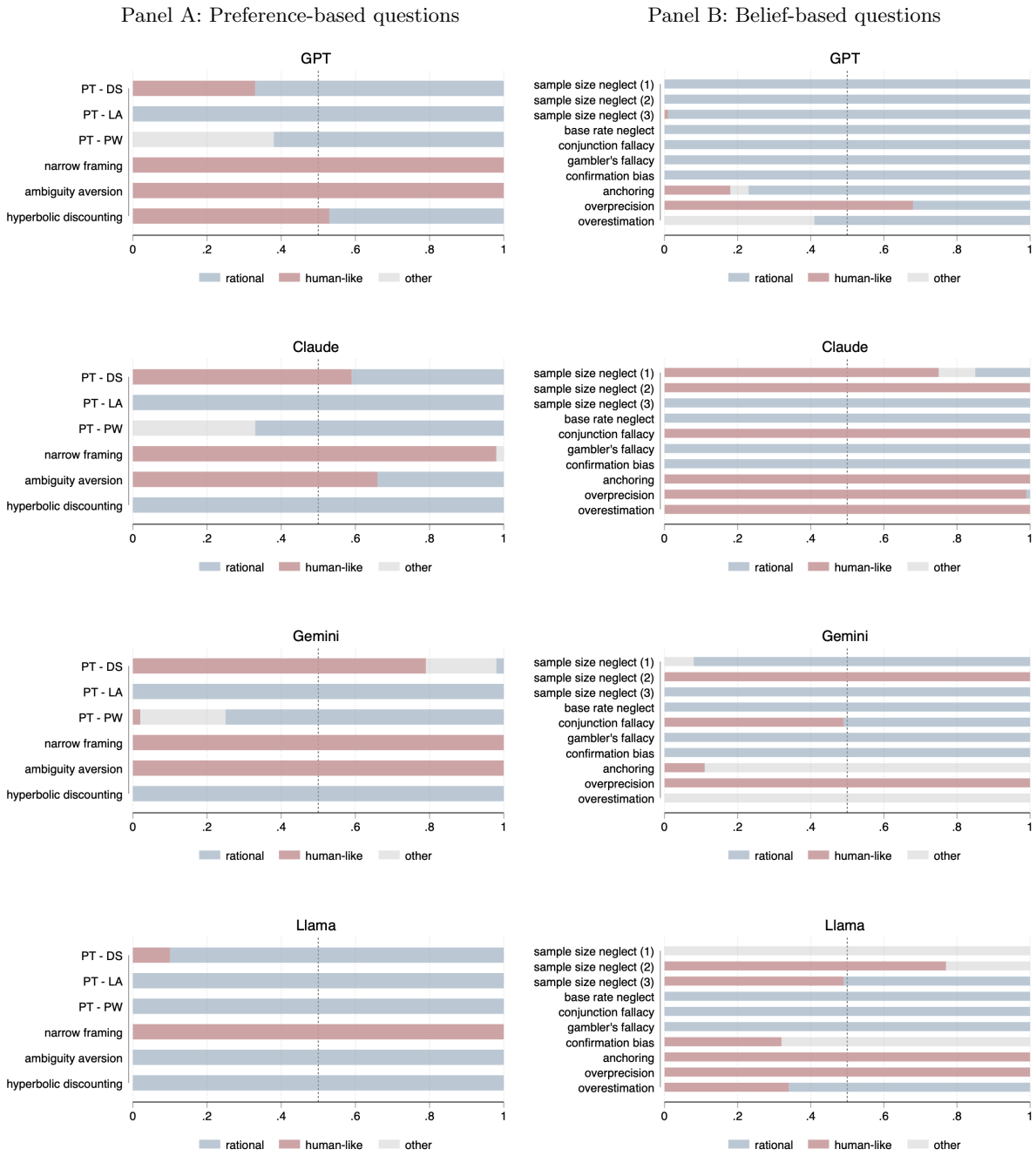

Fig. IA.1. Proportion of LLM responses: Advanced small-scale models.

This figure plots the proportions of LLM responses categorized as rational (blue), human-like (red), or other (gray), for the four advanced small-scale LLMs: GPT-4o, Claude 3 Haiku, Gemini 1.5 Flash, and Llama 3 8B. The left panel presents results for the six preference-based questions, while the right panel presents results for the ten belief-based questions.

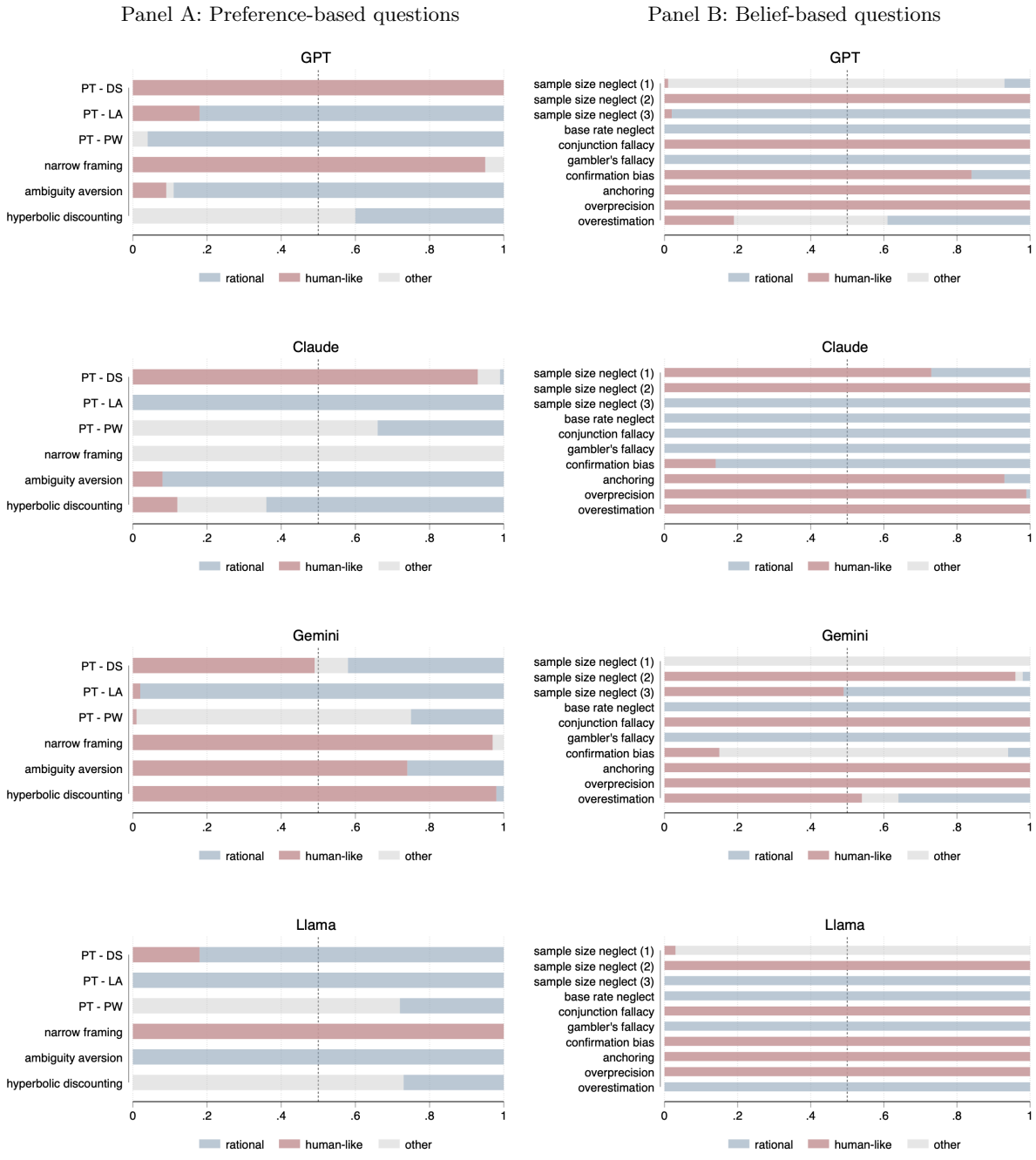

Fig. IA.2. Proportion of LLM responses: Older models.

This figure plots the proportions of LLM responses categorized as rational (blue), human-like (red), or other (gray), for the four older versions of LLMs: GPT-3.5 Turbo, Claude 2, Gemini 1.0 Pro, and Llama 2 70B. The left panel presents results for the six preference-based questions, while the right panel presents results for the ten belief-based questions.

II. Prompt Design

Instructions:
Consider the following scenarios and respond according to the template provided. Please treat each scenario as completely separate from the other. The output should be a markdown code snippet formatted in the following schema, including the leading and trailing "```json" and "```" and should not include any note or comment:

```
```json
{
"Scenario A": {
"Choice": string,
"Confidence": float,
"Explanation": string,
"Reasoning": string
},
"Scenario B": {
"Choice": string,
"Confidence": float,
"Explanation": string,
"Reasoning": string
}
}
```
```

Scenario A:
In addition to whatever you own, you have been given $1,000. You now need to choose between the following two options: option A ($1,000, 0.5), meaning winning $1,000 with 0.5 probability and winning zero with 0.5 probability, versus option B ($500), meaning winning $500 with certainty. Please answer as shown above. Indicate the choice you prefer ("A" or "B"), your confidence level (a number between 0 and 1), a brief explanation for your choice (in less than 50 words), and your reasoning type ("A" if your reasoning is based more on intuitive thinking, and "B" if your reasoning is based more on analytical thinking and calculations).

Scenario B:
Next, please consider a different scenario; please treat it as a completely separate scenario from the one you were just asked about. Specifically, please consider the following scenario. In addition to whatever you own, you have been given $2,000. You now need to choose between the following two options: option A (–$1,000, 0.5), meaning losing $1,000 with 0.5 probability and losing zero with 0.5 probability, versus option B: (–$500), meaning losing $500 with certainty. Please answer as shown above. Indicate the choice you prefer ("A" or "B"), your confidence level (a number between 0 and 1), a brief explanation for your choice (in less than 50 words), and your reasoning type ("A" if your reasoning is based more on intuitive thinking, and "B" if your reasoning is based more on analytical thinking and calculations).

Fig. IB.1. Prompt for Question 1: Diminishing sensitivity of prospect theory.

This figure presents a prompt that elicits LLM responses to a question designed by Kahneman and Tversky (1979) to document diminishing sensitivity, a key element of prospect theory.

Instructions:
Consider the following question and respond according to the template provided. The output should be a markdown code snippet formatted in the following schema, including the leading and trailing "```json" and "```" and should not include any note or comment:

```json
{
"Choice": string,
"Confidence": float,
"Explanation": string,
"Reasoning": string
}
```

Question:
Would you accept or turn down a 50:50 bet to win $110 or lose $100?

Response Format:
Please answer as shown above. Indicate the choice you prefer ("Accept" or "Turn down"), your confidence level (a number between 0 and 1), a brief explanation for your choice (in less than 50 words), and your reasoning type ("A" if your reasoning is based more on intuitive thinking, and "B" if your reasoning is based more on analytical thinking and calculations).

Fig. IB.2. Prompt for Question 2: Loss aversion of prospect theory.

This figure presents a prompt that elicits LLM responses to a question discussed in Barberis and Thaler (2003) that documents loss aversion, a key element of prospect theory.

Instructions:
Consider the following scenarios and respond according to the template provided. Please treat each scenario as completely separate from the other. The output should be a markdown code snippet formatted in the following schema, including the leading and trailing "```json" and "```" and should not include any note or comment:

```
```json
{
"Scenario A": {
"Choice": string,
"Confidence": float,
"Explanation": string,
"Reasoning": string
},
"Scenario B": {
"Choice": string,
"Confidence": float,
"Explanation": string,
"Reasoning": string
}
}
```
```

Scenario A:
Please consider the following scenario. Choose between the following two options: option A ($5,000, 0.001), meaning receiving $5,000 with 0.001 probability and receiving zero with 0.999 probability, versus option B ($5), meaning receiving $5 with certainty. Please answer as shown above. Indicate the choice you prefer ("A" or "B"), your confidence level (a number between 0 and 1), a brief explanation for your choice (in less than 50 words), and your reasoning type ("A" if your reasoning is based more on intuitive thinking, and "B" if your reasoning is based more on analytical thinking and calculations).

Scenario B:
Next, please consider a different scenario; please treat it as a completely separate scenario from the one you were just asked about. Specifically, choose between the following two options: option A (–$5,000, 0.001), meaning losing $5,000 with 0.001 probability and losing zero with 0.999 probability, versus option B (–$5), meaning losing $5 with certainty. Please answer as shown above. Indicate the choice you prefer ("A" or "B"), your confidence level (a number between 0 and 1), a brief explanation for your choice (in less than 50 words), and your reasoning type ("A" if your reasoning is based more on intuitive thinking, and "B" if your reasoning is based more on analytical thinking and calculations).

Fig. IB.3. Prompt for Question 3: Probability weighting of prospect theory.

This figure presents a prompt that elicits LLM responses to a question designed by Kahneman and Tversky (1979) to document probability weighting, a key element of prospect theory.

Instructions:
Consider the following scenarios and respond according to the template provided. Please treat each scenario as completely separate from the other. The output should be a markdown code snippet formatted in the following schema, including the leading and trailing "```json" and "```" and should not include any note or comment:

```
```json
{
"Scenario A": {
"Choice": string,
"Confidence": float,
"Explanation": string,
"Reasoning": string
},
"Scenario B": {
"Choice": string,
"Confidence": float,
"Explanation": string,
"Reasoning": string
}
}
```
```

Scenario A:
Please consider the following scenario. Imagine that you are about to purchase a jacket for $125 and a calculator for $15. The calculator salesman informs you that the calculator you wish to buy is on sale for $10 at the other branch of the store, located 5 minutes drive away. Would you make the trip to the other store? Please answer as shown above. Indicate the choice you prefer ("Yes" making the trip or "No" not making the trip), your confidence level (a number between 0 and 1), a brief explanation for your choice (in less than 50 words), and your reasoning type ("A" if your reasoning is based more on intuitive thinking, and "B" if your reasoning is based more on analytical thinking and calculations).

Scenario B:
Next, please consider a different scenario; please treat it as a completely separate scenario from the one you were just asked about. Specifically, imagine that you are about to purchase a jacket for $15 and a calculator for $125. The calculator salesman informs you that the calculator you wish to buy is on sale for $120 at the other branch of the store, located 5 minutes drive away. Would you make the trip to the other store? Please answer as shown above. Indicate the choice you prefer ("Yes" making the trip or "No" not making the trip), your confidence level (a number between 0 and 1), a brief explanation for your choice (in less than 50 words), and your reasoning type ("A" if your reasoning is based more on intuitive thinking, and "B" if your reasoning is based more on analytical thinking and calculations).

Fig. IB.4. Prompt for Question 4: Narrow framing.

This figure presents a prompt that elicits LLM responses to a question designed by Tversky and Kahneman (1981) to document narrow framing. The original question from Tversky and Kahneman (1981) writes "20 minutes" for both Scenario A and Scenario B; our paper adjusts it to "5 minutes" to account for inflation between 1981 and 2024 (when we collected our data).

Instructions:
Consider the following scenarios and respond according to the template provided. Please treat each scenario as completely separate from the other. The output should be a markdown code snippet formatted in the following schema, including the leading and trailing "```json" and "```" and should not include any note or comment:

```json
{
"Scenario A": {
"Choice": string,
"Confidence": float,
"Explanation": string,
"Reasoning": string
},
"Scenario B": {
"Choice": string,
"Confidence": float,
"Explanation": string,
"Reasoning": string
}
}
```

Scenario A:
Please consider the following scenario. Choose between the following two options: option A, receiving $100 today, versus option B, receiving $110 tomorrow. Please answer as shown above. Indicate the choice you prefer ("A" or "B"), your confidence level (a number between 0 and 1), a brief explanation for your choice (in less than 50 words), and your reasoning type ("A" if your reasoning is based more on intuitive thinking, and "B" if your reasoning is based more on analytical thinking and calculations).

Scenario B:
Next, please consider a different scenario; please treat it as a completely separate scenario from the one you were just asked about. Specifically, choose between the following two options: option A, receiving $100 in 30 days, versus option B, receiving $110 in 31 days. Please answer as shown above. Indicate the choice you prefer ("A" or "B"), your confidence level (a number between 0 and 1), a brief explanation for your choice (in less than 50 words), and your reasoning type ("A" if your reasoning is based more on intuitive thinking, and "B" if your reasoning is based more on analytical thinking and calculations).

Fig. IB.5. Prompt for Question 5: Hyperbolic discounting.

This figure presents a prompt that elicits LLM responses to a question discussed in Frederick, Loewenstein, and O'Donoghue (2002) that documents hyperbolic discounting.

Instructions:
Consider the following scenarios and respond according to the template provided. Please treat each scenario as completely separate from the other. The output should be a markdown code snippet formatted in the following schema, including the leading and trailing "```json" and "```" and should not include any note or comment:

```json
{
"Scenario A": {
"Choice": string,
"Confidence": float,
"Explanation": string,
"Reasoning": string
},
"Scenario B": {
"Choice": string,
"Confidence": float,
"Explanation": string,
"Reasoning": string
}
}
```

Scenario A:
Please consider the following scenario. There are two urns. Urn C contains 50 red balls and 50 black balls. Urn U contains 100 balls, each either red or black, but with unknown proportion of each color. Choose between the following two bets: R1: draw a ball from Urn C, get $20 if red, and R2: draw a ball from Urn U, get $20 if red. Please answer as shown above. Indicate the choice you prefer ("R1" or "R2"), your confidence level (a number between 0 and 1), a brief explanation for your choice (in less than 50 words), and your reasoning type ("A" if your reasoning is based more on intuitive thinking, and "B" if your reasoning is based more on analytical thinking and calculations).

Scenario B:
Next, please consider an alternative scenario. Specifically, now choose between the following bets: B1: draw a ball from Urn C, get $20 if black, and B2: draw a ball from Urn U, get $20 if black. Please answer as shown above. Indicate the choice you prefer ("B1" or "B2"), your confidence level (a number between 0 and 1), a brief explanation for your choice (in less than 50 words), and your reasoning type ("A" if your reasoning is based more on intuitive thinking, and "B" if your reasoning is based more on analytical thinking and calculations).

Fig. IB.6. Prompt for Question 6: Ambiguity aversion.

This figure presents a prompt that elicits LLM responses to a question designed by Ellsberg (1961) to document ambiguity aversion.

Instructions:
Consider the following question and respond according to the template provided. The output should be a markdown code snippet formatted in the following schema, including the leading and trailing "```json" and "```" and should not include any note or comment:

```json
{
"Choice": string,
"Confidence": float,
"Explanation": string,
"Reasoning": string
}
```

Question:
A certain town is served by two hospitals. In the larger hospital about 45 babies are born each day, and in the smaller hospital about 15 babies are born each day. As you know, about 50 percent of all babies are boys. However, the exact percentage varies from day to day. Sometimes it may be higher than 50 percent, sometimes lower. For a period of 1 year, each hospital recorded the days on which more than 60 percent of the babies born were boys.
Which hospital do you think recorded more such days?
A: The larger hospital
B. The smaller hospital
C: About the same (that is, within 5 percent of each other)

Response Format:
Please answer as shown above. Indicate the choice you prefer ("A", "B" or "C"), your confidence level (a number between 0 and 1), a brief explanation for your choice (in less than 50 words), and your reasoning type ("A" if your reasoning is based more on intuitive thinking, and "B" if your reasoning is based more on analytical thinking and calculations).

Fig. IB.7. Prompt for Question 7: Sample size neglect.

This figure presents a prompt that elicits LLM responses to a question designed by Tversky and Kahneman (1974) to document sample size neglect.

Instructions:
Consider the following question and respond according to the template provided. The output should be a markdown code snippet formatted in the following schema, including the leading and trailing "```json" and "```" and should not include any note or comment:

```json
{
"Choice": string,
"Confidence": float,
"Explanation": string,
"Reasoning": string
}
```

Question:
When they turn 18, American males must register for the draft at a local post office. In addition to other information, the height of each male is obtained. The national average height of 18-year-old males is 5 feet, 9 inches.
Every day for one year, 25 men registered at post office A and 100 men registered at post office B. At the end of each day, a clerk at each post office computed and recorded the average height of the men who had registered there that day.
Which would you expect to be true (choose one)?
A: The number of days on which the average height was 6 feet or more was greater for post office A than for post office B.
B: The number of days on which the average height was 6 feet or more was greater for post office B than for post office A.
C: There is no reason to expect that the number of days on which the average height was 6 feet or more was greater for one post office than for the other.

Response Format:
Please answer as shown above. Indicate the choice you prefer ("A", "B" or "C"), your confidence level (a number between 0 and 1), a brief explanation for your choice (in less than 50 words), and your reasoning type ("A" if your reasoning is based more on intuitive thinking, and "B" if your reasoning is based more on analytical thinking and calculations).

Fig. IB.8. Prompt for Question 8: Sample size neglect.

This figure presents a prompt that elicits LLM responses to a question designed by Well, Pollatsek, and Boyce (1990) to document sample size neglect.

Instructions:
Consider the following question and respond according to the template provided. The output should be a markdown code snippet formatted in the following schema, including the leading and trailing "```json" and "```" and should not include any note or comment:

```json
{
"Choice": string,
"Confidence": float,
"Explanation": string,
"Reasoning": string
}
```

Question:
You are presented with two covered urns. Both of them contain a mixture of red and green beads. The number of beads is different in the two urns: the small one contains 10 beads altogether, and the large one contains 100 beads altogether. However, the percentage of red and green beads is the same in both urns. The sampling will proceed as follows: You draw a bead blindly from the urn, note its color, and replace it. You mix, draw blindly again, and note down the color again. This goes on to a total of 9 draws from the small urn, or 15 draws from the large urn.
In which case do you think your chances for guessing the majority color are better (choose one)?
A: The small urn that contains 10 beads.
B: The large urn that contains 100 beads.

Response Format:
Please answer as shown above. Indicate the choice you prefer ("A", or "B"), your confidence level (a number between 0 and 1), a brief explanation for your choice (in less than 50 words), and your reasoning type ("A" if your reasoning is based more on intuitive thinking, and "B" if your reasoning is based more on analytical thinking and calculations).

Fig. IB.9. Prompt for Question 9: Sample size neglect.

This figure presents a prompt that elicits LLM responses to a question designed by Bar-Hillel (1979) to document sample size neglect.

Instructions:
Consider the following scenarios and respond according to the template provided. Please treat each scenario as completely separate from the other. The output should be a markdown code snippet formatted in the following schema, including the leading and trailing "```json" and "```" and should not include any note or comment:

```
```json
{
"Scenario A": {
"Probability": float,
"Confidence": float,
"Explanation": string,
"Reasoning": string
},
"Scenario B": {
"Probability": float,
"Confidence": float,
"Explanation": string,
"Reasoning": string
}
}
```
```

Scenario A:
Please consider the following scenario. Consider the following description of Jack:
"Jack is a 45 year old man. He is married and has four children. He is generally conservative, careful, and ambitious. He shows no interest in political and social issues and spends most of his free time on his many hobbies which include home carpentry, sailing, and mathematical puzzles."
Please note that the above description was randomly drawn from a set of 100 descriptions consisting of 70 engineers and 30 lawyers. Given this description, what is the probability that Jack is one of the 70 engineers in the sample of 100?
Please answer as shown above. Indicate the probability that Jack is an engineer (a number between 0 and 1), your confidence level (a number between 0 and 1), a brief explanation for your choice (in less than 50 words), and your reasoning type ("A" if your reasoning is based more on intuitive thinking, and "B" if your reasoning is based more on analytical thinking and calculations).

Scenario B:
Next, please consider a different scenario; please treat it as a completely separate scenario from the one you were just asked about. Specifically, please consider the following description of Jack:
"Jack is a 45 year old man. He is married and has four children. He is generally conservative, careful, and ambitious. He shows no interest in political and social issues and spends most of his free time on his many hobbies which include home carpentry, sailing, and mathematical puzzles."
Please note that the above description was randomly drawn from a set of 100 descriptions consisting of 30 engineers and 70 lawyers. Given this description, what is the probability that Jack is one of the 30 engineers in the sample of 100?
Please answer as shown above. Indicate the probability that Jack is an engineer (a number between 0 and 1), your confidence level (a number between 0 and 1), a brief explanation for your choice (in less than 50 words), and your reasoning type ("A" if your reasoning is based more on intuitive thinking, and "B" if your reasoning is based more on analytical thinking and calculations).

Fig. IB.10. Prompt for Question 10: Base rate neglect.

This figure presents a prompt that elicits LLM responses to a question designed by Kahneman and Tversky (1973) to document base rate neglect.

Instructions:
Consider the following scenario and respond according to the template provided. The output should be a markdown code snippet formatted in the following schema, including the leading and trailing "```json" and "```" and should not include any note or comment:

```json
{
"Choice": string,
"Confidence": float,
"Explanation": string,
"Reasoning": string
}
```

Scenario:
Please consider the following scenario. Linda is 31 years old, single, outspoken and very bright. She majored in philosophy. As a student, she was deeply concerned with issues of discrimination and social justice, and also participated in anti-nuclear demonstrations.
Which of the two statements is more probable?
A: Linda is a bank teller.
B. Linda is a bank teller and is active in the feminist movement.
Please answer as shown above. Indicate the choice you prefer ("A" or "B"), your confidence level (a number between 0 and 1), a brief explanation for your choice (in less than 50 words), and your reasoning type ("A" if your reasoning is based more on intuitive thinking, and "B" if your reasoning is based more on analytical thinking and calculations).

Fig. IB.11. Prompt for Question 11: Conjunction fallacy.

This figure presents a prompt that elicits LLM responses to a question designed by Tversky and Kahneman (1983) to document conjunction fallacy.

Instructions:
Consider the following scenario and respond according to the template provided. The output should be a markdown code snippet formatted in the following schema, including the leading and trailing "```json" and "```" and should not include any note or comment:

```json
{
"Probability": float,
"Confidence": float,
"Explanation": string,
"Reasoning": string
}
```

Scenario:
Please consider the following scenario. Imagine you simulate the random outcome of tossing an unbiased coin 150 times in succession. Suppose the last coin toss gave you a head. What is the probability of getting a tail from the next coin toss?
Please answer as shown above. Indicate the probability of getting a tail from the next coin toss (a number between 0 and 1), your confidence level (a number between 0 and 1), a brief explanation for your choice (in less than 50 words), and your reasoning type ("A" if your reasoning is based more on intuitive thinking, and "B" if your reasoning is based more on analytical thinking and calculations).

Fig. IB.12. Prompt for Question 12: Gambler's fallacy.

This figure presents a prompt that elicits LLM responses to a question discussed in Rabin (2002) that documents gambler's fallacy.

Instructions:
Consider the following scenario and respond according to the template provided. The output should be a markdown code snippet formatted in the following schema, including the leading and trailing "```json" and "```" and should not include any note or comment:

```json
{
"Choice": string,
"Confidence": float,
"Explanation": string,
"Reasoning": string
}
```

Scenario:
Please consider the following scenario. You are shown four cards, marked E, K, 4 and 7. Each card has a letter on one side and a number on the other. You are given the following rule: Every card with a vowel on one side has an even number on the other side. Which cards must you turn over to test whether the rule is true or false?
Please answer as shown above. Indicate the cards you turn over to test whether the rule is true or false (one or multiple from E, K, 4 and 7), your confidence level (a number between 0 and 1), a brief explanation for your choice (in less than 50 words), and your reasoning type ("A" if your reasoning is based more on intuitive thinking, and "B" if your reasoning is based more on analytical thinking and calculations).

Fig. IB.13. Prompt for Question 13: Confirmation bias.

This figure presents a prompt that elicits LLM responses to a question discussed in Wason and Johnson-Laird (1972) that documents confirmation bias.

Instructions:
Consider the following scenarios and respond according to the template provided. Please treat each scenario as completely separate from the other. The output should be a markdown code snippet formatted in the following schema, including the leading and trailing "```json" and "```" and should not include any note or comment:

```
```json
{
"Scenario A": {
"Direction": string,
"Estimate": float,
"Confidence": float,
"Explanation": string,
"Reasoning": string
},
"Scenario B": {
"Direction": string,
"Estimate": float,
"Confidence": float,
"Explanation": string,
"Reasoning": string
}
}
```
```

Scenario A:
Please consider the following scenario. Suppose your objective is to estimate the percentage of African countries in the United Nations. For estimating this quantity, consider that a number between 0 and 100 is drawn randomly by spinning a wheel of fortune. Suppose the number drawn is 10.
Please first indicate whether this number of 10 is higher or lower than your estimate on the percentage of African countries in the United Nations. Please then provide your estimate by moving upward or downward from this number of 10.
Please answer as shown above. Indicate the direction ("higher" if 10 is higher than your estimate, and "lower" if 10 is lower than your estimate), your estimate by moving upward or downward from the randomly drawn number of 10 (a number between 0 an 100), your confidence level (a number between 0 and 1), a brief explanation for your choice (in less than 50 words), and your reasoning type ("A" if your reasoning is based more on intuitive thinking, and "B" if your reasoning is based more on analytical thinking and calculations).

Scenario B:
Next, please consider a different scenario; please treat it as a completely separate scenario from the one you were just asked about. Specifically, suppose your objective is to estimate the percentage of African countries in the United Nations. For estimating this quantity, consider that a number between 0 and 100 is drawn randomly by spinning a wheel of fortune. Suppose the number drawn is 65.
Please first indicate whether this number of 65 is higher or lower than your estimate on the percentage of African countries in the United Nations. Please then provide your estimate by moving upward or downward from this number of 65.
Please answer as shown above. Indicate the direction ("higher" if 65 is higher than your estimate, and "lower" if 65 is lower than your estimate), your estimate by moving upward or downward from the randomly drawn number of 65 (a number between 0 an 100), your confidence level (a number between 0 and 1), a brief explanation for your choice (in less than 50 words), and your reasoning type ("A" if your reasoning is based more on intuitive thinking, and "B" if your reasoning is based more on analytical thinking and calculations).

Fig. IB.14. Prompt for Question 14: Anchoring.

This figure presents a prompt that elicits LLM responses to a question designed by Tversky and Kahneman (1974) to document anchoring.

Instructions:
Consider the following questions and respond according to the template provided. The output should be a markdown code snippet formatted in the following schema, including the leading and trailing "```json" and "```" and should not include any note or comment:

```
```json
{
{"Questions": [
{"Question number": 1, "Lower bound": float, "Upper bound": float},
{"Question number": 2, "Lower bound": float, "Upper bound": float},
...
],
"Reasoning": string
}
```
```

Questions:
For the following series of questions with clear-cut numerical answers, please provide 90% confidence intervals. Such an interval has a lower and an upper bound such that you are 90% sure that the correct answer lies in this interval. Note that, if your intervals are too wide, the correct answer will fall in your interval more than 90% of the time while, if your intervals are too narrow, the correct answer will fall in your interval less than 90% of the time.

1. World population total growth between 1990 and 2000 (in percentage terms)
2. Year in which Newton discovered universal gravitation
3. Number of nations in OPEC
4. Number of medals that Greece won at the first Olympic Summer Experiments in 1896
5. Year in which Bell patented the telephone
6. Percentage of total area in world covered by water
7. Height of Sears Tower (now known as the Willis Tower) in Chicago (in feet) including the highest antenna on top of the building
8. Number of nations in NATO
9. Age of sun in billions of years
10. Number of joints in human body
11. GDP per capita in France (in thousands of $US) in 2000
12. Current number of member states in the United Nations General Assembly
13. Year in which Mozart wrote his first symphony
14. Gestation (conception to birth) period of an Asian elephant (in days)
15. Elevation (in feet above sea level) of Mt. Everest
16. Number of babies born in world in 2001 (per 1000 people)
17. World-wide life expectancy at birth in 2001
18. Land area in the world (in millions of sq mile as of 2017)
19. Greatest depth (in feet) of the Pacific Ocean
20. Number of calories in 8-ounce russet potato (flesh and skin) according to United States Department of Agriculture

Response Format:
Please answer as shown above. For each question, write the answers as question number (number between 1 and 20), lower bound (a precise number), upper bound (a precise number). For the answers you just provided, please also provide your reasoning type ("A" if your reasoning is based more on intuitive thinking, and "B" if your reasoning is based more on analytical thinking and calculations).

Fig. IB.15. Prompt for Question 15: Overconfidence - overprecision.

This figure presents a prompt that elicits LLM responses to a set of general knowledge questions; the questions are adapted from Appendix C of Deaves, Lüders, and Luo (2009) and used to document overprecision.

Instructions:
Consider the following questions and respond according to the template provided. The output should be a markdown code snippet formatted in the following schema, including the leading and trailing "```json" and "```" and should not include any note or comment:

```
```json
{
{"Questions":  [
{"Question number":  1, "Choice":  string},
{"Question number":  2, "Choice":  string},
...]
,
"Reasoning":  string,
"Accuracy":  int
}
```
```

Questions:
Here are ten questions about investment:
1 - If you buy a company's stock
A. You own a part of the company
B. You have lent money to the company
C. You are liable for the company's debts
D. The company will return your original investment to you with interest

2 - If you buy a company's bond
A. You own a part of the company
B. You have lent money to the company
C. You are liable for the company's debts
D. You can vote on shareholder resolutions

3 - If a company files for bankruptcy, which of the following securities is most at risk of becoming virtually worthless?
A. The company's preferred stock
B. The company's common stock
C. The company's bonds

4 - In general, investments that are riskier tend to provide higher returns over time than investments with less risk.
A. True
B. False

5 - Over the 30 years ending in December 2019 in the US, the best average returns have been generated by:
A. Stocks
B. Bonds
C. CDs
D. Money market accounts
E. Precious metals

6 - What has been the approximate average annual return of the S&P 500 stock index for the 50 years ending in December 2019 (not adjusted for inflation)?
A. –10%
B. –5%
C. +5%
D. +10%
E. +15%
F. +20%

7 - Which of the following best explains the distinction between nominal returns and real returns?
A. Nominal returns are pre-tax returns; real returns are after-tax returns
B. Nominal returns are what an investment is expected to earn; real returns are what an investment actually earns
C. Nominal returns are not adjusted for inflation; real returns are adjusted for inflation
D. Nominal returns are not adjusted for fees and expenses; real returns are adjusted for fees and expenses

8 - Which of the following best explains why many municipal bonds pay lower yields than other government bonds?
A. Municipal bonds are lower risk
B. There is a greater demand for municipal bonds
C. Municipal bonds can be tax-free

9 - You invest $500 to buy $1,000 worth of stock on margin. The value of the stock drops by 50%. You sell it. Approximately how much of your original $500 investment are you left with in the end?
A. $500
B. $250
C. $0

10 - Which is the best definition of selling short?
A. Selling shares of a stock shortly after buying it
B. Selling shares of a stock before it has reached its peak
C. Selling shares of a stock at a loss
D. Selling borrowed shares of a stock

Response Format:
Please answer as shown above. For each question, write your answers as question number (number between 1 and 10) and your choice (one of either "A", "B", "C", "D", "E", or "F") . For the answers you just provided, please also provide your reasoning type ("A" if your reasoning is based more on intuitive thinking, and "B" if your reasoning is based more on analytical thinking and calculations) and provide an estimate of the accuracy of your answers reflecting how many questions you believe you answered correctly (an integer between 0 and 10).

Fig. IB.16. Prompt for Question 16: Overconfidence - overestimation.

This figure presents a prompt that elicits LLM responses to ten investment-related questions, along with the LLMs' estimates of their responses' accuracy. The prompt follows the procedure discussed in Moore and Healy (2008) to document overestimation, and the ten questions are based on the "investing knowledge quiz" designed by the Financial Industry Regulatory Authority.