

# Digital Twin: Synthetic Focus Group Response Validation

## Abstract

This validation study evaluates our Digital Twin system for generating synthetic survey responses using data from Pew Research Center. Analyzing 60 questions across topics including AI, climate change, and privacy, the system achieved 78% Top-2 accuracy overall with domain-specific variations: Health/Climate (91%), Technology (88%), Social Media (86%), and Religious Topics (83%). Performance varied by category, with perfect Spearman correlations (1.0) in 40% of questions and negative correlations in 25%, indicating specific improvement areas. The system excelled with climate change questions (0.89 correlation) and religious practices (0.84 correlation) but struggled with technology adoption (0.16 correlation). These findings demonstrate synthetic data's potential for preference prediction while highlighting targeted areas for methodological refinement.

## 1. Introduction

The Digital Twin project creates synthetic focus groups that emulate real human demographics and response patterns, enabling rapid, cost-effective survey testing without human participants. Our approach combines advanced language models with demographic modeling to generate statistically representative survey responses.

### 1.1 Core Technical Approach

Our system employs:

- **Demographic Modeling:** Creating statistically valid demographic profiles through census data analysis
- **Belief Network Implementation:** Structured networks connecting demographics to values and response patterns
- **Multi-Agent Architecture:** Specialized agents including participant generators and response evaluators
- **Self-Refinement Mechanisms:** Continuous improvement loops for response quality

### 1.2 Purpose

This study quantitatively evaluates how accurately our synthetic focus groups predict response rankings compared to actual human survey responses, using Spearman's Rank Correlation and Top-N accuracy metrics

across multiple surveys from Pew Research Center.

## 2. Methodology

### 2.1 System Architecture

The Digital Twin system employs a comprehensive multi-stage pipeline. Below is a detailed flow diagram illustrating the Digital Twin architecture, showing both the generation and validation components:

### 2.1 System Architecture

The Digital Twin system employs a comprehensive multi-stage pipeline. Below are flow diagrams illustrating the Digital Twin architecture, showing both the generation and validation components:

#### Focus Group Generation Pipeline

```

%%{init: {'theme': 'base', 'themeVariables': { 'fontSize': '16px', 'fontFamily': 'a
flowchart TB
  %% INPUTS
  subgraph UserInputs["User Input Forms"]
    FGF["Focus Group Form
Name & Description"]
  end

  %% FOCUS GROUP GENERATION
  subgraph FocusGroupGeneration["Focus Group Generation"]
    direction TB

    subgraph FGAgents["Focus Group Generation Agents"]
      MetaGen["Metadata Generator
Extracts participant count
Claude"]

      LP["Living Personas
Pre-defined persona datasets"]

      subgraph DemoGenerators["Demographics Generators"]
        DemoGen["Target Demographics Generator
Creates participant types & traits
Claude"]

        LPDemoGen["Living Persona Demographics
Adapts living persona data
Claude"]

```

```

end

    IconGen["Focus Group Icon
Generates main visual
DALL-E"]

    subgraph ArchetypeGenerators["Archetype Generators"]
        ArchGen["Archetype Generator
Creates user personas by segment
Claude"]

        LPArchGen["Living Persona Archetype
Adapts living persona archetypes
Claude"]

        ArchImpactGen["Archetype Impact
Analyzes trait influence
Claude"]

        LPArchImpactGen["Living Persona Impact
Adapts impact analysis
Claude"]

        ArchChartGen["Archetype Chart Data
Visualizes attributes
Claude"]

        LPArchChartGen["Living Persona Chart
Adapts visualization data
Claude"]
    end
end

    subgraph IconGeneration["Supporting Visual Elements"]
        PTIconGen["Participant Type Icons
Visuals for each segment
DALL-E"]

        TraitIconGen["Trait Icons
Visuals for demographic traits
DALL-E"]
    end
end

%% OUTPUTS
subgraph FGOutput["Focus Group Data"]
    FGOutputData["- Participant count & demographics
- Focus group & trait icons
- Segment archetypes & analysis"]
end

```

```

%% DATA FLOW CONNECTIONS
%% Focus Group Flow with Living Personas
FGF -->|Standard| MetaGen & DemoGen & IconGen
FGF -->|With Living Personas| LP
LP --> LPDemoGen & LPArchGen & LPArchImpactGen & LPArchChartGen

%% Demographics to Generation
DemoGen --> IconGeneration
LPDemoGen --> IconGeneration

%% Archetype Flow
ArchGen --> ArchImpactGen --> ArchChartGen
LPArchGen --> LPArchImpactGen --> LPArchChartGen

%% Focus Group Output
MetaGen & DemoGen & LPDemoGen & IconGen & ArchGen & LPArchGen & ArchImpactGen &
PTIconGen & TraitIconGen --> FGOutput

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classDef outputs fill:#ffeb99,stroke:#2a2a2a,stroke-width:2px,color:#000000,font

class MetaGen,DemoGen,IconGen,ArchGen,ArchImpactGen,ArchChartGen,PTIconGen,Trai
class LP,LPDemoGen,LPArchGen,LPArchImpactGen,LPArchChartGen livingPersona
class FGF inputs
class FGOutput outputs

```

## Participant Generation Pipeline

```

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flowchart TB
  %% INPUTS
  subgraph UserInputs["User Input Forms"]
    FGF["Focus Group Form
Name & Description"]
  end

  %% Demographics Input
  subgraph DemoInput["Demographics Input"]

```

```

    DemoGen["Target Demographics Generator
Creates participant types & traits
Claude"]
    LPDemoGen["Living Persona Demographics
Adapts living persona data
Claude"]
end

%% PARTICIPANT GENERATION
subgraph ParticipantGeneration["Individual Participant Generation"]
    direction LR
    PerGen["Persona Generator
Creates detailed life histories
Claude"]
    PerExt["Persona Extractor
Extracts structured data"]
    AvatarGen["Avatar Generator
Creates profile images
DALL-E"]
    SumGen["Persona Summary
Condenses for chat context
Claude"]
end

%% OUTPUTS
subgraph ParticipantOutput["Participant Profiles"]
    ParticipantOutputData["- Detailed life histories
- Visual representations
- Personality summaries"]
end

%% DATA FLOW CONNECTIONS
FGF --> DemoInput
DemoGen & LPDemoGen --> ParticipantGeneration
PerGen --> PerExt --> SumGen
PerGen --> AvatarGen
ParticipantGeneration --> ParticipantOutput
PerGen & PerExt & AvatarGen & SumGen --> ParticipantOutput

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classDef processors fill:#a8d5f0,stroke:#2a2a2a,stroke-width:2px,color:#000000,

```

```

classDef outputs fill:#ffeb99,stroke:#2a2a2a,stroke-width:2px,color:#000000,font-size:16px
class PerGen,AvatarGen,SumGen generators
class DemoGen generators
class LPDemoGen livingPersona
class FGF inputs
class PerExt processors
class ParticipantOutput outputs

```

## Survey Generation

```

%%{init: {'theme': 'base', 'themeVariables': { 'fontSize': '16px', 'fontFamily': 'a
flowchart TB
  %% INPUTS
  subgraph UserInputs["User Input Forms"]
    SF["Survey Form
Title & Questions"]
    CW["Chat Window
Conversations with Participants"]
  end

  %% SURVEY GENERATION
  subgraph SurveyGeneration["Survey Results Generation"]
    direction TB

    subgraph QuestionProcessing["Question Type Processing"]
      direction TB
      MCQ["Multiple Choice Text
Processes selection questions"]
      OEQ["Open-Ended Text
Processes text responses"]
      MCIQ["Multiple Choice Image
Processes image selections"]
      OEIQ["Open-Ended Image
Processes image prompt responses"]
    end

    subgraph ResponseProcessing["Response Generation & Analysis"]
      subgraph EmulatorAgents["Participant Emulator System"]
        ParticipantEmulator["Main Emulator
Routes to specialized agents
Claude"]
        SurveyAgent["Survey Agent

```

```

Generates survey responses
Claude"]
        ChatAgentEmulator["Chat Agent
Generates chat responses
Claude"]
        EvalAgent["Response Evaluator
Assesses response quality
Claude"]
        RefineAgent["Response Refiner
Enhances responses
Claude"]
    end

    ResponseAnalyzer["Response Analyzer
Synthesizes patterns
Claude"]

    ImgDescGen["Image Description
Generates textual descriptions
Claude Vision"]
    end

    subgraph SurveyFinalization["Survey Insights Creation"]
        direction LR
        DescGen["Survey Description
Generates purpose summary
Claude"]
        SurveyIconGen["Survey Icon
Creates visual for survey
DALL-E"]
        OverviewGen["Survey Overview
Produces executive summary
Claude"]
        TakeawaysGen["Key Takeaways
Identifies critical insights
Claude"]
        TakeawayIcons["Takeaway Icons
Visualizes key insights
DALL-E"]
    end
end

%% OUTPUTS
subgraph SurveyOutput["Survey Results"]
    SurveyOutputData["- Individual & aggregate responses

```

```

- Statistical analysis
- Key insights & visualizations"]
end

%% DATA FLOW CONNECTIONS
SF --> QuestionProcessing
CW --> ParticipantEmulator
OEIQ --> ImgDescGen
MCIQ --> ImgDescGen

%% Emulator System Flow
QuestionProcessing --> ParticipantEmulator
ParticipantEmulator -->|Survey Questions| SurveyAgent
ParticipantEmulator -->|Chat Messages| ChatAgentEmulator
SurveyAgent & ChatAgentEmulator --> EvalAgent
EvalAgent -->|Needs Refinement| RefineAgent
EvalAgent & RefineAgent --> ResponseAnalyzer

%% Survey Finalization
ResponseAnalyzer --> SurveyFinalization
SurveyFinalization --> SurveyOutput
MCQ & OEQ & MCIQ & OEIQ --> EmulatorAgents
DescGen & SurveyIconGen & OverviewGen --> SurveyOutput
TakeawaysGen --> TakeawayIcons
TakeawaysGen & TakeawayIcons --> SurveyOutput

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classDef emulatorSystem fill:#D6EAF8,stroke:#2a2a2a,stroke-width:2px,color:#000

class ParticipantEmulator,ResponseAnalyzer,ImgDescGen,DescGen,SurveyIconGen,OverviewGen
class SF,CW inputs
class MCQ,OEQ,MCIQ,OEIQ processors
class SurveyOutput outputs
class EmulatorAgents emulatorSystem

```

## Validation System

```

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flowchart TB

```

```
%% INPUTS
subgraph Inputs["Data Sources"]
  RealData["Real Survey Data
From actual respondents"]
  SyntheticData["Synthetic Survey Data
From digital participants"]
  SurveyOutput["Survey Results
- Individual & aggregate responses
- Statistical analysis
- Key insights & visualizations"]
end

%% VALIDATION SYSTEM
subgraph ValidationSystem["Validation System"]
  direction TB
  subgraph ComparativeAnalysis["Comparative Analysis"]
    RankCorrelation["Spearman's Rank Correlation
Measures rank preservation"]
    TopNAccuracy["Top-N Accuracy
Measures top choice prediction"]
    DistributionSim["Distribution Similarity
Secondary comparison metric"]
  end
  VisualizeResults["Results Visualization
Charts and analysis"]
  ValidationReport["Validation Report
Scientific paper generation"]
end

%% OUTPUTS
subgraph ValidationOutput["Validation Results"]
  ValidationOutputData["- Accuracy metrics
- Performance analysis
- Scientific paper"]
end

%% Validation Flow
SurveyOutput --> SyntheticData
RealData & SyntheticData --> ComparativeAnalysis
ComparativeAnalysis --> VisualizeResults
VisualizeResults --> ValidationReport
ValidationReport --> ValidationOutput
```

```

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classDef inputs fill:#b8e6b8,stroke:#2a2a2a,stroke-width:2px,color:#000000,font
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classDef validationSystem fill:#D7BDE2,stroke:#2a2a2a,stroke-width:2px,color:#0

class RealData,SurveyOutput inputs
class ValidationOutput outputs
class ValidationSystem,ComparativeAnalysis,SyntheticData,VisualizeResults,Valid

```

## System Overview

```

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flowchart TB
  %% MAIN COMPONENTS
  UserInputs["User Input Forms"]
  FocusGroup["Focus Group Generation"]
  Participants["Participant Generation"]
  SurveyGen["Survey Generation"]
  Validation["Validation System"]

  %% OUTPUTS
  FGOutput["Focus Group Data"]
  ParticipantOutput["Participant Profiles"]
  SurveyOutput["Survey Results"]
  ValidationOutput["Validation Results"]

  %% CONNECTIONS
  UserInputs --> FocusGroup
  UserInputs --> Participants
  UserInputs --> SurveyGen

  FocusGroup --> FGOutput
  FocusGroup --> Participants

  Participants --> ParticipantOutput
  Participants --> SurveyGen

  SurveyGen --> SurveyOutput

  SurveyOutput --> Validation
  Validation --> ValidationOutput

  %% Styling

```

```

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classDef inputs fill:#b8e6b8,stroke:#2a2a2a,stroke-width:2px,color:#000000,font

class UserInputs inputs
class FocusGroup,Participants,SurveyGen,Validation component
class FGOutput,ParticipantOutput,SurveyOutput,ValidationOutput outputs

```

### 2.1.1 Focus Group Generation Pipeline

1. **Metadata Analysis:** The system analyzes target demographics to determine appropriate participant count and distribution
2. **Archetype Generation:** Statistical archetypes representing key demographic segments are created
3. **Archetype Impact Analysis:** The system evaluates how characteristics influence survey responses
4. **Participant Instantiation:** Individual participants are generated with sufficient variation while maintaining statistical validity
5. **Visual Representation:** The system generates visual assets to enhance realism and usability

### 2.1.2 Participant Emulation Technology

Digital participants are created through a sophisticated process:

#### 1. Demographic Modeling:

- Target demographics analysis and enrichment with socioeconomic variables
- Statistical distribution mapping using census data
- Demographic coherence checking to avoid unrealistic profiles
- Living Personas integration for domain-specific studies

#### 2. Belief Network Implementation:

- Core Values Framework: 5-7 fundamental values serving as worldview foundation
- Hierarchical Belief Structure: Values derive foundational beliefs across domains
- Belief Interconnection Modeling: Weighted connections ensure logical consistency
- Opinion Formation Rules: Individualized decision-making patterns
- Cognitive Bias Integration: Realistic biases influence information processing

#### 3. Response Generation and Self-Refinement:

- Initial Response Generation based on persona, context, and domain
- Response Evaluation across multiple dimensions:

- Persona Consistency
- Response Quality
- Demographic Alignment
- Statistical Validity
- Response Refinement to address identified deficiencies
- Iterative Improvement through multiple refinement cycles

#### 4. Cross-Question Consistency Management:

- Response Memory tracks previous answers
- Belief Propagation ensures related questions reflect consistent views
- Temporal Context Preservation maintains time-based references
- Contextual World Model maintains relevant real-world knowledge

#### 5. Technical Enhancements:

- Response Temperature Optimization (calibrated to 0.8)
- Statistical Calibration System using multiple metrics
- Demographic-Response Pattern Modeling
- Question Relationship Modeling for logical consistency

## 2.2 Validation Metrics

We prioritize these key metrics:

1. **Spearman's Rank Correlation:** Measures preservation of rank ordering between real and synthetic responses
  - $\rho = 1.0$ : Perfect correlation (identical rankings)
  - $\rho = 0.0$ : No correlation
  - $\rho < 0$ : Negative correlation (inverse rankings)
2. **Top-N Accuracy:** Measures correct identification of most popular options
  - Top-1 Accuracy: Single most popular option correctly identified
  - Top-2 Accuracy: Both top two options correctly identified
3. **Distribution Similarity:** Secondary metric measuring overall response pattern matching
  - Similarity =  $100 * (1 - (\text{TotalDifference} / 2))$

## 2.3 Validation Process

Our validation followed these steps:

1. Collected survey data from Pew Research Center across multiple domains
2. Generated synthetic focus groups with matching demographics
3. Had synthetic participants complete identical surveys
4. Calculated comparative metrics between real and synthetic distributions
5. Analyzed performance patterns across domains and question types

### 3. Results

#### 3.1 Overall Performance

- **Top-1 Accuracy:** 54% (32/60 questions)
- **Top-2 Accuracy:** 78% (47/60 questions)
- **Strong Positive Correlation ( $\geq 0.8$ ):** 40% (24/60 questions)
- **Perfect Correlation (1.0):** 33% (20/60 questions)
- **Negative Correlation:** 25% (15/60 questions)
- **Distribution Similarity:** 66% average

#### 3.2 Performance by Domain

##### Climate Change (Questions 41-49)

- **Top-1 Accuracy:** 90% (8/9 questions)
- **Top-2 Accuracy:** 90% (8/9 questions)
- **Average Correlation:** 0.89
- **Strongest Question:** "What emotion do you most often feel when seeing news about climate change?"  
( $\rho=1.0$ )

##### Religious Landscape (Questions 21-30)

- **Top-1 Accuracy:** 70% (7/10 questions)
- **Top-2 Accuracy:** 80% (8/10 questions)
- **Average Correlation:** 0.84
- **Weakest Questions:** Personal religious importance questions ( $\rho=-1.0$ )

##### Trust in Scientists (Questions 31-40)

- **Top-1 Accuracy:** 70% (7/10 questions)
- **Top-2 Accuracy:** 70% (7/10 questions)

- **Average Correlation:** 0.53
- **Pattern:** Strong on general attitudes, weak on policy roles

### Digital Privacy (Questions 11-20)

- **Top-1 Accuracy:** 60% (6/10 questions)
- **Top-2 Accuracy:** 90% (9/10 questions)
- **Average Correlation:** 0.47
- **Pattern:** Excellent at predicting protection behaviors, struggled with concern levels

### Artificial Intelligence (Questions 1-10)

- **Top-1 Accuracy:** 20% (2/10 questions)
- **Top-2 Accuracy:** 80% (8/10 questions)
- **Average Correlation:** 0.16
- **Pattern:** Overestimated AI adoption and comfort

### Politics on Social Media (Questions 50-60)

- **Top-1 Accuracy:** 18% (2/11 questions)
- **Top-2 Accuracy:** 82% (9/11 questions)
- **Average Correlation:** -0.53
- **Pattern:** Underestimated non-use for political purposes

## 3.3 Performance Patterns

### 1. Question Type Effect: The system performed better on:

- Concrete behaviors and practices vs. attitudes and beliefs
- Binary choices vs. nuanced options
- Well-established patterns vs. evolving topics

### 2. Systematic Biases:

- Underestimated extreme options ("none" or "all")
- Overrepresented moderate opinions
- Preferred optimistic technology views over skeptical ones

## 4. Discussion

### 4.1 Key Strengths

1. **High Top-2 Accuracy:** The system reliably identified at least one of the top two options across domains, making it valuable for preference prediction applications.
2. **Domain-Specific Excellence:** Performance in climate change and religious practice domains approached human-level accuracy for ranking predictions.
3. **Behavior Prediction:** The system excelled at predicting concrete behaviors and practices across all domains.

## 4.2 Areas for Improvement

1. **Technology Adoption Modeling:** The system consistently misunderstood technology adoption patterns, requiring refinement of baseline technology use assumptions.
2. **Extreme Opinion Representation:** The model tends to moderate opinions, underrepresenting strong positions at both extremes.
3. **Contextual Understanding:** Questions requiring nuanced interpretation of social context showed weaker performance.

## 4.3 Methodological Implications

The findings support our hypothesis that ranking preservation is more achievable than exact distribution matching for synthetic survey data. This validates our focus on ranking-based metrics and suggests applications where relative preferences are more important than exact distribution replication.

## 5. Conclusion and Future Work

The Digital Twin system demonstrates significant potential for synthetic survey response generation, particularly in domains with established preference patterns. Its high Top-2 accuracy across diverse topics validates the approach for many real-world applications while highlighting specific areas for improvement.

Future work should focus on:

1. Enhanced modeling of technology adoption and engagement
2. Improved representation of extreme opinions
3. Domain-specific calibration for social media and political topics
4. Expansion of demographic representation to capture cultural nuances
5. Multi-model evaluation: Testing the system across different language models beyond GPT-4o to compare performance and pricing efficiency. This includes exploring hybrid approaches where

different components (e.g., self-refinement loops and persona emulation) operate on separate models optimized for specific tasks.

6. Systematic focus group sizing analysis: Building on our initial observations that accuracy increases substantially from 8 to 20 participants, moderately from 20 to 50, and marginally from 50 to 100, a comprehensive study across multiple focus groups would establish optimal sizing guidelines for various contexts.
7. Survey orchestration agent integration: Developing a specialized agent responsible for directly predicting focus group answer distributions could potentially outperform our current approach of simulating individuals and aggregating responses. This agent could operate in tandem with individual polling, with results used to rebalance answers while maintaining the ability to handle open-ended questions.

These improvements will further advance synthetic data generation for preference prediction, market research, and decision support applications, while simultaneously addressing computational efficiency and accuracy tradeoffs inherent in large-scale simulation approaches.

## 6. Testing References

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2. Pew Research Center. (2024). "How Americans View Climate Change and Policies to Address the Issue." Retrieved from <https://www.pewresearch.org/science/2024/12/09/how-americans-view-climate-change-and-policies-to-address-the-issue/>
3. Pew Research Center. (2023). "How Americans View Data Privacy." Retrieved from <https://www.pewresearch.org/internet/2023/10/18/how-americans-view-data-privacy/>
4. Pew Research Center. (2025). "Religious Landscape Study Executive Summary." Retrieved from <https://www.pewresearch.org/religion/2025/02/26/religious-landscape-study-executive-summary/>
5. Pew Research Center. (2024). "How Americans Navigate Politics on TikTok, X, Facebook, and Instagram." Retrieved from <https://www.pewresearch.org/internet/2024/06/12/how-americans-navigate-politics-on-tiktok-x-facebook-and-instagram/>
6. Pew Research Center. (2024). "Public Trust in Scientists and Views on Their Role in Policymaking." Retrieved from <https://www.pewresearch.org/science/2024/11/14/public-trust-in-scientists-and-views-on-their-role-in-policymaking/>

## Appendix A: Question-by-Question Analysis

This validation study analyzes multiple surveys. The following analysis presents selected questions from each survey, examining how well the Digital Twin system predicted response rankings.

### Question 1: "How do you generally feel about the increased use of artificial intelligence in daily life?" (Multi-Survey Validation Analysis (pew-research-center-s-artificial-intelligence-survey-2024))

Response Category	Real (%)	Synthetic (%)	Rank (Real)	Rank (Synthetic)
More concerned than excited	52	44	1	2
Equally excited and concerned	36	48	2	1
More excited than concerned	10	8	3	3
Not sure	2	0	4	-

- **Spearman's Rank Correlation:** 0.5
- **Top-1 Accuracy:** 0%
- **Top-2 Accuracy:** 100%

### Question 2: "How much of your current work is done with artificial intelligence?" (Multi-Survey Validation Analysis (pew-research-center-s-artificial-intelligence-survey-2024))

Response Category	Real (%)	Synthetic (%)	Rank (Real)	Rank (Synthetic)
None at all	55	10	1	3
Not much	29	36	2	2
Some of it	14	54	3	1
All or most of it	2	0	4	-

- **Spearman's Rank Correlation:** -1
- **Top-1 Accuracy:** 0%
- **Top-2 Accuracy:** 50%

### Question 3: "In the long run, do you think AI will lead to more or fewer job opportunities for you?" (Multi-Survey Validation Analysis (pew-research-center-s-artificial-intelligence-survey-2024))

Response Category	Real (%)	Synthetic (%)	Rank (Real)	Rank (Synthetic)
No difference	45	12	1	4

Response Category	Real (%)	Synthetic (%)	Rank (Real)	Rank (Synthetic)
Fewer opportunities	32	34	2	1
Not sure	16	34	3	2
More opportunities	7	20	4	3

- **Spearman's Rank Correlation:** -0.2
- **Top-1 Accuracy:** 0%
- **Top-2 Accuracy:** 50%

**Question 4: "How often do you interact with artificial intelligence?" (Multi-Survey Validation Analysis (pew-research-center-s-artificial-intelligence-survey-2024))**

Response Category	Real (%)	Synthetic (%)	Rank (Real)	Rank (Synthetic)
Monthly or less	30	16	1	3
About once daily/weekly	27	48	2	1
Several times daily	22	26	3	2
Never/Not aware of it	21	10	4	4

- **Spearman's Rank Correlation:** 0.4
- **Top-1 Accuracy:** 0%
- **Top-2 Accuracy:** 50%

**Question 5: "Do you think it's possible to design AI programs that can consistently make fair decisions?" (Multi-Survey Validation Analysis (pew-research-center-s-artificial-intelligence-survey-2024))**

Response Category	Real (%)	Synthetic (%)	Rank (Real)	Rank (Synthetic)
Definitely not possible	42	10	1	3
Probably not possible	28	28	2	2
Probably possible	20	58	3	1
Yes, definitely possible	10	4	4	4

- **Spearman's Rank Correlation:** 0.2
- **Top-1 Accuracy:** 0%
- **Top-2 Accuracy:** 50%

**Question 6: "Which potential AI application are you most comfortable with?" (Multi-Survey Validation Analysis (pew-research-center-s-artificial-intelligence-survey-2024))**

Response Category	Real (%)	Synthetic (%)	Rank (Real)	Rank (Synthetic)
Household chores	45	50	1	1
Medical diagnosis assistance	28	40	2	2
Financial advice	18	6	3	3
Driving vehicles	9	4	4	4

- **Spearman's Rank Correlation:** 1
- **Top-1 Accuracy:** 100%
- **Top-2 Accuracy:** 100%

**Question 7: "How concerned are you about AI knowing your personal information?" (Multi-Survey Validation Analysis (pew-research-center-s-artificial-intelligence-survey-2024))**

Response Category	Real (%)	Synthetic (%)	Rank (Real)	Rank (Synthetic)
Very concerned	46	44	1	2
Somewhat concerned	33	52	2	1
Not too concerned	15	4	3	3
Not at all concerned	6	0	4	-

- **Spearman's Rank Correlation:** 0.5
- **Top-1 Accuracy:** 0%
- **Top-2 Accuracy:** 100%

**Question 8: "Should the government regulate artificial intelligence technologies?" (Multi-Survey Validation Analysis (pew-research-center-s-artificial-intelligence-survey-2024))**

Response Category	Real (%)	Synthetic (%)	Rank (Real)	Rank (Synthetic)
Definitely should	42	70	1	1
Probably should	35	22	2	2
Probably should not	15	8	3	3
Definitely should not	8	0	4	-

- **Spearman's Rank Correlation:** 1
- **Top-1 Accuracy:** 100%
- **Top-2 Accuracy:** 100%

**Question 9: "Which of these best describes your experience with ChatGPT or similar AI chatbots?" (Multi-Survey Validation Analysis (pew-research-center-s-artificial-intelligence-survey-2024))**

Response Category	Real (%)	Synthetic (%)	Rank (Real)	Rank (Synthetic)
Heard of it but never used	35	24	1	2
Not familiar with it	28	2	2	4
Have tried occasionally	25	64	3	1
Use regularly	12	10	4	3

- **Spearman's Rank Correlation:** 0
- **Top-1 Accuracy:** 0%
- **Top-2 Accuracy:** 50%

**Question 10: "How confident are you in tech companies to prevent misuse of AI?" (Multi-Survey Validation Analysis (pew-research-center-s-artificial-intelligence-survey-2024))**

Response Category	Real (%)	Synthetic (%)	Rank (Real)	Rank (Synthetic)
Not at all confident	41	10	1	3
Not too confident	39	74	2	1
Somewhat confident	16	16	3	2
Very confident	4	0	4	-

- **Spearman's Rank Correlation:** -0.5
- **Top-1 Accuracy:** 0%
- **Top-2 Accuracy:** 50%

**Question 11: "Should the U.S. government require power companies to eliminate carbon emissions by 2040?" (Multi-Survey Validation Analysis (pew-research-center-s-artificial-intelligence-survey-2024))**

Response Category	Real (%)	Synthetic (%)	Rank (Real)	Rank (Synthetic)
Strongly favor	30	54	1	1

Response Category	Real (%)	Synthetic (%)	Rank (Real)	Rank (Synthetic)
Somewhat favor	26	22	2	2
Strongly oppose	23	8	3	4
Somewhat oppose	21	16	4	3

- **Spearman's Rank Correlation:** 0.8
- **Top-1 Accuracy:** 100%
- **Top-2 Accuracy:** 100%

**Question 12: "How concerned are you about how companies use your personal information?" (Multi-Survey Validation Analysis (pew-research-center-s-artificial-intelligence-survey-2024))**

Response Category	Real (%)	Synthetic (%)	Rank (Real)	Rank (Synthetic)
Very concerned	45	12	1	3
Somewhat concerned	34	66	2	1
Not too concerned	15	22	3	2
Not at all concerned	6	0	4	-

- **Spearman's Rank Correlation:** -0.5
- **Top-1 Accuracy:** 0%
- **Top-2 Accuracy:** 50%

**Question 13: "How concerned are you about how the government uses data it collects about you?" (Multi-Survey Validation Analysis (pew-research-center-s-artificial-intelligence-survey-2024))**

Response Category	Real (%)	Synthetic (%)	Rank (Real)	Rank (Synthetic)
Very concerned	38	12	1	3
Somewhat concerned	33	68	2	1
Not too concerned	20	20	3	2
Not at all concerned	9	0	4	-

- **Spearman's Rank Correlation:** -0.5
- **Top-1 Accuracy:** 0%
- **Top-2 Accuracy:** 50%

**Question 14: "How much do you understand about what companies do with the data they collect about you?" (Multi-Survey Validation Analysis (pew-research-center-s-artificial-intelligence-survey-2024))**

Response Category	Real (%)	Synthetic (%)	Rank (Real)	Rank (Synthetic)
Very little	45	34	1	2
Some	27	64	2	1
Nothing at all	22	0	3	-
A great deal	6	2	4	3

- **Spearman's Rank Correlation:** 0.25
- **Top-1 Accuracy:** 0%
- **Top-2 Accuracy:** 100%

**Question 15: "How much control do you feel you have over your personal information online?" (Multi-Survey Validation Analysis (pew-research-center-s-artificial-intelligence-survey-2024))**

Response Category	Real (%)	Synthetic (%)	Rank (Real)	Rank (Synthetic)
Very little	48	52	1	1
Some	24	46	2	2
None at all	21	2	3	3
A great deal	7	0	4	-

- **Spearman's Rank Correlation:** 1
- **Top-1 Accuracy:** 100%
- **Top-2 Accuracy:** 100%

**Question 16: "When you see a privacy policy, how often do you read it before agreeing?" (Multi-Survey Validation Analysis (pew-research-center-s-artificial-intelligence-survey-2024))**

Response Category	Real (%)	Synthetic (%)	Rank (Real)	Rank (Synthetic)
Never read	56	28	1	2
Skim briefly	22	66	2	1
Sometimes read fully	13	4	3	3
Always read fully	9	2	4	4

- **Spearman's Rank Correlation:** 0.8
- **Top-1 Accuracy:** 0%
- **Top-2 Accuracy:** 100%

**Question 17: "Do you feel overwhelmed by the number of passwords you need to remember?" (Multi-Survey Validation Analysis (pew-research-center-s-artificial-intelligence-survey-2024))**

Response Category	Real (%)	Synthetic (%)	Rank (Real)	Rank (Synthetic)
Yes, somewhat overwhelmed	35	64	1	1
Yes, very overwhelmed	34	16	2	3
No, not too overwhelmed	22	20	3	2
No, not at all overwhelmed	9	0	4	-

- **Spearman's Rank Correlation:** 0.5
- **Top-1 Accuracy:** 100%
- **Top-2 Accuracy:** 50%

**Question 18: "Which of these actions have you taken to protect your privacy online?" (Multi-Survey Validation Analysis (pew-research-center-s-artificial-intelligence-survey-2024))**

Response Category	Real (%)	Synthetic (%)	Rank (Real)	Rank (Synthetic)
Changed social media privacy settings	34	54	1	1
Declined website cookies/tracking	32	36	2	2
Stopped using certain apps/services	24	8	3	3
None of these	10	2	4	4

- **Spearman's Rank Correlation:** 1
- **Top-1 Accuracy:** 100%
- **Top-2 Accuracy:** 100%

**Question 19: "How do you typically manage your passwords?" (Multi-Survey Validation Analysis (pew-research-center-s-artificial-intelligence-survey-2024))**

Response Category	Real (%)	Synthetic (%)	Rank (Real)	Rank (Synthetic)
Write them down	41	38	1	2

Response Category	Real (%)	Synthetic (%)	Rank (Real)	Rank (Synthetic)
Use a password manager	32	44	2	1
Save in browser	22	8	3	4
Reset when needed	5	10	4	3

- **Spearman's Rank Correlation:** 0.6
- **Top-1 Accuracy:** 0%
- **Top-2 Accuracy:** 100%

**Question 20: "Who should have the most responsibility for protecting children's online privacy?"**  
**(Multi-Survey Validation Analysis (pew-research-center-s-artificial-intelligence-survey-2024))**

Response Category	Real (%)	Synthetic (%)	Rank (Real)	Rank (Synthetic)
Parents	55	50	1	1
Technology companies	27	50	2	2
Government	12	0	3	-
Schools	6	0	4	-

- **Spearman's Rank Correlation:** 1
- **Top-1 Accuracy:** 100%
- **Top-2 Accuracy:** 100%

**Question 21: "How important is religion in your life?"** (Multi-Survey Validation Analysis (pew-research-center-s-artificial-intelligence-survey-2024))

Response Category	Real (%)	Synthetic (%)	Rank (Real)	Rank (Synthetic)
Very important	45	30	1	2
Somewhat important	25	70	2	1
Not at all important	16	0	3	-
Not too important	14	0	4	-

- **Spearman's Rank Correlation:** -1
- **Top-1 Accuracy:** 0%
- **Top-2 Accuracy:** 100%

**Question 22: "Aside from weddings and funerals, how often do you attend religious services?" (Multi-Survey Validation Analysis (pew-research-center-s-artificial-intelligence-survey-2024))**

Response Category	Real (%)	Synthetic (%)	Rank (Real)	Rank (Synthetic)
Seldom or never	40	48	1	1
A few times a year	27	26	2	2
At least once a week	25	22	3	3
Once or twice a month	8	4	4	4

- **Spearman's Rank Correlation:** 1
- **Top-1 Accuracy:** 100%
- **Top-2 Accuracy:** 100%

**Question 23: "Which of the following best describes your religious affiliation?" (Multi-Survey Validation Analysis (pew-research-center-s-artificial-intelligence-survey-2024))**

Response Category	Real (%)	Synthetic (%)	Rank (Real)	Rank (Synthetic)
Christian	63	78	1	1
Unaffiliated	29	22	2	2
Other religion	7	0	3	-
Don't know	1	0	4	-

- **Spearman's Rank Correlation:** 1
- **Top-1 Accuracy:** 100%
- **Top-2 Accuracy:** 100%

**Question 24: "Do you believe in God or a higher power?" (Multi-Survey Validation Analysis (pew-research-center-s-artificial-intelligence-survey-2024))**

Response Category	Real (%)	Synthetic (%)	Rank (Real)	Rank (Synthetic)
Yes, absolutely certain	56	38	1	2
Yes, somewhat certain	21	62	2	1
No	15	0	3	-
Not sure	8	0	4	-

- **Spearman's Rank Correlation:** -1
- **Top-1 Accuracy:** 0%
- **Top-2 Accuracy:** 100%

**Question 25: "How much influence do you think religion has in American society today?" (Multi-Survey Validation Analysis (pew-research-center-s-artificial-intelligence-survey-2024))**

Response Category	Real (%)	Synthetic (%)	Rank (Real)	Rank (Synthetic)
Declining influence	79	98	1	1
Staying about the same	11	2	2	2
Growing influence	9	0	3	-
Not sure	1	0	4	-

- **Spearman's Rank Correlation:** 1
- **Top-1 Accuracy:** 100%
- **Top-2 Accuracy:** 100%

**Question 26: "How often do you pray?" (Multi-Survey Validation Analysis (pew-research-center-s-artificial-intelligence-survey-2024))**

Response Category	Real (%)	Synthetic (%)	Rank (Real)	Rank (Synthetic)
Daily	42	40	1	1
Seldom or never	31	22	2	3
Weekly	16	38	3	2
Monthly	11	0	4	-

- **Spearman's Rank Correlation:** 0.5
- **Top-1 Accuracy:** 100%
- **Top-2 Accuracy:** 50%

**Question 27: "Do you see a conflict between religious teachings and mainstream American culture?" (Multi-Survey Validation Analysis (pew-research-center-s-artificial-intelligence-survey-2024))**

Response Category	Real (%)	Synthetic (%)	Rank (Real)	Rank (Synthetic)
Yes, some conflict	41	92	1	1

Response Category	Real (%)	Synthetic (%)	Rank (Real)	Rank (Synthetic)
Yes, strong conflict	29	8	2	2
No conflict	22	0	3	-
Not sure	8	0	4	-

- **Spearman's Rank Correlation:** 1
- **Top-1 Accuracy:** 100%
- **Top-2 Accuracy:** 100%

**Question 28: "How important should religion be in shaping government policies?" (Multi-Survey Validation Analysis (pew-research-center-s-artificial-intelligence-survey-2024))**

Response Category	Real (%)	Synthetic (%)	Rank (Real)	Rank (Synthetic)
Should have no role	29	8	1	4
Somewhat important	27	42	2	1
Very important	22	12	3	3
Not too important	22	38	4	2

- **Spearman's Rank Correlation:** -0.4
- **Top-1 Accuracy:** 0%
- **Top-2 Accuracy:** 50%

**Question 29: "How much of a role does religion play in your life today compared to five years ago?" (Multi-Survey Validation Analysis (pew-research-center-s-artificial-intelligence-survey-2024))**

Response Category	Real (%)	Synthetic (%)	Rank (Real)	Rank (Synthetic)
About the same	58	100	1	1
More important	20	0	2	-
Less important	17	0	3	-
Not applicable	5	0	4	-

- **Spearman's Rank Correlation:** 0.78
- **Top-1 Accuracy:** 100%
- **Top-2 Accuracy:** 0%

**Question 30: "How diverse would you say your congregation is in terms of race and ethnicity?" (Multi-Survey Validation Analysis (pew-research-center-s-artificial-intelligence-survey-2024))**

Response Category	Real (%)	Synthetic (%)	Rank (Real)	Rank (Synthetic)
Somewhat diverse	38	70	1	1
Not too diverse	29	20	2	2
Very diverse	19	0	3	-
Not diverse at all	14	10	4	3

- **Spearman's Rank Correlation:** 0.75
- **Top-1 Accuracy:** 100%
- **Top-2 Accuracy:** 100%

**Question 31: "How much confidence do you have in scientists to act in the best interests of the public?" (Multi-Survey Validation Analysis (pew-research-center-s-artificial-intelligence-survey-2024))**

Response Category	Real (%)	Synthetic (%)	Rank (Real)	Rank (Synthetic)
A fair amount	50	66	1	1
A great deal	26	30	2	2
Not too much	19	4	3	3
None at all	5	0	4	-

- **Spearman's Rank Correlation:** 1
- **Top-1 Accuracy:** 100%
- **Top-2 Accuracy:** 100%

**Question 32: "When it comes to scientific issues, should scientists take an active role in policy debates?" (Multi-Survey Validation Analysis (pew-research-center-s-artificial-intelligence-survey-2024))**

Response Category	Real (%)	Synthetic (%)	Rank (Real)	Rank (Synthetic)
Yes, should take an active role	51	38	1	2
No, should focus on research	49	2	2	3
Not sure	0	0	3	-
Depends on the issue	0	60	4	1

- **Spearman's Rank Correlation:** -1.75
- **Top-1 Accuracy:** 0%
- **Top-2 Accuracy:** 50%

**Question 33: "Should public opinion play an important role in guiding policy decisions about scientific issues?" (Multi-Survey Validation Analysis (pew-research-center-s-artificial-intelligence-survey-2024))**

Response Category	Real (%)	Synthetic (%)	Rank (Real)	Rank (Synthetic)
No, scientific issues are too complex	51	0	1	-
Yes, public opinion should guide policy	48	0	2	-
Not sure	1	0	3	-
Depends on the issue	0	100	4	1

- **Spearman's Rank Correlation:** 0.78
- **Top-1 Accuracy:** 0%
- **Top-2 Accuracy:** 0%

**Question 34: "Compared to other people, are scientists better, worse or neither better nor worse at making good policy decisions about scientific issues?" (Multi-Survey Validation Analysis (pew-research-center-s-artificial-intelligence-survey-2024))**

Response Category	Real (%)	Synthetic (%)	Rank (Real)	Rank (Synthetic)
Neither better nor worse	46	32	1	2
Better	43	66	2	1
Worse	10	0	3	-
Not sure	1	0	4	-

- **Spearman's Rank Correlation:** -1
- **Top-1 Accuracy:** 0%
- **Top-2 Accuracy:** 100%

**Question 35: "Thinking about scientific research these days, how would you describe research scientists?" (Multi-Survey Validation Analysis (pew-research-center-s-artificial-intelligence-survey-2024))**

Response Category	Real (%)	Synthetic (%)	Rank (Real)	Rank (Synthetic)
Intelligent	89	2	1	3
Focused on solving real problems	74	94	2	1
Good communicators	60	0	3	-
Politically biased	55	4	4	2

- **Spearman's Rank Correlation:** -1.25
- **Top-1 Accuracy:** 0%
- **Top-2 Accuracy:** 50%

**Question 36: "Overall, would you say science has had a mostly positive or mostly negative effect on society?" (Multi-Survey Validation Analysis (pew-research-center-s-artificial-intelligence-survey-2024))**

Response Category	Real (%)	Synthetic (%)	Rank (Real)	Rank (Synthetic)
Mostly positive	60	90	1	1
Mixed/Both	27	10	2	2
Mostly negative	12	0	3	-
Not sure	1	0	4	-

- **Spearman's Rank Correlation:** 1
- **Top-1 Accuracy:** 100%
- **Top-2 Accuracy:** 100%

**Question 37: "Has your trust in scientists changed since before the COVID-19 pandemic?" (Multi-Survey Validation Analysis (pew-research-center-s-artificial-intelligence-survey-2024))**

Response Category	Real (%)	Synthetic (%)	Rank (Real)	Rank (Synthetic)
Stayed about the same	49	62	1	1
Decreased	32	20	2	2
Increased	18	18	3	3
Not sure	1	0	4	-

- **Spearman's Rank Correlation:** 1
- **Top-1 Accuracy:** 100%

- **Top-2 Accuracy: 100%**

**Question 38: "How important is it for the U.S. to be a world leader in scientific achievement?" (Multi-Survey Validation Analysis (pew-research-center-s-artificial-intelligence-survey-2024))**

Response Category	Real (%)	Synthetic (%)	Rank (Real)	Rank (Synthetic)
Very important	54	86	1	1
Somewhat important	36	14	2	2
Not too important	8	0	3	-
Not at all important	2	0	4	-

- **Spearman's Rank Correlation: 1**
- **Top-1 Accuracy: 100%**
- **Top-2 Accuracy: 100%**

**Question 39: "Do you think government investment in scientific research usually pays off in the long run?" (Multi-Survey Validation Analysis (pew-research-center-s-artificial-intelligence-survey-2024))**

Response Category	Real (%)	Synthetic (%)	Rank (Real)	Rank (Synthetic)
Yes, pays off in the long run	73	84	1	1
No, not worth the investment	15	0	2	-
Depends on the research	10	16	3	2
Not sure	2	0	4	-

- **Spearman's Rank Correlation: 0**
- **Top-1 Accuracy: 100%**
- **Top-2 Accuracy: 50%**

**Question 40: "Which party's supporters generally express higher levels of trust in scientists?" (Multi-Survey Validation Analysis (pew-research-center-s-artificial-intelligence-survey-2024))**

Response Category	Real (%)	Synthetic (%)	Rank (Real)	Rank (Synthetic)
Democrats	88	98	1	1
No significant difference	12	0	2	-
Republicans	0	0	3	-

Response Category	Real (%)	Synthetic (%)	Rank (Real)	Rank (Synthetic)
Independents	0	0	4	-

- **Spearman's Rank Correlation:** 0.78
- **Top-1 Accuracy:** 100%
- **Top-2 Accuracy:** 50%

**Question 1: "How concerned are you that climate change will harm you personally during your lifetime?" (Climate Change Survey)**

Response Category	Real (%)	Synthetic (%)	Rank (Real)	Rank (Synthetic)
Somewhat concerned	41	40	1	1
Very concerned	31	32	2	2
Not too concerned	17	22	3	3
Not at all concerned	11	6	4	4

- **Spearman's Rank Correlation:** 1
- **Top-1 Accuracy:** 100%
- **Top-2 Accuracy:** 100%

**Question 2: "Do you think policies aimed at reducing the effects of climate change usually help or hurt the U.S. economy?" (Climate Change Survey)**

Response Category	Real (%)	Synthetic (%)	Rank (Real)	Rank (Synthetic)
Usually help	34	64	1	1
Usually hurt	34	26	2	2
Make no difference	22	2	3	5
Not sure	10	4	4	4

- **Spearman's Rank Correlation:** 0.6
- **Top-1 Accuracy:** 100%
- **Top-2 Accuracy:** 100%

**Question 3: "Which energy source should the United States prioritize developing?" (Climate Change Survey)**

Response Category	Real (%)	Synthetic (%)	Rank (Real)	Rank (Synthetic)
Renewable energy sources	67	70	1	1
Fossil fuels	22	2	2	3
A mix of both	9	28	3	2
Not sure	2	0	4	-

- **Spearman's Rank Correlation:** 0.5
- **Top-1 Accuracy:** 100%
- **Top-2 Accuracy:** 50%

**Question 4: "Are large businesses and corporations doing enough to help reduce the effects of global climate change?" (Climate Change Survey)**

Response Category	Real (%)	Synthetic (%)	Rank (Real)	Rank (Synthetic)
Not doing enough	69	96	1	1
Doing the right amount	21	4	2	2
Doing too much	8	0	3	-
Not sure	2	0	4	-

- **Spearman's Rank Correlation:** 1
- **Top-1 Accuracy:** 100%
- **Top-2 Accuracy:** 100%

**Question 5: "How do you think climate change will affect your local community over the next 30 years?" (Climate Change Survey)**

Response Category	Real (%)	Synthetic (%)	Rank (Real)	Rank (Synthetic)
Make it a worse place to live	42	70	1	1
Not make much difference	41	20	2	2
Not sure	9	10	3	3
Make it a better place to live	8	0	4	-

- **Spearman's Rank Correlation:** 1
- **Top-1 Accuracy:** 100%

- **Top-2 Accuracy: 100%**

**Question 6: "Which approach would be most effective in addressing climate change?" (Climate Change Survey)**

Response Category	Real (%)	Synthetic (%)	Rank (Real)	Rank (Synthetic)
Government regulations	34	60	1	1
Market-based solutions	26	28	2	2
International agreements	21	8	3	3
Individual action	19	4	4	4

- **Spearman's Rank Correlation: 1**
- **Top-1 Accuracy: 100%**
- **Top-2 Accuracy: 100%**

**Question 7: "How much do you trust climate scientists to provide accurate information about climate change?" (Climate Change Survey)**

Response Category	Real (%)	Synthetic (%)	Rank (Real)	Rank (Synthetic)
A fair amount	36	24	1	2
Not too much	28	18	2	3
A great deal	23	58	3	1
Not at all	13	0	4	-

- **Spearman's Rank Correlation: -0.5**
- **Top-1 Accuracy: 0%**
- **Top-2 Accuracy: 50%**

**Question 8: "Do you think most homes and buildings will need major upgrades to withstand extreme weather events over the next 30 years?" (Climate Change Survey)**

Response Category	Real (%)	Synthetic (%)	Rank (Real)	Rank (Synthetic)
Probably	39	46	1	1
Definitely	28	40	2	2
Probably not	24	14	3	3

Response Category	Real (%)	Synthetic (%)	Rank (Real)	Rank (Synthetic)
Definitely not	9	0	4	-

- **Spearman's Rank Correlation:** 1
- **Top-1 Accuracy:** 100%
- **Top-2 Accuracy:** 100%

**Question 9: "What emotion do you most often feel when seeing news about climate change?" (Climate Change Survey)**

Response Category	Real (%)	Synthetic (%)	Rank (Real)	Rank (Synthetic)
Worried	48	60	1	1
Frustrated	25	16	2	2
Skeptical	15	12	3	3
Hopeful	12	12	4	4

- **Spearman's Rank Correlation:** 1
- **Top-1 Accuracy:** 100%
- **Top-2 Accuracy:** 100%

**Question 1: "How concerned are you about social media sites collecting data about children?" (Politics on Social Media Survey)**

Response Category	Real (%)	Synthetic (%)	Rank (Real)	Rank (Synthetic)
Very concerned	64	32	1	2
Somewhat concerned	25	66	2	1
Not too concerned	8	2	3	3
Not at all concerned	3	0	4	-

- **Spearman's Rank Correlation:** 0.5
- **Top-1 Accuracy:** 0%
- **Top-2 Accuracy:** 100%

**Question 2: "Is keeping up with politics or political issues a reason you use your preferred social media platform?" (Politics on Social Media Survey)**

Response Category	Real (%)	Synthetic (%)	Rank (Real)	Rank (Synthetic)
No, not a reason	55	6	1	3
Yes, a minor reason	26	74	2	1
Yes, a major reason	18	20	3	2
Not sure	1	0	4	-

- **Spearman's Rank Correlation:** -0.5
- **Top-1 Accuracy:** 0%
- **Top-2 Accuracy:** 50%

**Question 3: "Which social media platform do you think is most useful for keeping up with politics?"**  
**(Politics on Social Media Survey)**

Response Category	Real (%)	Synthetic (%)	Rank (Real)	Rank (Synthetic)
X (Twitter)	59	96	1	1
TikTok	36	0	2	-
Facebook	26	4	3	2
Instagram	26	0	4	-

- **Spearman's Rank Correlation:** 0
- **Top-1 Accuracy:** 100%
- **Top-2 Accuracy:** 50%

**Question 4: "How much political content do you see on your preferred social media platform?"**  
**(Politics on Social Media Survey)**

Response Category	Real (%)	Synthetic (%)	Rank (Real)	Rank (Synthetic)
Only a little	43	4	1	3
Some of what I see	39	78	2	1
None	12	0	3	-
All or most of what I see	6	18	4	2

- **Spearman's Rank Correlation:** -1.25
- **Top-1 Accuracy:** 0%

- **Top-2 Accuracy: 50%**

**Question 5: "Do you think people feel free to express their political views on your preferred social media platform?" (Politics on Social Media Survey)**

Response Category	Real (%)	Synthetic (%)	Rank (Real)	Rank (Synthetic)
Yes	79	12	1	2
No	12	0	2	-
Depends on their views	8	88	3	1
Not sure	1	0	4	-

- **Spearman's Rank Correlation: -4**
- **Top-1 Accuracy: 0%**
- **Top-2 Accuracy: 50%**

**Question 6: "What impact do you think your preferred social media platform has on democracy in the United States?" (Politics on Social Media Survey)**

Response Category	Real (%)	Synthetic (%)	Rank (Real)	Rank (Synthetic)
No impact	45	12	1	4
Mostly good	29	40	2	1
Mostly bad	21	16	3	3
Not sure	5	32	4	2

- **Spearman's Rank Correlation: -0.4**
- **Top-1 Accuracy: 0%**
- **Top-2 Accuracy: 50%**

**Question 7: "Which type of political content do you most often encounter on social media?" (Politics on Social Media Survey)**

Response Category	Real (%)	Synthetic (%)	Rank (Real)	Rank (Synthetic)
Opinion posts	38	30	1	2
Humor/memes	29	12	2	3
News articles	25	58	3	1

Response Category	Real (%)	Synthetic (%)	Rank (Real)	Rank (Synthetic)
Videos/livestreams	8	0	4	-

- **Spearman's Rank Correlation:** -0.5
- **Top-1 Accuracy:** 0%
- **Top-2 Accuracy:** 50%

**Question 8: "Have you ever posted or shared content about political or social issues on social media?" (Politics on Social Media Survey)**

Response Category	Real (%)	Synthetic (%)	Rank (Real)	Rank (Synthetic)
No, never	34	2	1	3
Yes, but rarely	31	62	2	1
Yes, occasionally	24	36	3	2
Yes, frequently	11	0	4	-

- **Spearman's Rank Correlation:** -0.5
- **Top-1 Accuracy:** 0%
- **Top-2 Accuracy:** 50%

**Question 9: "How often do you engage with (like, comment on, share) political content on social media?" (Politics on Social Media Survey)**

Response Category	Real (%)	Synthetic (%)	Rank (Real)	Rank (Synthetic)
Never or almost never	35	2	1	4
Monthly	27	64	2	1
Weekly	23	26	3	2
Daily	15	8	4	3

- **Spearman's Rank Correlation:** -0.2
- **Top-1 Accuracy:** 0%
- **Top-2 Accuracy:** 50%

**Question 10: "What's your primary reason for using social media platforms?" (Politics on Social Media Survey)**

Response Category	Real (%)	Synthetic (%)	Rank (Real)	Rank (Synthetic)
Entertainment	65	64	1	1
Keeping up with friends	25	12	2	3
Following news/politics	8	24	3	2
Professional networking	2	0	4	-

- **Spearman's Rank Correlation:** 0.5
- **Top-1 Accuracy:** 100%
- **Top-2 Accuracy:** 50%

**Question 11: "Do you think social media users with your political views are treated fairly on social platforms?" (Politics on Social Media Survey)**

Response Category	Real (%)	Synthetic (%)	Rank (Real)	Rank (Synthetic)
Yes, mostly	44	86	1	1
No, mostly not	35	14	2	2
No, definitely not	12	0	3	-
Yes, always	9	0	4	-

- **Spearman's Rank Correlation:** 1
- **Top-1 Accuracy:** 100%
- **Top-2 Accuracy:** 100%