When Can Digital Personas Reliably Approximate Human Survey Findings?

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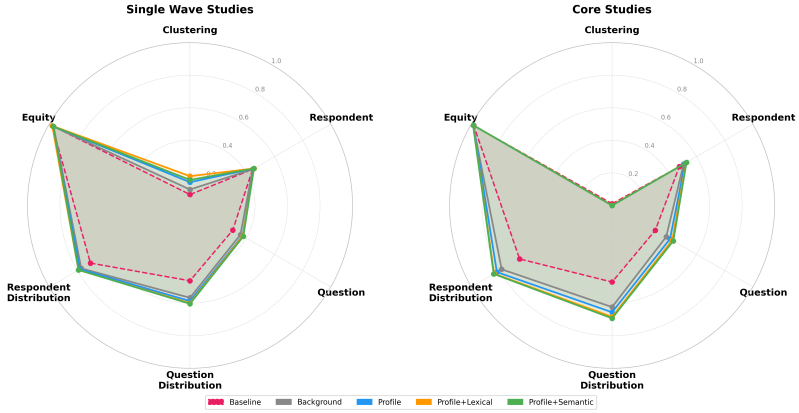
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Testing against real future answers

- **LISS panel:** Dutch households, 500 respondents per task.
- **Build personas:** background information and pre-2023 answers.
- **Evaluate:** hidden answers from the same people, 2023 onward.
- **Compare:** four persona designs, three LLMs, two prediction tasks.

All target questions have fixed answer choices.

Aggregate alignment improves, but individual fidelity remains limited



1. Personas improve distributional alignment.
2. Retrieval-based personas generally perform best.
3. Individual prediction and clustering remain limited.

When do digital personas perform well?

More reliable

- Stable attributes and values
  Family, politics, religion
- Common responses and concentrated answer distributions

Less reliable

- Subjective or situational topics
  Personality, social experiences
- Diverse responses and rare answer patterns

Human validation is especially important for the harder cases.

Take-home message

- Personas can support **early survey design** and exploration of **aggregate patterns**.
- Individual prediction and respondent clustering remain limited.
- **Human validation remains essential.**