Eliciting Personal Values through Isolation Questioning: A Graphical Interface Approach

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1. Background

- Behavioral support agents are systems designed to assist individuals in their day-to-day lives by providing assistance on various activities **(Kola et al., 2020)**.

- A personalized and effective user experience is dependent on updating user models in real-time. As part of achieving this, AI systems need to comprehend a user's current priorities, situation, and the impact of contextual factors on their behavior **(Tielman et al., 2018)**.

- The concept of a personal value can be defined as a belief or principle that a person holds as being important or desirable **(Schwartz, 1992)**.

2. Research Question

"How accurate is a graphical interface that uses questions in isolation, in eliciting personal values?"

3. Misalignment Scenarios

In order to accurately reflect the user's values, **misalignment scenarios** have been created in which a certain context leads to model updates.
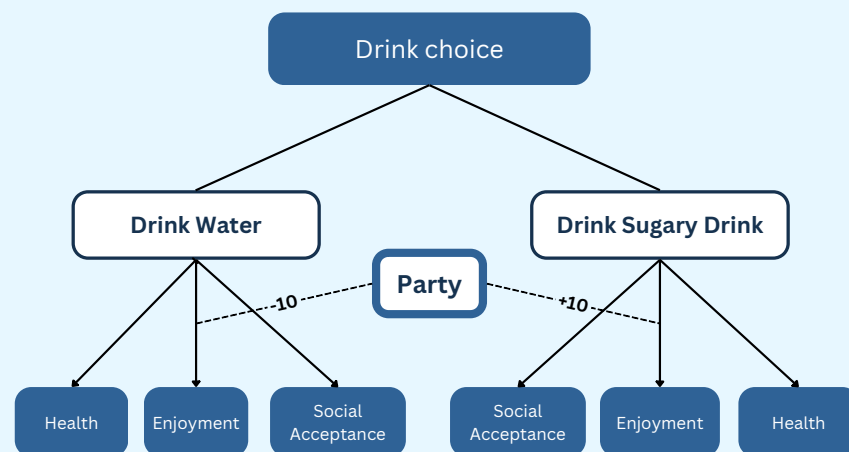

Figure 1: Misalignment scenario for choosing a beverage at a party.

4. Methodology

1. Literature Review & Misalignment Scenario
2. Experiment Set-up
3. Design of the Graphical Interface
4. Conduction of the Experiment
5. Data Analysis

5. Graphical Interface

The graphical Interface is designed as an interactive prototype in Figma. This interface elicits the user's personal values using **questions in isolation**. These questions are are asked independently of other questions, without any connection or relationship to each other.
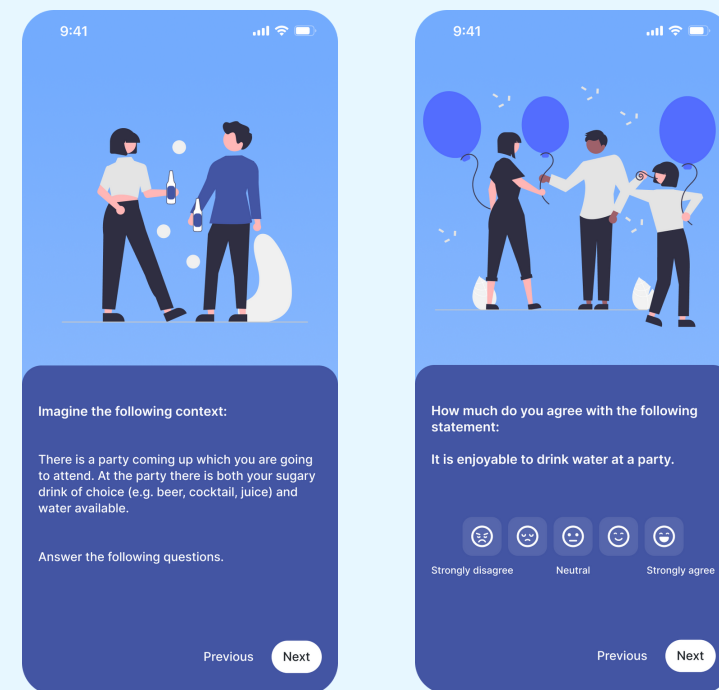

Figure 2: Graphical Interface representing the context of attending a party.

6. Experiment

Participants
A group of 15 participants diverse in age (18-65) and gender

Procedure
Instructions and signing of the consent form
Interaction of the user with the graphical interface
User modelling based on the answers with Python script
The participant provided corrections to the model (if necessary)
System Usability Score (SUS) questionnaire

Additional experiment
Comparison between different interfaces in research group
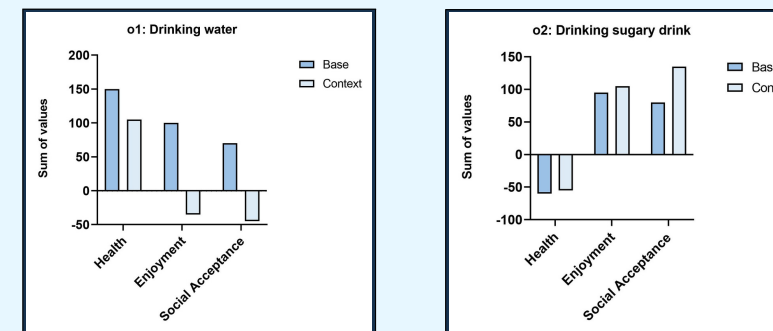Graphical / Audio/ Textual & Comparison / Isolation questions

7. Results

Figure 3: Aggregated responses from the experiments for scenario 1.

Table 1: Basic statistics hamming distance

Sample Size	Mean	Median	Standard Deviation
15	1.333	0	2.193

Table 2: Basic statistics value difference

Sample Size	Mean	Median	Standard Deviation
15	8	0	13.065

Table 3: Comparison between interfaces, a/b indicates the average magnitude of a participant's correction. Here, "a" represents a user's sum of the value differences and "b" represents the number of changes in all behaviors (hamming distance).

Participant	G+I	G+C	T+I	T+C	A+I
1	x	7/2	40/8	10/2	0
2	25/5	x	25/4	110/10	5/1
3	0	45/9	x	70/10	0/0
4	20/4	75/8	40/5	x	5/1
5	25/5	75/13	55/9	30/5	x
Mean	3.75	5.911	6.340	7.25	2.5

8. Insights

The experiment indicates that participants tend to prioritize different personal values when certain situations occur.

Some participants emphasize long-term values over short-term values.

Need for broader and more specific **choice options**.

Users tend to **overread** some questions without fully comprehending what the question asks for.

Interfaces with isolation questioning generally performed **better** than interfaces with comparison questioning. In addition, audio and graphic interface types outperformed textual-based interfaces.

9. Limitations

Relatively few participants recruited, resulting in **limited statistical significance** and generalizability.

Confounding factors such as fatigue, mood, and time of day.

Biased responses due to the monitoring process.

The inherent differences between textual, graphical, and audio interfaces makes it difficult to establish **objective** measures for comparison.

10. Future Prospects

Longitudinal studies

Empower users and engage them in the elicitation process

Using **different technologies** for interface implementation and user modelling

Increasing the **study's objectivity** (larger sample size, improve **consistency** and comparability of evaluation measures, etc.)

References

[1] Kola, I., Jonker, C.M., van Riemsdijk, M.B. (2020). Who's That? - Social Situation Awareness for Behaviour Support Agents. In: Dennis, L., Bordini, R., Lespérance, Y. (eds) Engineering Multi-Agent Systems. EMAS 2019. Lecture Notes in Computer Science(), vol 12058. Springer, Cham.

[2] Tielman, M. L., Jonker, C. M., & van Riemsdijk, M. B. (2018, July). What Should I Do? Deriving Norms from Actions, Values and Context. @ IJCAI (pp. 35-40).

[3] Schwartz, S. H. (1992). Universals in the content and structure of values: Theory and empirical tests in 20 countries. In M. Zanna (Ed.), Advances in experimental social psychology (Vol. 25, pp. 1-65). New York: Academic Press.