

# LLM-Based Persona Simulation to Support Testing of a Storytelling Robot for People with Dementia

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## 1. Introduction

- Story-making applications could help improve the lives of People with Dementia (PwD).
- Robots may have the potential to conduct such activities effectively.
- Testing such systems using real people can be hard, complicated, and privacy-intrusive.
- Persona-based testing can be an effective alternative to user testing.
- Large Language Models (LLMs) have been very effective in simulating artificial user profiles (personas).

## 2. Research Question

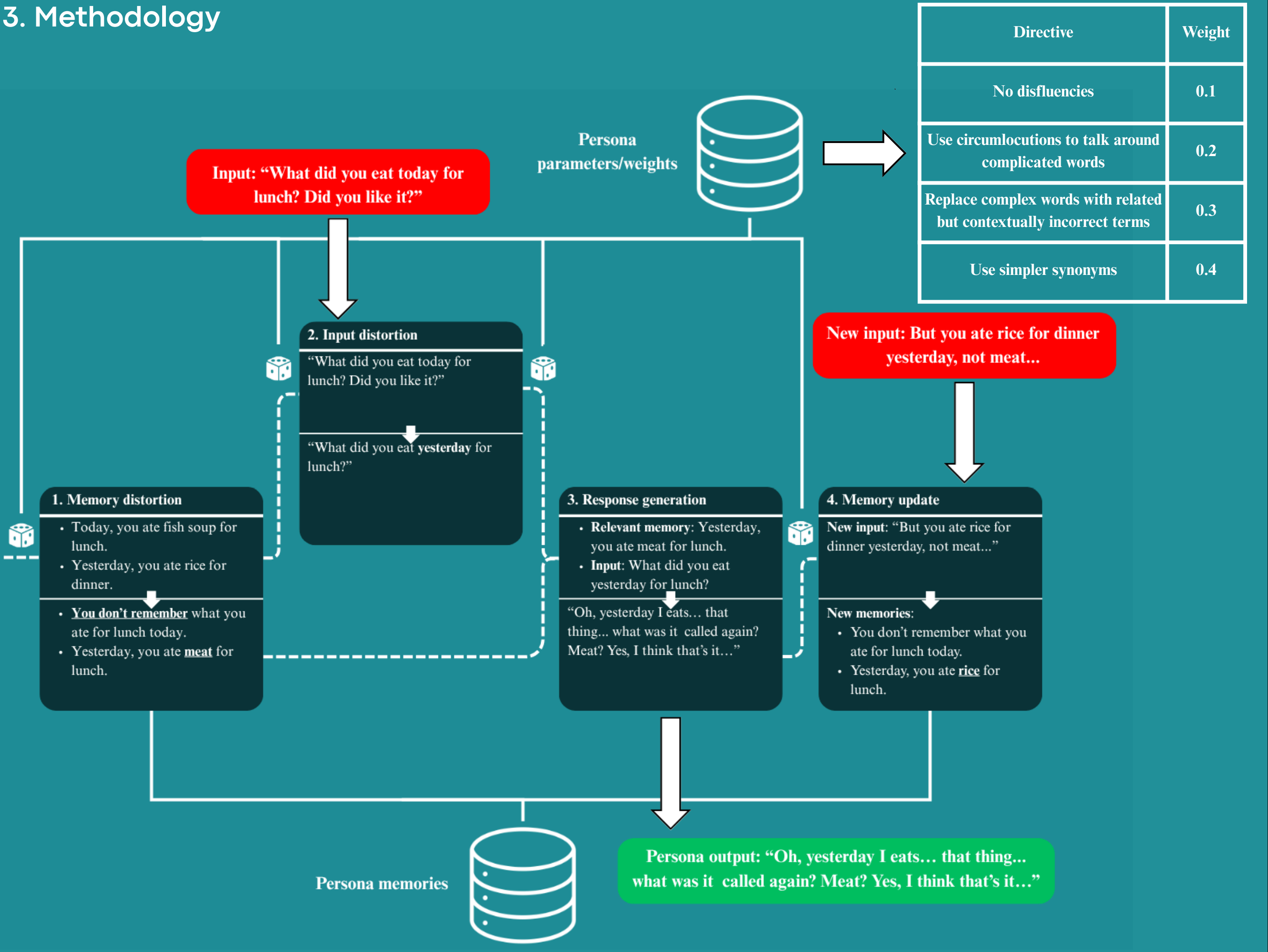
Can pre-trained LLMs effectively simulate accurate personas of PwD, providing a foundation for applications such as testing a storytelling robot designed for them?

## 4. Results/Conclusions

Pre-trained LLMs possess the capability to simulate accurate personas of PwD to a significant extent:

- Persona outputs reflect a wide range of dementia symptoms.
- Early-stage Alzheimer’s (AD) and vascular dementia (VaD) personas show statistical similarity to real PwD based on MMSE scores.
- MMSE analysis indicates personas realistically model:
  - Impaired recent compared to distant memory (Early-stage AD)
  - Preserved memory, reduced executive function (VaD)
  - Global cognitive impairment (Late-stage AD)

## 3. Methodology



## 5. Future work

- Experiment with fine-tuning techniques to enhance persona accuracy.
- Integrate a system for personas to self-report their own enjoyability and engagement levels during the activity.
- Conduct deeper evaluations of personas, focusing on their effectiveness as testing tools.

