

Voice Interaction With Conversational AI Could Facilitate Thoughtful Reflection and Substantive Revision in Writing

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Motivation

- Revising writing to meet audience expectations requires reflection.
- Traditional static feedback is limited; lacks the dialogue necessary for meaningful reflection.
- Conversational AI (powered by LLMs) could replicate the benefits of writing center-style dialogue, especially through voice interaction.

Research Questions

- **RQ1:** How might speaking to LLM-powered conversational agents, compared to typing, influence the depth and kinds of concerns writers reflect on in their work?
- **RQ2:** How does engaging in spoken conversations with LLM-powered conversational agents, as opposed to text-based interactions, shape the way writers refine and revisit their own reflections?
- **RQ3:** How do writers perceive the cognitive demands of speaking to LLM-powered conversational agents, compared to typing, and what factors influence these perceptions?
- **RQ4:** How does reflecting with LLM-powered conversational agents influence the extent and depth of revisions in written content?

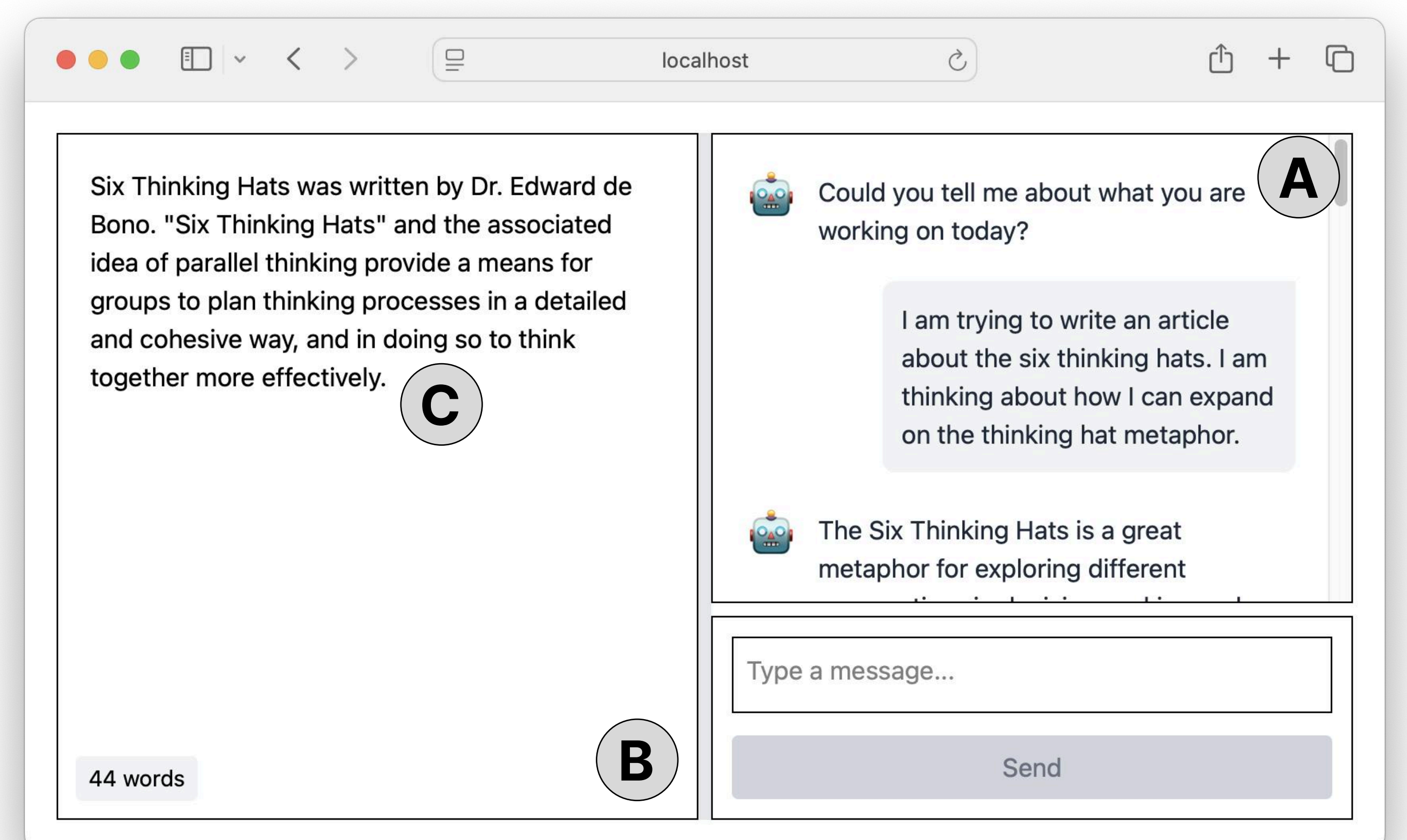
Methodology

- **Experiment Design:** Within-subjects study (voice vs. text input).
- **Participants:** Recruited from first author's university and crowdsourcing platforms.
- **Task:** Reflect and revise two argumentative essay drafts using conversational AI.
- **Measures:**
 - NASA-TLX for cognitive load.
 - Engagement metrics (turns per minute, response time).
 - Frequency/proportion of higher-order concerns reflected (using a rubric).
 - Revision quality (using a rubric).
 - Post-study logged interaction interview.

Experiment System Design

The design is inspired by writing center interactions and incorporates three key elements:

- **Initiation (A):** The system initiates the interaction by providing prompts or conversation starters, similar to how writing tutors begin a session.
- **Contextualization (B):** A separate document space is provided to help users maintain awareness of their writing context.
- **Control (C):** Users retain full editing control over their content, deciding whether and how to revise their work without direct AI input.



Hypotheses

- **H1:** Greater engagement with higher-order concerns in writing (e.g., thesis, audience, organization).
- **H2:** Increased iterative refinement of reflections.
- **H3:** Reduced cognitive load during the reflection process.
- **H4:** More substantive revisions in written content.

Expected Contributions

- Insight into how modality affects reflection with AI.
- Design implications for intelligent writing tools.
- Framework for transforming static LLM feedback into dynamic, voice-based conversation.



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2246145