

Too Distracted to Think Straight?

How Does External Cognitive Load Affect Young Adults' Ability to Evaluate AI-Generated Content?

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1. Introduction

- Around **64%** of young adults in Europe use generative AI [1].
- Around **78%** of adolescents claim to multitask often [2].
- Previous work shows that divided attention can impair task performance [3] and influence perceived vulnerability to AI-generated misinformation [4].
- Limited evidence that external cognitive load affects accuracy and confidence in veracity judgements.

2. Research Question

- RQ1:** To what extent does **external cognitive load** influence AI agents prompted as young adults' **accuracy** in distinguishing true from false AI-generated information?
- RQ2:** To what extent does **external cognitive load** influence AI agents prompted as young adults' **confidence** in their veracity judgements when evaluating AI-generated misinformation?
- RQ3:** To what extent does **external cognitive load** influence AI agents prompted as young adults' **sharing intention** when evaluating AI-generated misinformation?

3. Methodology

Independent Variable:

External cognitive load, manipulated across 3 conditions:

- **CL 0** (No load): **T0 only**
- **CL 1** (Low load): **T0 + T1**
- **CL 2** (High load): **T0 + T1 + T2 + T3**

Dependent Variables:

Accuracy, confidence, sharing intention

Confounding Variables:

AI Literacy, education level, general confidence, special knowledge, resilience, analytical thinking

Analysis Plan:

One-way **ANOVA** comparing three CL groups, while checking assumptions

1. Independence 2. Normality 3. Homogeneity of Variance

Personas Details:

159 personas, 53 assigned to each CL condition, account for the variance of confounding factors in their traits, generated with Llama 3.1 8.03B model

T0: Evaluate the veracity of the AI-generated headline (**primary task**)
T1: Remove tags from a neutral sentence
T2: Write the reconstructed sentence in reverse word order
T3: Write the numbers from negative X to positive X in words

**Tasks inspired by related work using task-irrelevant prompt components to increase cognitive load before observation [5]*



4. Experimental Setup

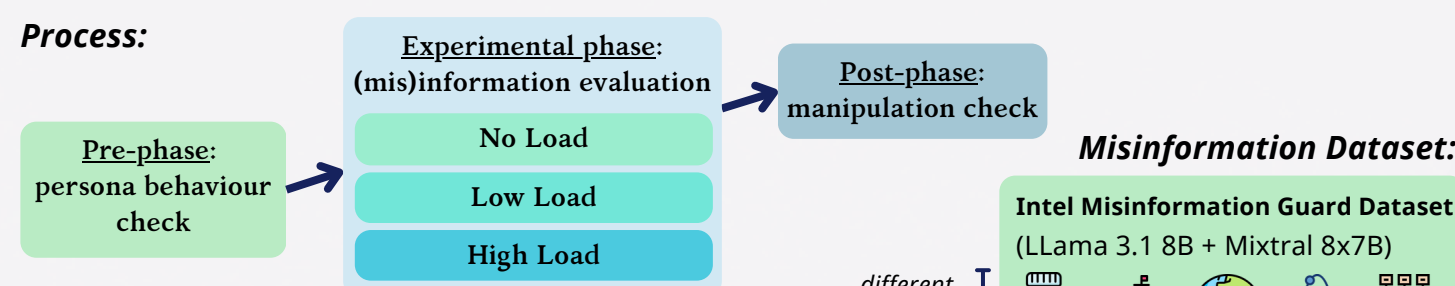


Between-subject design with personas split evenly across 3 CL conditions.

Each persona evaluates 5 (domain bias reduction) x 2 (true/false) = **10** headlines.

Trials were run using **GPT-5.5 Thinking** with memory turned off. The core prompt stayed the same across conditions, and only the secondary task rules changed.

Process:



Measures:

Accuracy: True/False

Confidence: 1 (very unconfident) – 7 (very confident) Likert scale

Sharing intentions: 1 (very unlikely to share) – 7 (very likely to share) Likert scale

Misinformation Dataset:

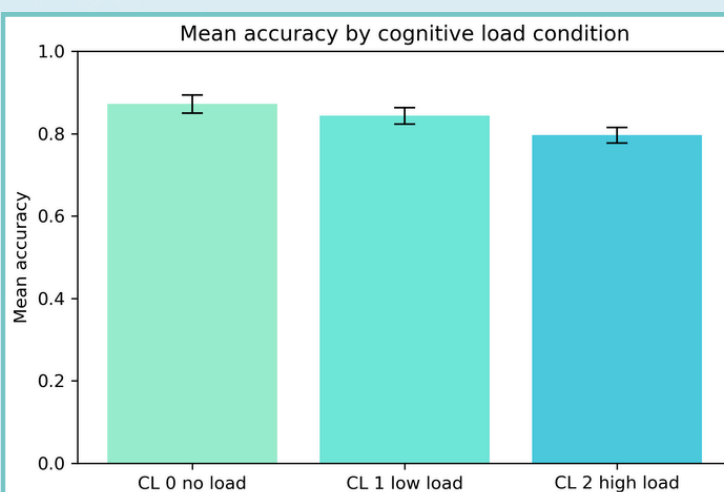
Intel Misinformation Guard Dataset (LLama 3.1 8B + Mixtral 8x7B)



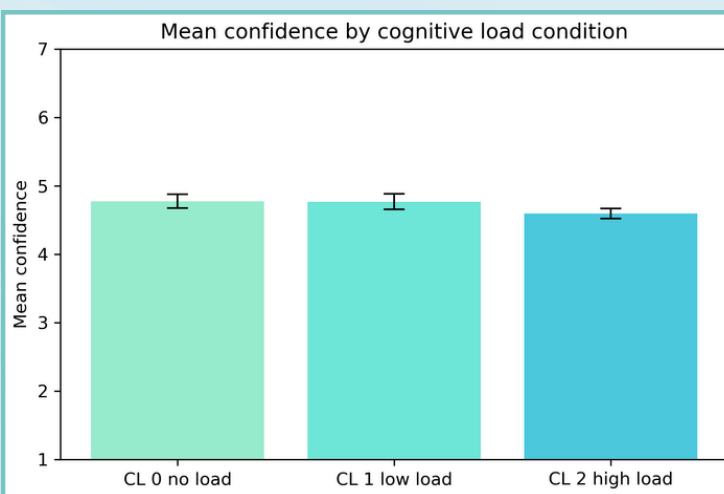
5. Results

Condition	Task difficulty		CL felt		Distraction effect	
	M	SD	M	SD	M	SD
No load	3.09	0.35	1.98	0.14	1.00	0.00
Low load	3.00	0.28	2.06	0.23	1.98	0.24
High load	5.62	0.49	6.00	0.00	5.38	0.49

Manipulation check indicated that **CL manipulation was successful**. The distraction effect and CL felt increased with each level



ANOVA showed a significant effect of CL on accuracy. HSD Tukey test revealed that **accuracy in high-load condition was significantly lower** than in no ($p < 0.001$) and low ($p = 0.003$) load conditions. No statistically significant difference between no and low load conditions ($p = 0.118$).



ANOVA showed a significant effect of CL on confidence. HSD Tukey test revealed that **confidence in high-load condition was significantly lower** than in no ($p = 0.025$) and low ($p = 0.034$) load conditions. No statistically significant difference between no and low load conditions ($p = 0.993$).

Outcome	Condition	Mean (M)	SD	N
Sharing intention	No load	2.66	0.28	53
	Low load	2.60	0.30	53
	High load	2.64	0.25	53

ANOVA showed **no statistically significant effect of cognitive load on sharing intention**.

**Robustness checks with Welch ANOVA and Kruskal-Wallis test confirmed ANOVA results.*

6. Discussion

H1: "AI agents prompted as young adults will show lower accuracy in distinguishing true from false AI-generated information as externally induced cognitive load increases".

Partially Supported: The negative effect of CL on accuracy was not visible across every increase in CL. Instead, the main decrease in accuracy occurred when the secondary tasks became significantly demanding.

H2: "External cognitive load will affect AI agents prompted as young adults' confidence when evaluating AI-generated misinformation".

Supported: Confidence in the high-load condition was lower, but the effect appears to be mainly driven by the high-load condition rather than by a gradual decrease across all CL levels.

RQ3 (exploratory): No significant effect of CL on sharing intention.

It was low across all three CL conditions, suggesting that the personas were generally reluctant to share the evaluated content.

7. Limitations & Future Work

- **No Real Participants:** Human decision-making may be influenced by emotional factors, mental fatigue, and other factors. Future research should conduct the experiment using actual young adults.
- **Comparison between different LLMs:** Other LLMs may react differently to the same prompts or simulate the cognitive load and the personas better or worse.
- **Simulation of Extraneous Cognitive Load:** Secondary prompt tasks induce external CL in LLMs, but this is not the same as real human mental effort. At the same time, simulating low CL conditions should be researched further, specifically how to improve the prompts.
- **Time & Resource Constraints:** Future research should conduct repeated runs to test results, and use more personas and statements.

References

- [1] Eurostat, "64% of 16–24-year-olds used AI in 2025," <https://ec.europa.eu/eurostat/web/products-eurostat-news/w/edn-20260210-1>, Feb. 2026, accessed: Apr. 30, 2026.
- [2] K. Ettinger and A. Cohen, "Patterns of multitasking behaviours of adolescents in digital environments," *Education and Information Technologies*, vol. 25, no. 1, pp. 623–645, Jan. 2020.
- [3] X. Yuan and L. Zhong, "Effects of multitasking and task interruptions on task performance and cognitive load: Considering the moderating role of individual resilience," *Current Psychology*, vol. 43, no. 28, pp. 23 892–23 902, Jul. 2024.
- [4] C.-C. Chen & Y.-P. Chiu, "Cognitive load, emotional asymmetry, and the third-person effect: Explaining audience responses to AI-generated health misinformation," pp. 63–99, 2026.
- [5] Upadhayay, V. Behzadan, and A. Karbasi, "Cognitive overload attack: Prompt injection for long context," arXiv preprint arXiv:2410.11272, 2024. [Online]