

Analysis of Cognitive Trust in Humans and AI Interaction Using Synthetic Data

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Abstract

Since the advent of generative artificial intelligence (AI), interactions between humans and AI have greatly changed society. Previous research indicates that AI's effectiveness depends on individuals' cognitive and emotional trust, and that increasing AI agency also affects its perceived trustworthiness. However, it is unclear which perceptions of cognitive trust are more reliable as the AI agency increases. The aim of this research is to examine individual perceptions of AI trust, compare perceptions before and after the emergence of generative AI, and identify the factors that influence users' perceptions of AI trustworthiness. Logistic regression examines four hypotheses regarding trust in human-AI interaction: social similarity, warmth, tangibility, and transparency. The data used in this study are synthetic, derived from subscribers' opinions expressed in newspaper coverage, as data collection obstacles hindered the acquisition of real world data prior to the emergence of generative AI. Analytical findings indicated that social similarity factors are statistically significant before and after the advent of generative AI. This suggests that AI's trust occurs within a domain characterized by social and cultural dimensions. Until now, many major AI companies have been established primarily in the West, leading to criticisms that AI lacks cultural diversity. This research found that the capability of AI's social and cultural understanding is advancing. However, warmth, tangibility, and transparency showed no statistically significant change. Especially regarding warmth, although earlier bots provided only generic responses, their linguistic capabilities have significantly improved in recent years. However, the hypothesis was not supported. It is assumed that most respondents have limited interaction with AI and may not yet see the benefits of recent AI advancements. Building trust between AI and humans remains a challenging research area. As a next step in future research, I plan to extend the timeframe and analyze a larger dataset.

Keywords: cognitive trust, humans and AI interaction, synthetic data, social similarity

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