

SPEECH STYLE MATTERS: EVALUATION AND COMPARISON OF IN-VEHICLE INTELLIGENT AGENTS WITH DIFFERENT SPEECH STYLES AND EMBODIMENT CONDITIONS IN AUTONOMOUS DRIVING

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ABSTRACT

In-vehicle intelligent voice agents can be beneficial to drivers as a companion in foreseeable autonomous driving. Speech style and embodiment are two widely researched characteristics, but the influence of their combination or interaction remained unclear. In the present study, we adopted a within-subject factorial design to evaluate the impact of two speech styles – conversational and informative – and embedment conditions – robot and voice-only – on both subjective assessments and objective measures of driver-agent interaction. Results from 24 young drivers showed that both the conversational style and the embodiment (i.e., robot) of the agent promoted drivers' likability and perceived warmth. Despite this, these two features demonstrate different influences on drivers' perceptions. Conversational voice agents received higher anthropomorphism and animacy scores, while robot agents received higher competence scores and lower perceived workload scores. The pupilometry indicates that drivers were more engaged while accompanied by the conversational agents. Our findings are able to provide design insights on how to emphasize different features of in-vehicle intelligent agents to fulfill various user needs in highly intelligent autonomous vehicles.

