Regaining Trust: User Evaluations of Transparently Designed In-Car Health Monitoring Data Collection

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Highlights

- RQ1 How does transparent user interface design positively impact users' experience of a health monitoring system?
- RQ2 Do users with health conditions have aversions to camera-based health monitoring systems in cars?

Method

N=42
U.S. Drivers with long-term health conditions

EXPERIMENT
Online study with participants recruited from prolific

1st Live Monitoring View Prototype
2nd Onboarding Prototype

Survey
Hedonic Quality (User Experience Questionnaire)
Pragmatic Quality (UEQ)
Creepiness (Seberger et al ., Tene et al., CRoSS)
Trustworthy Content (UEQ+)
Data Use Trust (UEQ+)

ANOVA and pair-wise t-test analysis
To confirm Hypothesis

Abstract

The advent of in-car health monitoring systems has the potential to enhance driver safety, but the use of camera-based sensing technologies raises significant privacy concerns. This study explores the impact of transparent user interface design on user acceptance of camera-based in-car health monitoring systems. We conducted an online study with 42 participants, using a set of prototypes that varied in design dimensions such as transparency level, choice level, and deception level. Our findings indicate that transparent design choices can significantly influence user experience measures, including perceived creepiness, trustworthiness of content, privacy trust, and hedonic and pragmatic quality. The study contributes to the understanding of the "privacy hump" in technology acceptance and provides practical insights for the design of in-car health monitoring systems. Our results suggest that transparent design can help calibrate the privacy hump to accurately reflect the privacy implications of in-car health monitoring systems, thereby aligning user perceptions with the normatively appropriate flow of information as defined by the theory of Contextual Integrity.

Process: Testing User Perceptions with Interactive Contextualized Web Prototypes

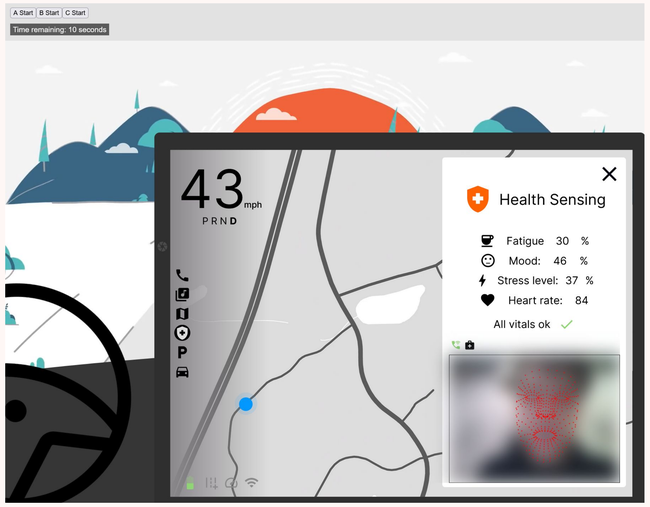


Fig 1. Tested Live View Prototype with Blurred Camera. (https://health-sensing-car.framer.website)

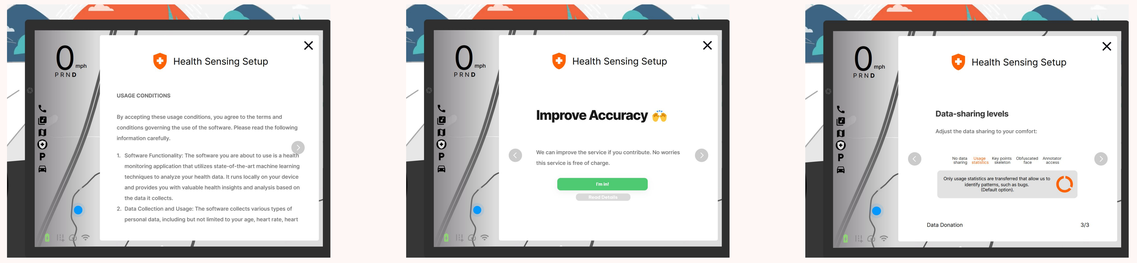
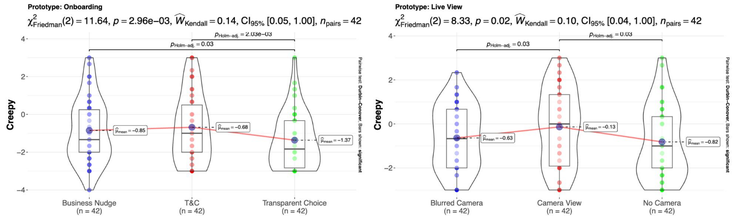
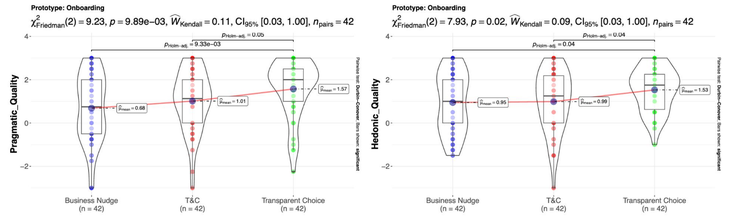


Fig 2. Tested Onboarding Prototypes. Left to right: Terms and Conditions, Business nudging towards their preferred options, Transparent choice.
Available at https://health-sensing-car.framer.website/X, /Y, and /Z.

Finding: A transparently designed onboarding and a blurred camera view reduce the perceived creepiness



Finding: Transparently designed onboarding improves the user experience as well as trust and perceived trustworthiness



Related work

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Takeaways

Design recommendations:

- Design for transparent data flows
- Do not nudge users against their interest
- Avoid using legal text, instead use an informative onboarding with infographics
- Do not prioritize task completion time over these other measures (business nudge was the easiest to use, but not liked)

Using cameras for health monitoring and AI data collection in private environments can be appropriate

- The tested designs assume a legitimate data collection purpose.
- I.e., collecting health data for improving the algorithms, not for marketing or insurance use