

How physiological data can improve persuasive technologies in mobile apps and wearables

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PhD candidate Hanne Spelt has investigated how constant monitoring of physiological data can help individuals improve their quality of life. Credit: Eindhoven University of Technology

Persuasive technology, like mobile apps and wearables, can support individuals in their journey towards a better quality of life. These tools are more successful if they adapt to the user, for instance on the basis of behavior measurements and self-reported experiences. Ph.D. candidate Hanne Spelt of the department of Industrial Engineering & Innovation Sciences has investigated how constant monitoring of physiological data can complement existing methods. She defended her thesis on Tuesday 2 March.

Persuasive technology (PT) is a promising way of stimulating health-related behavior change. PT can help individuals improve their quality of life. Combining persuasive strategies and health-related technology can persuade people to change their attitudes, intentions and potentially behavior.

Improving PT through sensors

PT is more successful if it adapts to the user, for instance on the basis of behavior measurements or self-reported experiences. But also state-of-the-art sensor technologies enable continuous measurement of the user's physiology, without disturbing them. Since physiological assessments of one's [mental state](#) differ from self-report or behavioral measurements, this could lead to innovative ways of improving PT systems. To illustrate, smart watches will be more effective if they can objectively measure the state of mind of their users.

Spelt's thesis presents an overview of current personalization methods in PT and describes how physiology can complement these existing methods. She proposes a model for physiology-aware PT systems, in which a system can adapt to the current physiological state of the user, and their physiological reactivity to a persuasion attempt.

Empirical studies

To support this model, four empirical studies were conducted. Overall, the findings indicate that people indeed show physiological reactivity to persuasive stimuli, although persuasion strategies per se do not appear to impact physiology differently.

Moreover, psychophysiological reactions to persuasion are best understood when you take into account the person's initial motivations (attitude, intentions, perceived behavioral control) and personality characteristics (susceptibility to persuasion, extraversion). Spelt's research also shows that considering physiological reactivity—in addition to traditional self-report measures—improves the prediction of [persuasion](#) effectiveness.

She concludes that [technological advancements](#) in combination with further psychophysiological research will permit powerful and ethical persuasive systems to improve the lives of their users.

More information: Towards Physiology-Aware Persuasive Technology: A study on psychophysiological reactions to persuasive messages. [research.tue.nl/nl/publication ... y-a-study-on-psychop](https://research.tue.nl/publication/2021-03-physiological-persuasive-technologies-mobile-apps.html)

Provided by Eindhoven University of Technology

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