

# People versus technology. Who can make you want to eat healthier?

Lab study DCM100, Constructive Design Research

Poster by Anika Kok, 1508482, a.k.kok@student.tue.nl

## Authors

Elske Borneman, Alessandro Ferretti, Anika Kok, Thomas Pilaet, Xander Verstraeten.

What are the differences between behavioral awareness generated by a person and behavioral awareness generated by an artificial agent?



A video-quided questionnaire was used for this LAB study [3].



Parameters used: credibility, desirability and intent for behaviour change.



Hypotheses were validated and other correlations were reviewed.



Evaluation by ten, five point Likert scale questions and two open questions.



questionnaires were completed in one week of which 60 were included in the analysis in Tableau.



Validation was done to check the reliability of the parameters and the significance of the results.

## Introduction

The home: a place for security and control, for activity, for relationships and continuity, and for identity and values [2]. But also a place for smart home products intended to lower energy consumption and improve convenience, efficiency, safety, health and pleasure. However, research shows that not all smart home appliances live up to their promises, as there are a lot of unintended side effects caused by the smart home devices [6]. This study is about researching the effects of smart home products further in order to gain a better understanding of how they can influence the choices of their users. In this case, as an opportunity to create awareness around food consumption.

Three hypotheses were formulated:

1. Social awareness created by humans has more credibility than an artificial agent [1].

2. Behavioral awareness raised by a human agent is considered more desirable than when raised by an artificial agent [4]. 3. The intent for positive behavioral change is higher when behavioral awareness is raised by a human agent.

### Conclusion

From the research can be concluded that all hypotheses can be confirmed. However, the validation test shows that the reliability and significance for the two parameters 'desirability' and 'intent for behaviour change' were less than for the first parameter 'credibility'. Therefore, further research is needed to affirm the conclusions on hypotheses two and three. The confirmation of the three hypotheses implies that smart home products such as the voice assistant in this case, could influence their user's behavior. In this case, the intent for behavior change related to food consumption was measured but the influence that artificial agents have on our behavior could extend beyond that.



#### **Research prototype**

Two videos with the same scenario but a different waiter were included in the questionnaire to visualize a specific scenario and context. The message brought by the human and artificial agent, was the same in both cases, so that the reactions to both of these could be compared.

From this study can be concluded that there are only a small differences in behavioural awareness created by humans and artificial agents. These insights and results can be used to make better choices in the design and advertisement of smart home products, but it also raises new questions such as: "What would happen if the artificial agent becomes more credible or desirable than the human?". Or: "What if the artificial agent is giving advice on other topics such as exercise or social activities, in the actual home context?". Questions that need to be studied further in order to gain a better understanding of the reasoning behind the found results and the effects of the ever changing presence of artificial agents in our lives.

[1] Edwards, A., Edwards, C., Spence, P. R., Harris, C., & Gambino, A. (2016). Robots in the classroom: Differences in students' perceptions of credibility and learning between "teacher as robot" and "robot as teacher." Computers in Human Behavior, 65, 627–634. https://doi.org/10.1016/j.chb.2016.06.005 [2] Gram-Hanssen, K. & Darby, S. J. (2018). "Home is where the smart is"? Evaluating smart home research and approaches against the concept of home. Energy Research & Social Science, 37, 94–101. https://doi.org/10.1016/j.erss.2017.09.037 [3] Koskinen, I., Zimmerman, J., Binder, T., Redstrom, J., & Wensveen, S. (2011). Design Research Through Practice: From the Lab, Field, and Showroom (1st ed.). Morgan Kaufmann. [4] Robinson, E., & Field, M. (2015). Awareness of social influence on food intake. An analysis of two experimental studies. Appetite, 85, 165–170. https://doi.org/10.1016/j.appet.2014.11.019 [5] Stange, S., & Kopp, S. (2020). Effects of a Social Robot's Self-Explanations on How Humans Understand and Evaluate Its Behavior. Proceedings of the 2020 ACM/IEEE International Conference on Human-Robot Interaction. https://doi.org/10.1145/3319502.3374802 [6] Strengers, Y. & Nicholls, L. (2017). Convenience and energy consumption in the smart home of the future: Industry visions from Australia and beyond. Energy Research & Social Science, 32, 86–93. https://doi.org/10.1016/j.erss.2017.02.008