

BACKGROUND

Embodied conversational agents (ECAs) are animated computer characters that simulate face-to-face counseling¹, and are able to:

- Establish and maintain an empathic relationship²;
- Provide timely feedback;
- Start and maintain a healthy lifestyle³



Literature on how to develop ECAs for healthy lifestyles, and on their impact and uptake, is lacking

OBJECTIVE

Identify current practices in designing and evaluating ECAs for healthy lifestyles

METHODS

- Method: Arksey and O'Malley framework for scoping reviews⁴
- Databases: PsycINFO + PubMed + Scopus
- Search concepts: 'ECAs' and 'healthy lifestyles'
- Identified: 1.789 single studies
- Included: 20 studies

RESULTS

Design process

- Most interventions use multiple theories (*Mdn*=3, range=1-4, 8/20 Transtheoretical Model) and Behavioral Change Techniques (*Mdn*=3, range=2-10, 14/20 'Goal setting')
- Three studies report on the design process of the appearance; they describe a focus group or a survey with end-users
- One study includes multiple stakeholders for the design of the content

Evaluation process and outcomes

- A typical study design is a four week RCT of the pilot phase (none of implementation), with a small group of end-users
- A typical usage pattern shows a decrease after time

Efficacy outcome	S.	N.S.	Process outcome	S.	N.S.
Lifestyle behavior	5	6	Ease of use	1	0
Health related knowledge	0	2	Frequency of use	4	1
Mental states (e.g. stress)	1	1	User satisfaction	1	2

CURRENT PRACTICES

- Detailed information on the design and design process is usually not provided. Therefore, it is unclear to what extent interventions are theory-based
- Typically, end-users are involved after the ECA has been designed, although the appearance is often matched to the study population (e.g. African-American women)
- The evaluation is focused on identifying whether the intervention as a whole is effective, although process outcomes are measured (e.g. through logdata)

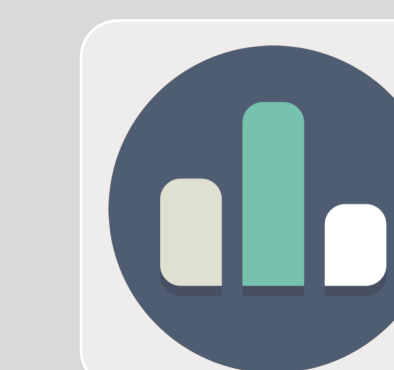
RESEARCH AGENDA



- How can ECAs provide timely feedback?
- Should end-users and/or stakeholders be involved in the design?



- Which intervention characteristics are effective?
- Should we match ECAs and users characteristics?



- Is there an ideal frequency of use?
- How to deal with the novelty effect?

CONCLUSION

ECAs can effectively coach people in starting and maintaining a healthy lifestyle. However, answers are needed on more fundamental questions regarding the design and evaluation. We propose a research agenda on these fundamentals in order to make ECAs better lifestyle coaches.

REFERENCES

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3. Watson, A., et al., An internet-based virtual coach to promote physical activity adherence in overweight adults: randomized controlled trial. *J Med Internet Res, 2012. 14(1): p. e1.*
4. Arksey, H. and L. O'Malley, Scoping studies: towards a methodological framework. *International Journal of Social Research Methodology, 2005. 8(1): p. 19-32.*

PROJECT

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