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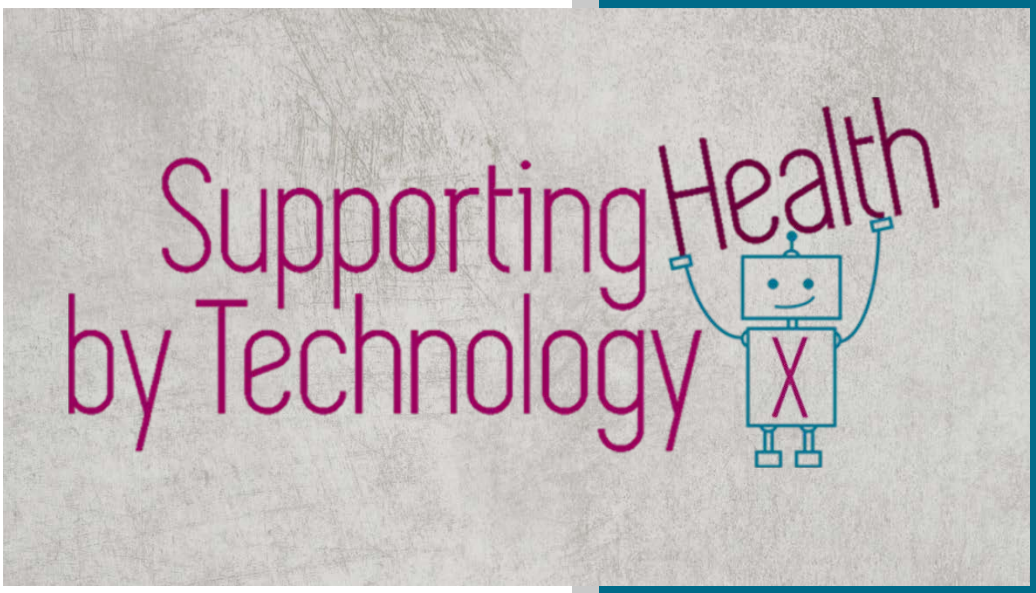

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Let's Talk About It! Social Robots for Eliciting Disclosures for Emotional and Psychological Health

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Background

People tend to disclose thoughts and feelings with others, especially when experiencing unique life events. This is an evolutionary function of strengthening our interpersonal relationships, but also for producing a wide variety of health benefits. These include coping with stress and traumatic events, eliciting help and support (Frattaroli, 2006; Frisina, Borod, & Lepore, 2004; Kennedy-Moore & Watson, 2001), and playing a critical role in successful treatment outcome (Sloan, 2010). Given the importance of self-disclosure for psychological health, here we are interested in assessing the viability of using social robots for eliciting rich disclosures to identify needs and emotional states. We expect that people will ascribe mental capacities to these following social robots' human-like design and gestures (Epely & Waytz, 2010), and thus disclosures to social robots will be genuine in nature.

Methods

Two (N = 26 & N = 27) within-subjects experiments with three treatments were conducted. In a random order, participants were asked one (in the first experiment) or two (in the second experiment) pre-defined questions about their life by each of the three different agents: (1) a social robot, (2) a human, or (3) a voice assistant, demonstrating different visual and verbal cues that corresponded appropriately to their embodiment. After the three interactions, participants answered a questionnaire reporting on their perceptions of self-disclosure (adapted from Jourard, 1971) for each of the agents. The interactions were recorded for content and voice analysis, extracting the length (in number of words) and duration (in seconds) of the disclosures, the compound sentiment and sentimentality (see Hutto & Gilbert, 2014) of the disclosures' content, and the pitch, harmonicity, energy, and intensity of the participants' voice.

Findings

The first experiment entails that people perceived to disclose more to a human than to a robot and a voice assistant. No differences between the agents were found in terms of observed measurements of disclosure. The second experiment entails that people perceived to disclose less to a voice assistant than to a human and a robot. Moreover, people were sharing more information and were speaking longer with a human than with a robot and a voice assistant. Finally, participants' voice was more intense, and their pitch was higher when speaking to a robot, compared to when speaking to a human or a voice assistant.

Discussion

As social robots are gradually being introduced in health interventions (see Robinson, Cottier, & Kavanagh, 2019), this study provides preliminary evidence for people's perceptions of disclosers to robots, compared to objective evidence of the disclosed information. While people perceive they disclose more to a human than to a robot or a voice assistant, no actual observed differences in the content of the disclosure or in the participants' voice acoustics emerges between the three agents in the first experiment. Nevertheless, the results of the first experiment did not replicate in the second experiment. This calls for further investigations of the psychological underpinnings of self-disclosures to robots, and the potential role of robots in eliciting disclosures as part of health interventions.

Go up in smoke: proof of concept study on tobacco craving in a VR environment

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Background

Recent technological developments in virtual reality (VR) provide a potential to reduce the burden of tobacco addiction. Despite efforts to reduce smoking initiation and to increase smoking cessation, still approximately 19.2% of female and 25.7% of male adults in the Netherlands smoke. Recent research indicates even higher prevalence rates in vulnerable groups, such as individuals with intellectual disability, mental illness, or low socio-economic status. One of the factors in the persistence of tobacco related disorders, is that smoking cessation programs are only successful in about 10-16% of patients. Moreover, existing treatments may not be suitable for vulnerable groups, which might hinder uptake and effectiveness.

Several studies in the area of VR have assessed the potential to evoke craving as part of cue-reactivity. However, research on cue-exposure therapy, which is based on the extinction of a conditioned response, reports only limited effects. Thus, teaching coping strategies in VR that are related to real-life situations, might be a potential approach for behavior change, especially in groups that barely benefit of existing cessation programs.

Methods

This research comprises two evaluations with each three iterations as part of a user-centered development approach. Recruited participants were heavy smokers (Fagerström >= 5) from three Dutch healthcare institutions, involving individuals with intellectual disability, mental illness, and pulmonal issues. The first part of participants derived from every subgroup participated (1) to improve the cue-reactivity environment, procedure and related measurements. The other part applied (2) virtual coping strategies after being exposed to the previously improved cue-reactivity environment to explore and refine possibilities for craving reduction. Self-reported data (VAS, QSU-Brief), psychophysiological measures (GSR, HR), and eye-tracking were used as a potential continuous measurement of craving. Moreover, the think-aloud protocol was employed to improve the user's experience based on the cognitive insights.

Findings

Twenty-three participants participated in the first study group to improve the cue-reactivity and related measurements within the virtual environment. Preliminary results indicate a significantly increased level of craving after exposure compared to baseline. Participants in all subgroups successfully managed to use the VR-application while an increasing age revealed more problems in handling controls. Smoking-related cues and contexts were rated highly individually due to personal habits. The incorporated multimodal interactions involving smell, sound, and haptics have been identified to be important factors that influence cravings. Moreover, social influences and emotional distress have been reported to influence the urge to smoke. To continuously monitor craving levels in vulnerable groups, eye-tracking has been reported unfeasible due to complicate calibration procedures. Furthermore, motion artifacts and uncontrollable contextual variables might bias the measurement of galvanic skin responses.

Discussion

The preliminary results are in line with the previous research in the field of VR cue-reactivity by showing significant increases in craving within the subgroup of vulnerable individuals. The iterative development approach indicates a need for highly personalizable environments with complex multimodal cues, that

involve social interactions and affective influences. Future research should investigate the potential of coping skills training by providing scientifically validated relaxation and distraction exercises.
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Hemodynamic Monitoring with CardioMEMS in Heart Failure Patients: Rationale and Design of MONITOR HF trial

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Background

Assessing hemodynamic congestion based on filling pressures instead of clinical congestion can further improve quality of life (QoL) and clinical outcome by intervening before signs and symptoms occur in heart failure (HF) patients. CardioMEMS® (Abbott Inc., Atlanta, GA, USA) is a small implantable sensor capable of measuring pressures in the pulmonary artery (PA) on a daily basis. The CardioMEMS HF System® includes an implantable wireless sensor with delivery catheter, a patient and hospital electronics system and a patient database (Integrated Merlin.net website for Patient Data Management). The sensor measures PA pressure using MEMS (micro-electromechanical systems) technology and requires neither battery nor leads. The sensor is implanted in a branch of the left PA via a transvenous catheter inserted through the femoral vein. PA pressures can be used as an invasive hemodynamic surrogate marker of filling pressures, which has been shown to precede a period of decompensation for several weeks. This time window would enable the physician to intervene before clinical symptoms arise and act in a pro-active way to avert an exacerbation of HF and a HF hospitalization by adjusting the dose of diuretics or vasodilators. The clinical efficacy of remote monitoring of PA pressures by this system has been demonstrated in the USA. Currently, the PA sensor is not reimbursed in the European Union as its benefit in addition to standard HF care is unknown in Western-European countries.

Aims

To demonstrate efficacy and cost-effectiveness of hemodynamic PA monitoring in addition to contemporary standard HF care in a high quality Western European health care system, as part of a conditional coverage programme in the Netherlands for the health care related costs.

Methods: The MONITOR HF study is a Dutch prospective multi-center, randomised clinical trial in 340 patients with chronic HF (New York Heart Association (NYHA) functional class III) randomised to remote monitoring with the CardioMEMS® PA sensor on top of standard HF care or standard HF care alone. Eligible patients have at least 1 hospitalization for HF in 12 months before enrolment or an ER visit for unplanned intravenous diuretics; and will be randomized in a 1:1 ratio. Minimum follow-up will be 1 year and maximum 36 months. The primary endpoint is the change in QoL as measured by the Kansas City Cardiomyopathy Questionnaire HF questionnaire. Secondary endpoints are the number of HF hospital admissions and changes in health status assessed by EQ-5D5L questionnaire including health care utilization and formal cost-effectiveness analysis.

Findings

The study started enrolment on April 1st 2019. The MONITOR HF trial will evaluate the efficacy