
Voice User Interfaces for mental healthcare: Leveraging technology to help our inner voice

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ABSTRACT

The Covid-19 pandemic has affected our lives in unexpected ways. For many, lockdowns and isolation have disrupted our social lives, affecting our mental health due to e.g., loneliness. As a potential remedy for current outbreaks or future lockdowns, Voice User Interfaces that promote self-compassion can be explored for preventive mental healthcare. We discuss Conversational User Interfaces and self-compassion first. Then, we outline why Voice User Interfaces for promoting self-compassion in times of isolation is a crucial area of future research that the CSCW community can engage with.

CCS CONCEPTS

• **Human-centered computing** → **Natural language interfaces.**

KEYWORDS

conversational user interfaces, voice user interfaces, voice assistants, voice-bots, preventive mental healthcare, care-receiving conversational agents, caregiving conversational agents, self-compassion

INTRODUCTION

Due to the pandemic, there is disruption in social lives, with the resulting risk that people face a lonelier world. Based on the information on previous outbreaks of infectious diseases, the current circumstances can lead to devastating implications for mental health: in the aftermath of the 2003 SARS epidemic in Hong Kong, the suicide rate in people aged over 65 increased by 30% [16]. Patients with suspected 2019-nCoV in quarantine might experience boredom, loneliness, and anger [27]. In a broader sense, a combination of social isolation, loneliness, health anxiety and potential economic

downturn risks can be detrimental to mental health and well-being. While intervening to help people's mental health status during the current pandemic is important, future options can ideally focus on prevention rather than cure.

CONVERSATIONAL USER INTERFACES IN MENTAL HEALTHCARE

Many technological advancements we see in our daily lives have first taken birth in literary or on-screen fiction. Conversational User Interfaces (CUIs) are one such example. Samantha in 'Her', J.A.R.V.I.S. in the 'Iron Man' franchise, and HAL 9000 in '2001: A Space Odyssey' are only a few but popular instances of CUIs appearing in popular culture [3]. Now with the increasing prevalence of CUIs in both personal and business domains, like Google Home, or Alexa, we can imagine interactive agents that provide emotional support and companionship in these trying times. In fact, two popular examples of CUIs developed for mental health care through cognitive behavioural therapy are Tess and Woebot [10][11]. But these developments are mainly focused on curing an illness rather than prevention and are not specified to people's experiences during a pandemic.

Though in recent times, discussions on mental health are being encouraged and information regarding access to help is available, people are prevented from seeking out help due to the stigmas surrounding mental health [4]. Further, the implementation of infection-control measures has made it only harder for people to seek professional help during the pandemic. To alleviate pre-existing problems with respect to ease of access to professional mental healthcare, computerized versions of therapy can be used to improve access to evidence-based therapies for the patients while reducing the demand for clinician time [24]. Alternatively, the therapist can be computerized. Due to the recent advances in machine learning, CUIs can be developed to act as therapists based on the Computers As Social Actors (CASA) paradigm [17]. Since the CUIs are online and can be accessed 24/7, this lowers the threshold of effort needed by the users to reach out for help. Further, the lack of judgement by a CUI can aid the user in disclosing their emotions [14][21].

Self-Compassion with CUIs and VUIs

One emotion that's particularly helpful in times of self-isolation is self-compassion since it can reduce feelings of loneliness [1]. Self-compassion is the ability to be kind and forgiving towards oneself when faced with hardships or perceived inadequacy [18]. It also entails acknowledging that suffering, failure, and inadequacies are part of the human condition, and that all people—oneself included—are worthy of compassion [20]. Further, higher scores on self-compassion are related to lower scores on symptoms of depression and anxiety [15][18].

Existing literature establishes a firm relationship between loneliness and mental health. Greater loneliness predicted greater stress, anxiety and depression in undergraduate students [22]. Further,

dementia, anxiety and depression are also associated with loneliness in the elderly [2][23]. Since feelings of depression, anxiety and loneliness are found to be connected, self-compassion can potentially combat their interrelated symptoms.

There are many human-led therapies to stimulate self-compassion [19][12], as well as an increasing number of computerized formats such as online self-help guides [5][9]. Recent developments in VR have also led to studies involving embodying self-compassion to overcome depression and excessive self-criticism [7][8].

Prior research explored a text-based CUI, a chatbot called Vincent for improving self-compassion in non-clinical samples [13][25]. Vincent resembled Woebot and Tess to some extent but differed from its role in relation to the person it interacted with. Surprisingly, a care receiving (CR) chatbot that asks for people's care might actually outperform the traditional caregiving (CG) counterparts that acts as a therapist in stimulating self-compassion [13]. By activating people's inner caregiver with a bot, people can learn to care for themselves. In this, a prolonged interaction, rather than a single interaction, can better enable the participants to exhibit compassion towards a chatbot [25].

Yet, no prior research has been done on Voice User Interfaces (VUIs) to promote self-compassion. Emotional disclosure through speech, when compared to writing, achieved the greatest improvements in cognitive change, self-esteem, and adaptive coping strategies [6]. This implies that the benefits of self-compassion can be effectively reaped through the use of speech. Further, speech is the most common way for humans to communicate, and thus it has been a common modality to interact with machines for a long time [26].

FUTURE RESEARCH

VUIs can support an individual's personal health and well-being through empowering them to be more compassionate towards themselves. There are two future research agendas to explore. First, VUIs that can provide care or ask for care from people and second, anthropomorphism of VUIs and its effect on the self-compassion of an individual require more in depth attention.

By exploring these research agendas, VUIs that are more readily accepted by the public can be developed. Further, the stress on existing mental health services can be reduced, and high-quality service can be made more easily accessible to the masses, especially in times like the current pandemic.

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