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Psychosocial Implications of Avatar Use in Supporting Therapy for Depression

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Abstract. Help4Mood is a novel intervention to support the treatment of depressive disorder using an embodied communicative agent (Avatar) to engage the user with therapy tasks. We conducted 10 focus groups with patients and mental health professionals, in the UK, Spain and Romania, in order to explore issues around usability and contextual fit. Emergent themes related to the design and use of Avatars indicated the value of configurability for optimising personalisation and perceived trustworthiness; the importance of supplementing rather than replacing face-to-face interaction, and perceptions of the agent as therapeutic ally or supportive friend. The use of Avatars in psychotherapy is relatively new and its acceptability, value and risks are unknown. These results indicate that users wish to engage with Avatars that meet their personal preferences and fit appropriate role expectations. The perception of Avatar as colleague or friend raises conceptual and ethical issues which merit further research. Claudia.pagliari@ed.ac.uk

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Introduction

Depression affects around 120 million people worldwide, yet fewer than 25% of sufferers have access to effective treatment.[1] This is due to a combination of factors, including the somewhat hidden nature of psychological conditions, social stigma as a barrier to help-seeking, and the lack of training for professionals in diagnosis and management of depression. This situation is compounded by the time and expense required to deliver psychological interventions for depression. For this reason drugs are often the first line treatment option, sometimes with negative side effects and typically without the necessary behavioural support needed to maximise their effectiveness.

The economic and societal costs associated with depression are as significant for populations as the morbidity and mortality impacts are for individuals.[2] As with other chronic illnesses, it is vital that new ways are found to manage an increasing health

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burden with finite resources and ICT-based interventions have been proposed as a way of filling the gap. Cognitive behaviour therapy is as an effective treatment for depression involving therapist-guided exercises that encourage the patient to recognise self-critical or fatalistic thought patterns, reinterpret life events in a more positive light and engage in goal-directed actions. Computerised Cognitive Behaviour Therapy (CCBT) is designed to support the patient with such exercises between clinic sessions or, in some cases, as an alternative. It is one of the most well-researched online health interventions and has been shown to be useful in symptom reduction, although ideally when delivered as part of a therapist-supported package of treatment. [3]

Adherence with online CCBT is affected by both the inertia that characterises depression and the initial reduction in symptoms that it can bring, but failure to persist with and complete a course of CCBT can greatly reduce its effectiveness. [4] Agent-based approaches, which enable responsive tailoring of services and feedback to input-defined user needs, offer one means of addressing this problem, through reducing repetition and personalising the user experience. With advances in computer-generated humanoid mediators (Avatars), speech recognition, speech synthesis and affective computing, the possibility of simulating therapeutic encounters is coming closer to reality. Although the prospect of a convincing 'AI-therapist' is some way off, there are aspects of online treatment packages for which embodied communicative agents may be useful, such as in guiding the user through treatment exercises and prompting self-monitoring. The use of Avatars in online psychotherapy has been demonstrated in the context of virtual worlds, where the characters symbolise the actual therapist or patient, however this presents similar resource challenges to in-person therapy.[5] Their suitability and value in the context of algorithm-driven CCBT packages is unknown.

Help4Mood is a collaborative project supported by the EC Framework 7 programme (www.help4mood.info). It has two aims, firstly to examine new ways of *engaging* patients with online interventions, by using an embodied communicative agent to elicit symptom reporting and encourage CBT task completion, and secondly to manage and relay activity data captured by remote *monitoring* devices, such as movement sensors located in patients' beds or wrist-worn actigraphy devices. This data is used both to facilitate the patient's between-clinic self-management, and to provide a record that can be used by their therapist to guide or modify treatment in the context of face-to-face sessions. This article describes a formative study with patients and health professionals, which aimed to capture requirements with reference to likely contexts of use. It specifically focuses on issues for the design and use of Avatars within the intervention.

Methods

Ten focus groups with patients and health professionals were conducted in three countries; the UK, Spain and Romania. In each country professional participants were chosen to represent the groups that typically provide care for patients with depression (psychiatrists, psychologists, community psychiatric nurses). In total there were 3 groups of patients (one in each country) and 7 groups of professionals (2 UK, 3 Romania, 2 Spain).

Discussions were facilitated by two researchers and recorded with the participants' permission. Transcripts and field notes were analysed thematically, initially by one researcher in each country and then in consultation with the local research team. While

different languages present challenges for qualitative analysis, these were minimised by using a shared analytic framework in order to capture parallel issues across the three teams, whilst also enabling local issues to be captured. The results across groups were discussed by the international team in order to explore generic and specific issues relevant to the design of the Help4Mood interface and methods for patient monitoring and communication.

The topic guide explored the components of the intervention with the aid of still mock-ups of the interaction and data interfaces. Participants were encouraged to reflect on whether the vision of the R&D team was congruent with the reality of clinical practice and suited to the characteristics of depressed individuals, and its possible benefits and risks. They were also asked to offer suggestions for improvement.

Results

Here we report the results specifically related to the design of the Avatars and their use in the therapy process. We have collapsed the responses of participants in the three countries, since these were largely congruent. Six themes related to the Avatar emerged:

Configurability & personalisation:

All groups felt that it should be possible to adapt the Avatar to suit user preferences; for example by changing age, gender or voice, or substituting a hyper-realistic image with a more cartoon-like one, or even with an animal. This recognised that individuals have different styles, preferences and expectations for embodied agents and that children, in particular, might prefer non-human alternatives.

Trustworthiness:

Patients indicated that the Avatar should look like the type of person they would wish to engage with and be happy to confide in in real life. Interestingly, reactions to the first visual character - a buxom young female – were not as positive as its young male developers had expected, indicating that factors other than physical attractiveness need to be taken into account when designing responsive systems, especially in a sensitive context like psychotherapy.

Avatar as professional ally:

The responses of health professionals reflected those of the patients, with a heavy emphasis placed on the apparent trustworthiness of the supposed character represented by the Avatar, particularly since it would, in a sense, be acting as a member of the therapy ‘team’. It should therefore look like the sort of person they would expect to see in such a setting, someone with whom they would be comfortable working, and who they would feel comfortable about recommending to their patients.

Functional role of the Avatar:

Professionals believed that the Avatar should be capable of empathic facial expression, as this can encourage patient engagement, but that it should maintain a 'neutral face' when encountering negative input from the patient, since reflecting this back would be unhelpful. They also felt that the system should generally be 'guiding' rather than 'directive', except where patient responses indicate a possible risk of suicide, in which case it should shift to directive mode. The importance of adaptive interaction (delivering screening questions or advice based on previous answers or patterns) was emphasised as a means of personalising the user experience.

Avatar as sensible friend:

Patients formed certain expectations of the Avatar, seeing it not just as medium for interacting with the 'system', but as a person. Importantly the view was expressed that it could act as a "sensible friend" in being able to "recognise" times of difficulty and step in to offer wise reflections or recommend a prudent course of action. At the same time, they acknowledged and supported the idea that the system would be used in association with real clinical care.

Fear of replacing human interaction and support:

Among both patients and professionals there was some anxiety that the system could potentially be used to replace human interaction and support, and it was regarded as essential to emphasise its role as a supplement to existing therapy, rather than a substitute.

Discussion

The results of this formative study highlight a number of issues relevant to the design and use of humanoid mediators in agent-based interactions, particularly in the psychotherapeutic context. Some of these challenged the developers' preconceptions, but most are consistent with emerging theory in this area.

In terms of design, the importance to users of being able to tailor the Avatar's physical, vocal and emotional features is perhaps unsurprising [6], although it is interesting that both personal characteristics, such as age, and role expectations based on contextual 'scripts' (e.g. how therapists look and behave), influenced user preferences. The perceived nature of the interaction between human users and humanoid mediators was rather more complex than anticipated, however. While the Help4Mood Avatar is merely a medium for agent-based interactions (semi-autonomous seek and retrieve functions), even at this pre-product stage potential users were beginning to endow it with social (e.g. friend, colleague) and psychological (e.g. trustworthy, honest) characteristics and to form certain expectations related to these characteristics (e.g. for watchfulness, protection, wisdom). Nevertheless participants' insistence that such systems could augment but, never replace, face-to-face care and therapists' caution around the correct balance of 'guiding' and 'directive' support, both indicate a recognition of their limitations.

The use of human-like agents in online business transactions, and 'mini-me' Avatars in virtual worlds such as Second Life, is becoming widespread and anthropologists have speculated on the various ways in which these might be absorbed into our perceptions of the social world. For example, our tendency to anthromorphise non-humans (endow them with human qualities) can produce benefits where value is to be gained from the social - as in robot pets - but it also introduces risks and uncertainties, particularly where expectations for protection or wisdom are created - as in the case of algorithm-driven monitoring and feedback loops in telehealthcare, or where an embodied software agent is perceived as a therapist or friend. This creates conceptual challenges around the nature of human and non-human relationships and trust, and also ethical challenges around professional substitution and trickery, which need to be addressed if such systems are to be introduced more widely.[7] While appropriate briefing of users can help to avoid possible misapprehensions, it must be recognised that social projection is an inevitable consequence of our human need to understand others, presenting a classic dilemma in social computing - creating things that are real enough to be useful but not too real as to mislead. [8]

The findings of this formative study raise important questions about the nature of users' interactions with embodied communicative agents in the context of online psychotherapy. For example; to what extent are these perceived as 'social' agents, as opposed to instrumental ones; what social or emotional value do users gain from such encounters, what expectations does the technology generate and what implications does this have for the appropriate design and safe implementation of such systems?

Conclusion

The use of Avatars in psychotherapy for depression is relatively new and its acceptability, value and risks are unknown. These preliminary results suggest that while such technology offers great potential for engaging patients in the treatment process it is not without challenges. Appropriate choices of Avatars need to be provided and the technology should be introduced sensitively alongside current treatment processes. Users wish to engage with Avatars that meet their personal preferences and fit appropriate role expectations. The perception of Avatar as trustworthy colleague or friend raises conceptual and ethical issues which merit further research.

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