
Changing Peer Support Attitudes with Avatar-based Gamification

Long Ting Chan

University of Waterloo
Waterloo, ON N2L 3G1, Canada
Lt2chan@uwaterloo.ca

James R. Wallace

University of Waterloo
Waterloo, ON N2L 3G1, Canada
James.wallace@uwaterloo.ca

Submitted to CHI 2018 for review.

Abstract

Demand for mental health services often cannot be met, resulting in high costs and lengthy wait times. In response to this problem, technological solutions have been proposed, such as computerised cognitive behavioural therapy (cCBT) and online peer to peer (P2P) support groups, which have been shown to be effective for non-severe cases of anxiety and depression, and can sometimes exceed the effectiveness on F2F therapy. However, P2P support is often viewed as inferior, and this perception has demotivated participation in existing cCBT P2P platforms by potential peers. To address this perception, we are designing a novel cCBT P2P game that uses gamification techniques to motivate players to participate as helping peers. Specifically, we are examining the Proteus Effect, which purports that a player will adopt qualities of their avatar in a contextual narrative.

Author Keywords

Mental health; Cognitive behavioural therapy; Peer to peer support; Gamification; Proteus Effect.

ACM Classification Keywords

H.5.m. [Information interfaces and presentation]: Miscellaneous; J.3 Life and medical sciences: Health.

CBT: A form of short-term psychotherapy which explains that a person's thoughts, emotions, and behaviours are connected and thus modifying thoughts can influence emotions and behaviour [6].

Cognitive Appraisal: A CBT process where negative automatic thoughts are reframed to decrease undesired behaviours [6].

Panoply example:

Thought: "I really like my friends but they are all kinda 'alpha male' types. Very extroverted and such. I'm not and so I get ignored a lot. I feel like a loser when I am with my friends and never say anything. I feel like they only tolerate my presence."

Reframed: "It is ok to not be the most outspoken or 'alpha' in a group. Maybe your friends prefer to be the center of attention and appreciate your quiet demeanor."

Introduction

With the rising rates of mood disorders such as anxiety and depression, the use of informal mental health services has also increased. One of the solutions explored by the health care community to meet demand include online peer to peer (P2P) support, seen on social media sites, as well on use-specific platforms. P2P support is particularly attractive, in that it facilitates the CBT therapies that have been widely shown to be effective in practice, while lessening the burden on physical facilities.

However, P2P approaches also have drawbacks. For instance, they have high dropout rates for P2P platforms compared with face to face (F2F) methods which involve human interaction [7]. Where academic studies, such as that by Morris, found potential interest by study participants [15], real world critics have often reported disinterest and drop-outs in practice [5]. As a result of these perceptions, the public has been reluctant to participate in P2P cCBT [7].

A second concern with P2P services include risks of biases formed due to the majority of participants being mental health care users, termed service users (SU) influenced by their own experiences and lose the ability to be objective [10]. Due to the unique norms in the homogenous community, skills learned transfer to daily life with difficulty. Encouraging participation from non-service users (NSU) to add diversity and to validate that skills learned in P2P communities can address these issues [10].

To address these drawbacks, we are exploring the use of gameful design in CBT P2P to maintain interest, increase engagement, and motivate NSU participation.

We will design and evaluate the effectiveness of an avatar-based serious game for changing players' helping attitudes, through the Proteus Effect – a phenomenon identified in the literature where players are influenced by traits of their visual representations [15]. In particular, we aim to understand whether the Proteus Effect can be used to encourage more supportive and engaging behaviour in NSUs.

The engagement levels of our game will be measured against a control based off the platform designed by Morris. It is theorized that the serious game would (1) show higher engagement in P2P support; (2) increase player's attitudes towards helping others; and (3) strength of Proteus Effect would be mediated by engagement levels and pre-existing attitudes.

Background

Computerised cognitive behaviour therapy (cCBT)
CBT has been repeatedly shown to be effective for a wide array of disorders, with meta-analyses supporting its use in anxiety disorders and general stress [7]. cCBT programs also evidence effectiveness in the UK [9] while improving accessibility of CBT treatments yet suffer low uptake by the public [2, 14].

Online P2P Support

In a systematic review on the effectiveness of mental health online forums for youth, P2P was often included in online interventions and were most effective for anxiety and smoking cessation [1]. Morris experimented with crowdsourcing to replace the solitary CBT process of cognitive appraisal and developed a platform called *Panoply* (no longer maintained) which allowed participants to appraise

Serious Games: Games designed to persuade players to fulfil a purpose other than for solely entertainment, such as performing behaviours to improve their health. Goals are often prosocial.

Gamification: The incorporation of game design elements such as reward systems, goals, challenges, and storylines to non-game contexts to motivate engagement.

Proteus Effect: In studies of self-representation, players have taken on stereotyped traits of avatars they use and identify with in virtual games, even if the traits are not true to their offline selves. This phenomenon has been named the Proteus Effect [15].

each other's thoughts [12]. *Panoply*, when compared to a one-way expressive writing control, showed higher engagement [12].

INCLUSION OF NSUs

A P2P support group with only SUs may establish expectations of mental health not held by the outside community, due to their unique shared experiences. Such norms can cause skills learned from within the community to be inapplicable to daily life [10]. Inclusion of NSUs in P2P communities can prevent group bias, and reduce the perceived separation between the diagnosed and undiagnosed which Mead purports to be counter-constructive towards efforts for reducing stigma [10]. However, NSUs may not be interested in joining P2P groups in the same way as SUs.

Serious Games

BLAPs are commonly used to gamify CBT, such as in mobile game *SuperBetter*, yet current games research claim rewards as ineffective beyond short term change and favour providing experiences instead [3]. A successful case is CBT administered in the form of a fantasy role playing game called *SPARX* lead to higher remission rates in clinical depression [11].

Given their barriers of perceived ineffectiveness and user disinterest, incorporation of gamification into P2P support tools, could motivate engagement and also present the services with appealing mediums for a NSU audience.

THE PROTEUS EFFECT

Studies have shown increased offline confidence by players when they used a taller, attractive avatar,

which they identified with in the context of the virtual space [13, 15]. The use of avatars and narratives in P2P serious games could encourage both helpful online and offline behaviour. There are no studies exploring the Proteus Effect on changing attitudes towards helping others.

Game Design

The proposed game design for this study will be a single player adventure game. The player will be told that others in their community have submitted queries containing negative thoughts prior to their gameplay, and their role is to appraise these thoughts using a pre-built format based on CBT like *Panoply*. Players will also be told that their submissions will be received by mental health groups in their community for service improvements. Our main interest lies in the motivation for helping others, especially for disinterested NSUs, rather than seeking help. However, players will receive notifications from the game when their submissions have been viewed by the researchers, to add elements of social interaction.

Players will choose from various premade avatars. Personalization options aim to establish identification between player and avatar to enable the Proteus Effect. The goal for the players in the game, is to advance a familiar "hero's journey" narrative, which emphasizes the hero learning skills through challenges with others to bring back and improve their community. The message is that performing the cognitive appraisals in-game can be transferrable to the player's offline situations as well. This design choice is in mimicry of *SPARX*, and the player progresses the plot with each appraisal submitted [11]. Figure 1 shows a mockup of the proposed game where a fantasy narrative with the



Figure 1: A mockup of the proposed serious game in a mobile format. The player has been tasked with taming monsters born from the negative thoughts of villagers by reframing the thoughts using the CBT process of cognitive appraisal. The narrative features the player visiting several kingdoms to save the world from the monsters. Sample text content borrowed from *Panoply*. Game sprites by Calciumtrice, usable under Creative Commons Attribution 3.0 license.

player travelling from kingdom to kingdom taming negative thoughts of others in the form of monsters is used.

Study Design

The study will randomize participants into either a group using the serious game we develop, or a point-based control based off *Panoply*. Differences in participant attributes such as SU status and pre-existing attitudes towards helping others will be controlled for as the engagement levels and change in attitudes for helping others are compared between the two groups. It is theorized that there will be higher engagement in the serious game group and change in attitude will be mediated by the engagement levels.

Engagement will be measured by user usage metrics, which include average length of words per appraisal submitted, number of sessions logged onto the platform, and time spent per log-in, and will be measured using *Google Analytics*.

To supplement the data, feedback of self-reported usability and user experience will be measured with the *System Usability Scale (SUS)*, the *User Experience Questionnaire (UEQ)*, and the *Net Promoter Score (NPS)*. The self-report data, will assess the efficacy of the platform as a mediator for attitude change. In addition, the users will do an introductory demographics survey, and an exit survey to reflect on the study's impact on their attitudes of P2P support and their identification with the avatar and narrative of the serious game using the *Narrative Transportability Scale (NTS)*. In a pre-test, post-test procedure to gauge attitude change, the *Helping Attitudes Scale (HAS)* will be used.

Participants will be recruited using Facebook ads, with persons working in a mental health care provider role excluded as well as those under 18 years old and those who cannot have daily access to a personal computer or mobile device for 3 weeks in a row. Participants will also have to be English speaking. Although the target population are NSUs, being an SU is not an exclusion criterion. Intake questions concerning one's relationship with health services and self-reported stress levels will be administered by taking questions from the *Perceived Stress Scale (PSS)*.

The participant will be using their personal devices and asked to use the study platform for 15 minutes a week for the 2-week duration of the study. Analytics for usage will be tracked for an extra third week to assess any interest in the platform outside of the prescribed study duration.

Implications

The applied implications of our study include guiding the development of more effective mental health services to address the inaccessibility problems of traditional F2F options. Results will offer design insights for cCBT tools to improve their user uptake, and to increase the appeal of contributing to P2P support groups for NSUs. By increasing the diversity in P2P support communities, efforts for reducing the stigma of seeking mental health support can be improved and CBT skills can be introduced to new audiences for preventing mood disorders such as anxiety. For scholarly implications, this study extends previous research on crowdsourcing P2P support, the influence of gamification techniques in motivation, and evaluates the Proteus Effect as a means of changing attitudes of helping others.

References

1. Ali, K., Farrer, L., Gulliver, A., & Griffiths, K. (2015, 5 19). Online Peer-to-Peer Support for Young People With Mental Health Problems: A Systematic Review. *JMIR mental health*, 2(2), e19.
2. Andersson, G. (2014). *The internet and CBT: a clinical guide*. Linköping, Sweden: CRC Press.
3. Barik, E. Murphy-Hill, T. & Zimmermann, T. "A perspective on blending programming environments and games: Beyond points, badges, and leaderboards," 2016 IEEE Symposium on Visual Languages and Human-Centric Computing (VL/HCC), Cambridge, 2016, pp. 134-142.
4. Bateman, D. R., Brady, E., Wilkerson, D., Yi, E.-H., Karanam, Y., & Callahan, C. M. (2017). Comparing Crowdsourcing and Friendsourcing: A Social Media-Based Feasibility Study to Support Alzheimer Disease Caregivers. *JMIR Research Protocols*, 6(4).
5. Bot-Hub. (2016, July 27). v KokoBot: comfort and help chatbot review. Retrieved from <https://bot-hub.com/reviews/comfort-and-help-chatbot-review>
6. Centre for Addiction and Mental Health. (2012). Cognitive-behavioural therapy (CBT). Centre for Addiction and Mental Health. Retrieved Feb 2, 2017 from https://www.camh.ca/en/hospital/health_information/a_z_mental_health_and_addiction_information/CBT/Pages/default.aspx
7. Goodwin, J., Cummins, J., Behan, L., & O'Brien, S. (2016). Development of a mental health smartphone app: perspectives of mental health service users. *J Mental Health*, 25(5): 434-440.
8. Hofmann, S., Asnaani, A., Vonk, I., Sawyer, A., & Fang, A. (2012, 10 1). The Efficacy of Cognitive Behavioural Therapy: A Review of Meta-analyses. *Cognitive therapy and research*. 36(5), 427-440.
9. Kaltenthaler, E., Parry, G., Beverley, C., & Ferriter, M. (2008). Computerised cognitive-behavioural therapy for depression: Systematic review. *Br J Psychiatry*. 193(3):181-4.
10. Mead, S., Hilton, D., Director, M., & Curtis, L. (2001). Peer Support: A Theoretical Perspective. *Psychiatr Rehabil J*. 25. 134-41.
11. Merry, S., Stasiak, K., Shepherd, M., Frampton, C., Fleming, T., & Lucassen, M. (2012). The effectiveness of SPARX, a computerised self help intervention for adolescents seeking help for depression: randomised controlled non-inferiority trial. *BMJ*, 344.
12. Morris, R. (2015). *Crowdsourcing Mental Health and Emotional Well-Being*. Massachusetts Institute of Technology.
13. Vatamanescu, E., & Ciceci, C. (2014). The Proteus Effect in the Context of Facebook Virtual Communities. *Strategica: Strategic Thinking in a Changing World*. 269-281.
14. Waller, R., Gilbody, S. (2009). Barriers to the uptake of computerised cognitive behavioural therapy: a systematic review of the quantitative and qualitative evidence. *Psychol Med*. 39(5):705-12.
15. Yee, N., & Bailenson, J. (2007). The Proteus Effect: The effect of transformed self-representation on behaviour. *Human Communication Research*.