Socialization of Veterans Using Virtual Reality

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Abstract. Real cognitive power comes from using external aids that enhance our cognitive activities; however, without such assistance, our memories, thoughts and reasonings are all constrained (Ware 2008). Exposure to trauma can cause damage to the area of the brain noted for value-based decision-making and can lead to a greater risk of mental health problems. However, evidence suggests that social support may provide a protective barrier on brain structure. A major factor in high suicide rate among military veterans is due to untreated mental illness. Unfortunately, there is a gap of service for veterans released from active duty and who are waiting to be treated by VA Medical Centers. Recently, there have been several press releases concerning the increase of suicide among veterans, and the inability of the VA to serve veterans in a timely manner. Numerous laws, blue ribbon commissions, Inspector General (IG) reports, Government Accountability reports, and hearings in both the Senate and House of Representatives Veterans' Affairs Committees are examining ways to fix this inefficiency (Heller et al. 2014; Ducharme 2018). The main objective of this research is to describe how players experience healthy socialization within virtual reality social environments using virtual ethnography and phenomenology. This exploration of healthy socialization using the emerging virtual reality social platforms may enable both positive socialization and positive emotional states (Stephane 2007 and Savage 2014) for both the short-term gap of service, and the long-term building of resilience.

Keywords: Military veterans · Socialization · Virtual reality · Resilience · Trauma · Suicide · Mental health · Post-traumatic stress disorder

1 Introduction

1.1 Gap of Service

Suicide is 10th leading cause of death in the United States, and worldwide suicide is high in countries like Lithuania, South Korea, and Japan (World Population Review 2019). The United States contains service gaps in that suicide prevention needs both reactive and proactive care (Aguirre et al. 2013); however, the focus is generally on reactive care in that a person would notify authorities only after someone threatens or attempts suicide. There are nearly 22 million veterans living in the United States, but only 5.9 million actually use VA health care services; therefore, 16 million veterans are not receiving health care benefits from the VA (Bagalman 2014). Many may depend on charity and local and state resources.

Several press releases have been issued over the last few years making military veteran suicide prevention and intervention top priority of the Department of Veteran Affairs (VA) (Shinseki 2012; VA 2018a, b). The most recent press release at the time of this research was January 2019 from Robert Wilkie, the Secretary of Veterans Affairs, stating that veteran mental health is the top clinical priority of the VA (Wilkie 2019). However, very little is mentioned concerning a proactive treatment for sustainable mental health for veterans. Secretary Robert Wilkie explained that the critical time for high-risk veterans happens during the 12-month period following their discharge from the military. The release discusses accountability and transparency of the VA as an approach to treating the problem - providing very little explanation of what is being done to actually support veterans during this critical 12-month period.

Early interventions like developing necessary socialization skills and maintaining healthy relationships are lacking, causing a gap in service in the care of those struggling with suicide ideation stateside and globally. Both proactive and reactive responses are vital components in creating early intervention methods through socialization and both can be developed by advancements in technology (Aguirre et al. 2013). Socializing with these advancements include virtual reality social environments (VRSE); for example, AltspaceVR.

AltspaceVR is a social platform in virtual reality that assists people from over 150 countries to socialize in the most natural way possible. The main objective of this research is to describe how Players experience healthy socialization within VRSE and two of the research goals: (1) help provide veterans with healthy socialization experiences, and (2) help build resilience in Players while they are waiting to be seen by a health care professional.

2 Design Thinking

The iterative and incremental design thinking (DT) approach (Meinel and Leifer 2011) is employed for identifying and mapping appropriate human-centered design methods for each stage, i.e. problem statement(s), need-finding, ideation, prototyping and evaluation. In particular, in the evaluation stage, objective phenomenology and virtual ethnography (Creswell 2018; Boellstroff 2012, 2015) are investigated in terms of best fit for eliciting and understanding each player's unique perspective and unique experience related to expected positive socialization in social VR platforms such as AltspaceVR.

Previous research focused on online social environments (e.g. Second Life) which showed that players enjoyed creating things in VR, but most of them used the online environment primarily for socializing (Brahnam 2014).

Furthermore, social support seems to have a protective effect on Orbitofrontal (OFG) volume in the brain for veterans exposed to trauma. Traumatic experiences are associated with reduced OFG volume; this region of the brain plays a role in object identification, learning of stimulus-reward associations and value-based decision-making. Reduced OFG volume may affect the ability to recognize the implications of stimuli; like rewarding stimuli (Aupperle, Connolly et al. 2013) in social interactions. Recognizing positive and negative stimuli from another person is important for developing and maintaining healthy relationships.

3   Methods

This article is based on my current PhD research.

The problem statement and need-finding DT stages are based upon previous research and personal experiences, and the related methods are literature reviews and observations.

During the DT ideation stage, the main methods employed were brainstorming sessions and design rationale for identifying the best VR structure to enable studying the experiences of healthy socialization. Initially the research focused on thoughtful facial expressions (Savage 2014) and the real-time animation of virtual avatars. Facial expressions play a powerful role in social interactions from birth to adulthood (Université de Genève 2017), however, after several iterations over the course of 2-years, it was decided to shift toward VR social environments that enabled observation of players and elicited larger scale multi-player socialization.

The DT prototyping stage was aligned with the ideation stage for assessing the usefulness and feasibility of a VR environment within the scope of the current research. Over the course of 2-years, 3D software enabled the animation in real-time of an avatar's face based on the player's facial expressions. Different software and hardware were identified and compared, and a first successful prototype was implemented using Brekel Kinect Pro Face. However, the overall configuration, even though ready for experiments, was found quite complex, constraining, and expensive from a sustainability perspective, i.e. if deployed at a large scale, every player would need to be provided with a Microsoft Kinect and a VR-ready computer, and players would need to constrain their movements within the field of view of the Kinect sensor. Furthermore, the real-time integration of the facial expression capture and animation with various existing games was also found to be complex and not sustainable (e.g. upgrades over time). Therefore, the recent social VR environments were finally selected as the preferred design for the current research. As mentioned above, the main research focus shifted from facial expressions to social interactions in the ideation stage, and the prototyping shifted from hard-coding to customizing activity spaces in these social VR environments and utilizing all the advanced features offered by such environments, both technical (i.e. multi-player, multiple VR headset support, cross-platform support - Windows, Mac, mobile devices) and social (i.e. subscription rules and 24/7 moderation).

By consequent, for the DT evaluation stage, using the virtual space AltspaceVR, I began attending events over an 8-month period starting in March 2018 in an effort to establish prior ethnography. Events within Altspace are ongoing sessions/events dealing with different forms of socialization while offering a myriad of activities. For example, one event is called "Mental Wellness: Real-Life Superheroes," where players learn practical applications concerning mental wellness; another example is an event called "VR Church," where Players explore spirituality and meditation. As my virtual relationships developed, I began to host my own events, and as a result the initial methodology shifted from ethnography to phenomenology, for studying emergent phenomena.

Participant population currently consists of four virtual reality players called a "transient" sample. It is recommended for phenomenology methodology to have 3–25 players or until saturation is reached on the chosen phenomenon (Creswell 2013 and Ary et al. 2010). Sample demographics include United States and United Kingdom. Limitations include (1) age: 18-years and older, and (2) English speaking. Recruitment strategies emerged during development and hosting of events, and while participating in other events and activities for the purposes of recruitment, observation, and interviewing of players relating to healthy socialization within virtual reality.

Data collection consists of interviews and observations where a player signs a consent form agreeing to be observed and interviewed. After 8-months of player observation, an interview was set up with each of the chosen players in the transient sample. The University Institutional Review Board reviewed and approved the study in January 2019. Interviews were conducted in February 2019 and lasted roughly 30–45 min. They were completed by calling the player using the Discord voice and text chat application for gamers, and the interviews were recorded using OBS Studio.

3.1   Trustworthiness

Credibility (Creswell 2013) was addressed using different techniques such as prolonged engagement in the field (currently a total of 1-year from March 2018 – March 2019), member-checking, and triangulation of methods and data sources; both ethnographic methodology and phenomenology were used, and both observation of players in their natural virtual environment and interviewing players for confluence of evidence (2013).

Player interviews were coded using inter-rater and intra-rater (code-recode) validation to help confirm reliability. I started with the first interview from Player 1 and coded a page with higher level emergent themes. Some of these themes were: Safety, Silliness, Engaging, Privacy, Comfortability, and Real-World Likeness. After two weeks, I returned to the same section of the interview and recoded it again. I chose the same or similar codes. For example, 'Engaging' was the initial code used during the first time through, while 'Interesting' was used during the recode. After my second time through, I utilized inter-rater agreement and sent the interview and coded themes to another researcher who confirmed and agreed with my decisions. Additional considerations for dealing with trustworthiness will be addressed as this research is conducted and completed.

4   Results

Data reduction has been conducted throughout the process for observations of players in their natural virtual environment and during each interview. Data analysis is still in its early stages but there are already some very interesting findings. For example, preliminary research has already suggested that socializing in VR while discussing mental wellness has been extremely beneficial to real-world applications, and socializing through entertainment has impact in Real-World Likeness. Player 4 even stated that he/she finally felt the courage to seek counseling for extreme social anxiety.

Player 1 (P1) recently went through a major surgery and had been homebound for several weeks. For P1 the friendships that he/she developed within VR were similar to Real-World Likeness.

P1: "The more you're there and interact with the same people, you kind of bond with them a little bit and your comfort level is much better, you know, and that's how it works in the real world too".

5 Discussion and Recommendations

Qualitative research allows studying emergent properties. One of these emergent properties is what I have termed '*Transient*' sample unique to VR users. In this sample, each player is considered from both the virtual reality and the real reality standpoint; in terms of their chosen avatar (and name) representative of their unique character within VR, and in terms of the actual human in real reality. The transient sample represents:

(1) Randomness of and among the players within these virtual environments; they cross time zones, cultural, religious, and moral zones;
(2) Accessible within reason; they must also be receptive to the researcher's questions in and out of VR;
(3) Typical; (versus representative) differing in players already using VR verses willing-to-use VR technology (this is also a usability issue);
(4) Indiscriminate and genial (hospitable) for at-the-moment participation in both virtual and real world;
(5) Present and Settled (PAS): sticking around instead of event hopping. When asked a set of questions, some participants would just "pop-out" of the event and/or exit the game. There are three aspects to PAS - first, they do not wish their actual world identities to be compromised; second, they are having technical issues causing misunderstanding or making it difficult to connect and respond; third, they do not like the event (regardless of the researcher) and are unwilling to stay further;
(6) Constancy (or loyalty) to a particular environment (AltspaceVR), spaces (events or areas of interest), or avatars (other players). A player's fidelity to their chosen event, game, environment, etc. can be fiercely loyal or intensely duplicitous.

A research study was conducted on veterans (Savage 2015) using a video game called Suicide Intervention-Prevention Mini-Game (SIP-M). This video game was designed to teach players about mental wellness while distracting them through interactive entertainment (running around in third-person searching a warehouse for clues), and through gaming challenges (time constraints and time warnings). By distracting players with these gaming features, players would be inadvertently educated on suicide intervention-prevention. The results were that eventually all Users showed improvement in learning about suicide intervention-prevention or scored exactly the same. However, only one User scored worse during the initial attempt to play because they were unaccustomed to playing video games. When the User immediately played the game a second time, the User showed substantial improvement in learning the facts about suicide-intervention prevention.

This study is important because information can be lost when there are technology malfunctions and misunderstandings concerning how to use or how to engage in a virtual reality environment. This is another reason why players in virtual reality are such a unique sample and interesting sample. One player could be using a Smartphone to attend events, another might use a PC, or they may be using one of several types of VR headsets on the market.

5.1   Future Direction

A poll was conducted by The Washington Post and Kaiser Family Foundation (2015) among a random national sample of 819 Iraq and Afghanistan war veterans. This poll revealed that 55% of those surveyed felt disconnected from civilian life and two-thirds missed the community of other solders. The poll showed that 51% personally knew a service member who had attempted or who had actually committed suicide. Finally, 51% believed the military nor the government are doing enough to help veterans transition.

My research efforts toward providing healthy ways of socializing through social VR environments and entertainment are supported at this stage by positive observations in the social VR platforms as well as positive feedback from players. Therefore, it is expected that continuing to create adapted activity spaces in these VR platforms as well as providing insights and guidance for meaningful socialization will contribute to a better veteran transition.

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