Mixed Feelings and Realities: Joyful to Nauseating Sentiments about VR on Twitter

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INTRODUCTION
Virtual reality (VR) is pushing the technological and cultural limits of digital games. For instance, engineers are working with high-end controllers, hand-tracking, and display technology to augment the VR experience. VR has targeted remote work and the metaverse. VR has many skeptics. Cix Liv (2021), a VR pioneer, stated, "Sorry to my VR friends. I declare PC VR, dead. Prove me wrong." Still, little research has examined how users feel and express the limits of VR and play. Our research analyzes tweets for the public perception of the affordances and limitations of VR through its emotional impact on users.

INTERACTIVITY, PRESENCE, AND EMOTION

Prognostications about VR's demise and excitement about its potential underly how users express both positive and negative emotions online about this new technology. VR differs from traditional digital games in many ways, for example, offering higher levels of interactivity, or the degree to which users reciprocally communicate or engage within a medium (Kiousis, 2002), which evokes emotional proprioception (Tamboroni & Bowman, 2009). Interactivity in VR also encourages users to map real-world experiences to virtual mental imagery (Mohd & Awang, 2012) and experience a sense of presence, or "being there" (Biocca, 1997; Grigorovici, 2003) in the virtual environment. Such experiences of interactivity and presence are emotionally arousing (Lee, 2004; Huang & Alessi, 1999), potentially in both the positive direction (e.g., when virtual experiences are enjoyable) and the negative direction (e.g., when jarring). Also, given the nascency of this technology, software and hardware limitations may evoke negative emotions due to disappointment or perceived redundancy (Martínez-Tejada et al., 2020). Hence, it should be no surprise that people publicly share and discuss their experiences in VR. Inspired by this notion, we pose the following research questions.

1. What emotions are commonly expressed in tweets about VR and Play?

2. What positive and negative themes emerge from popular emotions expressed about VR and Play?

METHODS

This study utilizes the Academic Research tract of the Twitter API. This Twitter API provides access to historical tweets. We pulled all 2021 "VR" and "play" tweets. We next filtered for first-person singular pronouns. The tweets were coded for emotion according to the NRC, a sentiment and lexicon dictionary created by the National Research Council of Canada. NRC has two sentiments (i.e., positive and negative) and eight emotions: Anticipation, anger, disgust, fear, joy, sadness, surprise, and trust. Our study identifies the most expressed emotions from the tweets and then analyzes them using those terms.

This study also separates the more positive and negative tweets expressing these emotions to check for variance. To fully address the second research question, we are pairing the identification of tweets according to their emotions and conducting inductive thematic analysis. Analysis involves taking the pre-partitioned tweets and then qualitatively coding them according to the emergent concepts associated. This additional analysis stage will allow us to identify specific affordances and limitations.

PRELIMINARY RESULTS

We collected 100,363 tweets from 2021 (see Figure 1). We then filtered for personal declarations (i.e., first-person pronouns) ($N = 27,271$). Analyses first scored the individual tweets for the frequency of each of the eight emotions (see Figure 2). We conducted an ANOVA analysis on the eight emotions.

We sorted the eight emotions according to their means, and then we conducted a TukeyHSD to identify gaps along the hierarchy. As such, anticipation was significantly higher than trust ($MD = 0.089$, $p < .001$). Though the next pair—joy and trust—did not statistically differ, trust and fear statistically differed ($MD = 0.068$, $p < .001$). The top three expressed emotions were anticipation, joy, and trust. These emotions next received further analysis using qualitative content analysis. We examined subsections of our corpora for the second research question based on the three emotions: anticipation (13660 tweets), joy (10738 tweets), and trust (11121 tweets).
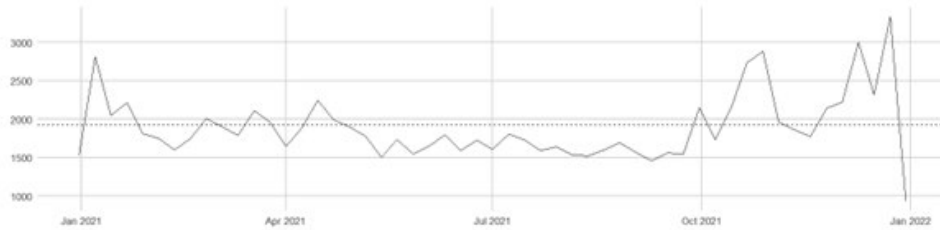
Figure 1: Frequency of tweets referencing VR and play from 2021.

When drilling down into each theme qualitatively, each of the major emotions saw positive associations that came from the use of game content counterbalanced by the limits of the technology. Anticipation was tied to both immediate and future anticipation surrounding VR, with users expressing they could not "wait to start streaming some games[. I'm] honestly excited to play again tomorrow." This anticipation was counterbalanced, however, against physical limitations, derived from cybersickness and other physical limitations present in the technology. Similarly, joy was tied to engagement with games, as one user wrote, "I was in the mindset that VR was still pretty much just a gimmick but really wanted to play Half Life Alyx and check out how Star Wars Squadrons." However, once again that joy was mitigated by "... feeling nauseous as hell [...] motion sickness." Similar issues surrounded trust in the technology, where everything from motion sickness to finding ways to easily stream the technology was considered a "huge pain" and led to users claiming to "forget VR" altogether.

DISCUSSION AND FUTURE WORK

Preliminary findings point to a few key factors when it comes to users' emotional responses to VR: First, the quantitative analysis suggests that users mostly felt positive about VR, with strong hope and anticipation for its future use. We aim to further analyze the tweets to construct a comprehensive typology around common themes. Positive expressions were associated with the gaming content. Users felt joy and trust when it came to the titles and games that they liked. VR appeared to augment or create exciting new possibilities for play. Furthermore, VR can support positive social interactions such as collaborations and learning in a way to overcome the shortcomings of the present virtual meeting technologies (i.e., videoconferencing meetings).

However, this love of content was not necessarily connected to use. Players expressed concerns about nausea and motion sickness. It was precisely when technology broke down, causing motion sickness, etc. that users seemed to be hindered from experiencing presence, interactivity, and the sense of immersion. Security is also a critical concern that should be addressed in VR for future use. Despite the potential for VR to move beyond the gaming experience, traditional gaming content seems to actually determine the limits of VR enjoyment and emotional responses.
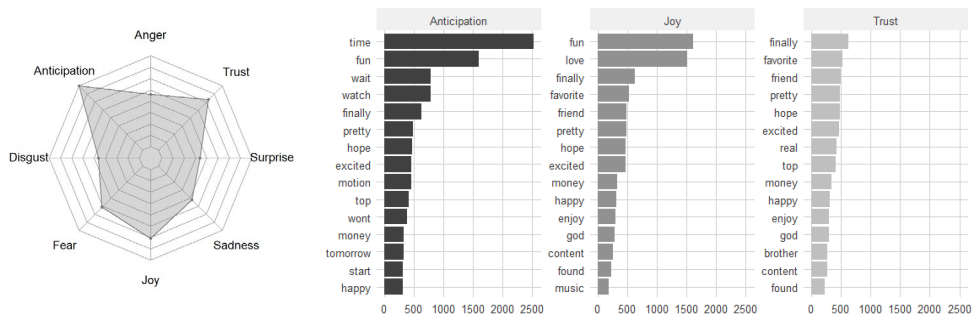

Figure 2. Emotion word distribution and most common words from top three

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