Impact of Fake News in VR compared to Fake News on Social Media, a pilot study

Adrien Verhulst*
The University of Tokyo

Wanqi Zhao†
The Australian National University

Fumihiko Nakamura‡
Keio University

Masaaki Fukuoka§
Keio University

Maki Sugimoto¶
Keio University

Masahiko Inami‖
The University of Tokyo

Abstract

With the rise of easily shareable online information, fake news have become a pressing issue in our societies. News credibility depends of several factors (reliance on a source of information, media outlet, etc.). We investigate here the *immersion* factor by comparing in a pilot study (N=6) the impact of fake news in VR (with a 360 degrees video), and fake news on social media (2D videos).

Index Terms: Human-centered computing—Human computer interaction (HCI)—Interaction paradigms—Virtual reality

1 Introduction

A new future for journalism is emerging with the development of 360 cameras. Recent works have already explored the possibility of VR journalism, with VR headset displaying 360 videos [3, 4]. But as VR journalism develops, the increase in immersion might also change the impact of fake news. Our work is a preliminary study to investigate the impact of fake news in VR compared to fake news on social media.

Sundar et al. [5] highlighted several heuristics for news credibility, among which: "presence" and "being-there"; hinting that VR (with a good presence) might increase news credibility. Yet, Lee et al. [3] found that there was no significant differences in news credibility in groups with different level of presence. Lee et al. compared (N=80): a 2D video (displayed on a smartphone); a 360 video (displayed on a smartphone); and a VR video (i.e. a 360 video, displayed in a HMD). Similarly, Waltermine [6] found no significant difference in story credibility in groups with different level of immersion. Waltermine compared (N=137) a 2D photo and VR photo (i.e. a 360 photo, displayed in a HMD).

Even if the current state of research shows that a VR 360 video has no more impact on news credibility than a 2D video, it seems counter intuitive, and likely require more research to better understand the mechanisms behind it. We propose in this pilot study another comparison point, by comparing *fake* news credibility. Unlike previous work, we also developed a Virtual Environment (VE) (by providing videos selection and interaction), to increase the immersion.

2 Setup

We developed the *Fake It - VR* application with Unity 2018, and we deployed it on a laptop able to run it smoothly. The user's head and hands were tracked with the Vive Pro[1] and the Vive Pro controllers. We also "developed" *Fake It - Non VR*, its "social media" counterpart, on a private Reddit[2] channel to present the videos, and we used a private Youtube[3] channel to host them.

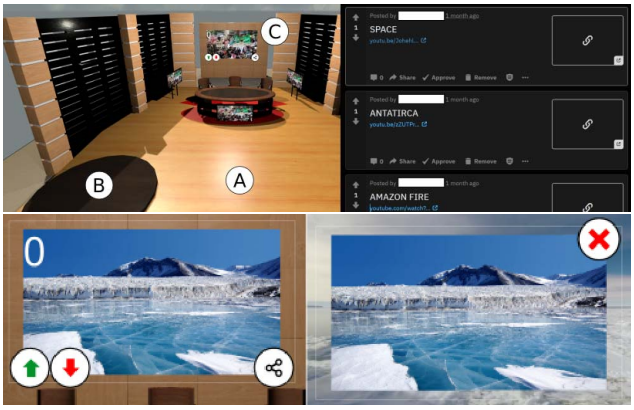

Figure 1: From top to bottom and left to right: The scene in VE; The Reddit forum (we hid the username); The main screen in selection mode; The main screen in video mode.

3 The Fake It - VR Virtual Environment

There are 2 "modes" in the VE: ◯ (I) **The selection mode**. In this mode the VE is a news studio (c.f. Fig. 1). The user starts at the point A, and is only able to teleport between the A and B point (by pushing a button on the left controller). The main screen (c.f. Fig. 1), at the point C, displays a preview picture of the *news*. To watch a news, the user has to select it with a virtual pointer (casts from the right controller) at the main screen and by pressing a button on right controller[4]. ◯ (II) **The video mode**. In this mode the VE is only a main screen (c.f. Fig. 1) and a promontory. The 360 video replaces the skybox and is automatically played (it cannot be paused nor stopped). The buttons on the main screen are hidden, except for the exit cross, To "exit the news" and going back to the selection mode, the user have to select the exit cross.

We did not want the participant to move freely in the space (it was not necessary, and we did not want the participant to move during the 360 video), hence the limited teleportation points. In the video mode, every 3D elements, at the exception of the small promontory, is invisible. Some users preferred to stand on something (here the

*e-mail: adrienverhulst@star.rcast.u-tokyo.ac.jp
†e-mail: wanqi.zhao@anu.edu.au
‡e-mail: f.nakamura@imlab.ics.keio.ac.jp
§e-mail: f.masaaki@imlab.ics.keio.ac.jp
¶e-mail: maki.sugimoto@keio.jp
‖e-mail: inami@star.rcast.u-tokyo.ac.jp

[1] https://www.vive.com/fr/product/vive-pro/
[2] https://www.reddit.com/
[3] https://www.youtube.com
[4] The user is also able to interact with the main screen by selecting the upvote arrow (if he/she enjoyed the news) or the downvote arrow (if he/she did not enjoy the news). However despite the instructions, almost no participants used them.

978-1-7281-6532-5/20/$31.00 ©2020 IEEE
DOI 10.1109/VRW50115.2020.0-136

promontory, at the point B), others preferred to stand in the air (at the point A).

4 The Fake It - Non VR Internet Environment

We are using a Reddit private channel (c.f. Fig. 1) containing 5 threads (one for each news). There is no comments in any thread, nor upvote / downvote. To watch a news, the user clicks on a thread, and is redirected to a Youtube private channel to watch it. There is no comment nor upvote on the Youtube page either.

5 The Fake News

At the best of our knowledge, there is no 360 videos with fake news readily available. We therefore created our owns, using 5 actuality topics that our participants were likely aware of: US presidential election; Kyoto mass tourism; Amazon forest fires; global warming; and space militarization. For each topic: (A) We took a well written article from a news website, and modified 25% to 50% of its content. Then, we recited and recorded the modified article with a "neutral anchor man voice"; (B) We downloaded a 360 degrees video (e.g. a forest fire 360 video for the Amazon forest fires; a Antarctica 360 video for the global warming; etc.) and trimmed it down to +/- 2 minutes (about the same duration than the median length of Youtube most popular videos [2]). If necessary, we removed the original audio, and then added the audio record of the modified article (with ffmpeg[5]).

5.1 Task Design

We used 2 groups with a between subject design. The **VR group** only watched the fake news in VR, and the **Internet group** only watched the fake news on Reddit. The protocol was the same in each group: ◯ (I) The experimenter explained the *how-to* and instructed the participant to sit and watch the videos 1 by 1, with a 3 minutes break in between (the order was changed between participant). After each video, the participant answered the Task questionnaire (c.f. Tab 1, the VR group had to remove the HMD every time to answer it); ◯ (II) After watching all the videos, the participant answered a profile questionnaire, a media consumption questionnaire (inspired from [1]) and some open questions (e.g. what did you think about the experiment, etc.); ◯ (III) The experimenter explained the purpose of the experiment, and presented every changes made in the news, so the participant could acknowledge he/she understood what was fake.

ID	Item
Q1	What is your bias regarding the topic of this report coverage?
Q2	What is your expertise regarding the topic of this report coverage?
Q3	Did you like the report coverage?
Q4	Did you learn something in the report coverage?
Q6	How much credibility would you give to the report coverage?
Q7	Would you like to see more report coverage like this one?
Q9	How much bias would you give to the report coverage ?
Q10	Do you believe the report coverage was fair?
Q11	Do you believe the report coverage was beneficial to someone/something?
Q13	Do you believe the report coverage was critical to someone/something?

Table 1: The Task questionnaire (used for every topic).

[5]https://www.ffmpeg.org/

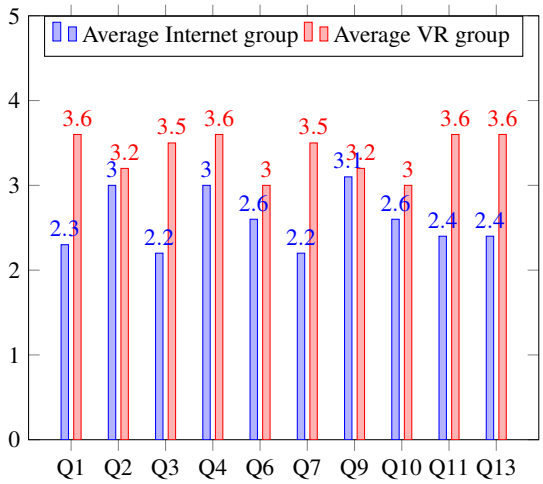

Figure 2: The scores average of the Task questionnaire.

6 Results

We had 6 participants, 3 for each groups. This is too little to do any statistical analysis, however we observed the following tendencies: ◯ Overall the participants did not have a lot of bias across the topics (across all videos, there was 30% of little bias and 37% of neither little nor a lot of bias) and had more than no expertise of the topics (across all videos, there was 20% of little expertise, 27% of neither little nor a lot of expertise, and 37% of some expertise); ◯ We observed the average score of the news of the VR group and of the news of the Internet group. The VR group liked the videos more and wanted to see others more (c.f. items Q3 and Q7). The VR group had slightly more trust, fairness but also bias (c.f. items Q6, Q9 and Q10); paradoxically, it was also more cautious (c.f. items Q11 and Q13).

7 Conclusion

This preliminary study gives us some exploratory tracks to study this subject in more details. It is possible that VR fake news are more trustworthy than their internet counterpart, yet the users are also possibly more cautious when watching them. However more observations are needed to draw any definite conclusions. Moreover we would like to make "better" fake news and to extend our work to fake comments.

References

[1] NSE media consumption behaviour. `https://www.research.net/r/interestmedia`. Accessed: 2019-05-01.

[2] Video Length by pew research center: Journalism and media staff. `https://www.journalism.org/2012/07/16/video-length/`. Accessed: 2019-05-01.

[3] S. Kang, E. O'Brien, A. Villarreal, W. Lee, and C. Mahood. Immersive Journalism and Telepresence. *Digital Journalism*, 7(2):294–313, feb 2019. doi: 10.1080/21670811.2018.1504624

[4] E. Sirkkunen, H. Väätäjä, T. Uskali, and P. P. Rezaei. Journalism in virtual reality. pp. 297–303, 2016. doi: 10.1145/2994310.2994353

[5] S. Sundar. The main model : A heuristic approach to understanding technology effects on credibility. 2007.

[6] B. WALTERMIRE. *VIRTUAL REALITY AND ITS IMPACT ON TRAVEL JOURNALISM AUDIENCES: A STUDY OF PRESENCE, CREDIBILITY, AND DESTINATION IMAGE THAT CAN INFLUENCE VR USER ATTITUDES ABOUT A TRAVEL DESTINATION*. PhD thesis, THE GAYLORD COLLEGE OF JOURNALISM AND MASS COMMUNICATION, 2019. unpublished thesis.