First-Person Narratives: Examining Narrative Persuasion in Virtual Reality

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INTRODUCTION
This study explores the potential of a commercial virtual reality (VR) nature-based game to serve as a vehicle for pro-environmental narrative persuasion. Narrative persuasion is a field dedicated to studying and harnessing the persuasive power of stories to disseminate messages (Bilandzic and Busselle 2013). The study of narrative persuasion is important because it is capable of inciting strong attitudinal and behavioral change (Bilandzic and Busselle 2013, Bandura 2004). Narrative persuasion has also been examined across a multitude of technological contexts, such as books, television programs, and games (Moyer-Gusé, Chung, and Jain 2011, Strange 2002, de la Hera Conde-Pumpido 2013, Wright and Bogost 2007).

While the results of these studies have been promising, empirically validated mechanisms related to narrative persuasion have not yet been systematically applied to practice (Sundar et al. 2013). Furthermore, there are still lingering questions regarding the mechanism behind the impacts of VR-based persuasion (Ahn et al. 2015). In particular, there is a need to better understand the dimensions and roles of first-person narratives and interactivity effects (Ahn, Bailenson, and Park 2014, Ahn et al. 2015, Peng, Lee, and Heeter 2010, Christy and Fox 2016). Therefore, this study examined the importance of narrative interactivity and transportation, which are two potential strengths of VR gaming (i.e., digital gaming experiences mediated through a head mounted display).

LITERATURE REVIEW
Definitions and conceptualizations of narrative interactivity change based on the medium in question (Green and Jenkins 2014). Some scholars have examined narrative interactivity as a technological affordance (i.e., functional features of a medium such as hyperlinks) while others have examined it as an affordance of content (i.e., features that allow users to decide the direction of a narrative such as "Choose Your Own Adventure" books) (Sundar, Kalyanaraman, and Brown 2003, Green and Jenkins 2014). Interactivity in the context of VR is defined here as the users' perception that they can modify the "form and content of a mediated environment" (Steuer 1992, 14). One of the contributions of this study is that it examines narrative interactivity as a multidimensional concept across both conceptualizations (i.e., both a technological and content related affordance).

Being transported into a narrative is a psychological state of becoming emotionally and cognitively involved in a story (Green and Jenkins 2014). For instance, most of us have experienced becoming engrossed and engaged (i.e., transported) into a good book,

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movie, or video game. Narrative transportation is an important factor that has been shown to contribute to narrative persuasion (Busselle and Bilandzic 2009, Appel and Richter 2010, Murphy et al. 2011). Immersive and interactive experiences such as those provided by video games have been found to increase narrative transportation or other similar constructs (Sundar et al. 2013, Gorini et al. 2011). Furthermore, immersive VR has been positively associated with narrative engagement, which is a similar concept (Ball 2018).

METHODOLOGY

The experiment and results presented in this study were derived from a larger dissertation study. The experiment was a between-subjects factorial design, a 2 (high and low narrative interactivity) X 3 (low, medium, and high natural mapping) factorial design. In total, 173 undergraduate college students in the United States participated in the study. Participants spent approximately 10 minutes playing the game *Nature Treks VR* (Carline 2017). Nature Treks VR is a nature-based VR experience created for the HTC Vive and Oculus Rift that allows users to freely explore natural environments and observe various wildlife. Roughly half of the participants were given the ability to alter the virtual environment in positive ways in the context of a pro-environmental narrative. For example, those in the interactivity condition could grow plants for the animals (i.e., trees, bushes, grass) while those in the non-interactive condition could not.

RESULTS

Two independent samples t-tests were found statistically significant differences between technical interactivity ($t(171) = 9.50$, $p < .001$) and content interactivity ($t(171) = 5.90$, $p < .000$) across high and low conditions. Specifically, those in the interactive condition reported greater perceived technological interactivity and greater perceived content interactivity. Therefore, VR is capable of instilling feelings of narrative interactivity across both dimensions.

An OLS regression was used to examine the relationship between narrative interactivity and the outcome variable narrative transportation. The two dimensions of narrative interactivity had different impacts on the formation of narrative transportation. Specifically, perceived content interactivity was positively associated with narrative transportation ($\beta = .432$, $p < .000$) while perceived technical interactivity was not ($\beta = -0.103$, $p = .237$).

A series of PROCESS path-analyses were also conducted to explore the potential mediating relationship between narrative transportation and the pro-environmental outcome variables. This study found that narrative transportation was a complete mediator of the relationship between perceived content interactivity and participants' elephant attitudes ($B = 0.147$, $p < .001$), general environmental attitudes ($B = 0.059$, $p = .014$), and activism intentions ($B = 0.228$, $p < .001$).

DISCUSSION

This study builds and expands upon the VR persuasion literature by successfully exploring some of the mechanisms that help to explain VR game effects. Specifically, this study contributes to the literature surrounding narrative persuasion in two ways. The narrative persuasion literature typically examines the persuasive effects of narratives in media contexts such as books, television, and digital games (Moyer-Gusé, Chung, and Jain 2011, Strange 2002, Wright and Bogost 2007, de la Hera Conde-Pumpido 2013). This study expands our understanding of narrative persuasion by examining first-person narrative persuasion in the context of a VR game. In particular, this study establishes the importance of narrative interactivity as a contributing factor

of persuasion in VR (Sundar, Kalyanaraman, and Brown 2003, Green and Jenkins 2014).

The results presented here also demonstrate the importance of conceptualizing narrative interactivity as a multi-dimensional construct in which it is both an affordance of technology and content (Steuer 1992). In other words, in VR, narrative interactivity is both the perceived ability to alter the world (i.e., technical) as well as the perceived ability to impact the story (i.e., content). In this case, the ability to impact the story was found to be the most significant dimension when fostering narrative transportation and persuasion.

CONCLUSION

Narrative interactivity impacted participants' feelings of narrative transportation, and ultimately, their pro-environmental attitudes and behavioral intentions. Building off previous literature, the present study takes important steps towards crafting a new conceptual framework that improves our theoretical understanding of narrative persuasion in VR. These findings are encouraging, as they demonstrate the potential for VR to effectively persuade players via positive first-person narratives.

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