THESIS

VIRTUAL REALITY AND NEWS AUDIENCES:

EMPATHY OR MORE?

Submitted by

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ABSTRACT

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In this master's thesis, I analyzed the following question: "Does VR journalism increase empathy or prosocial behavior in news audiences?" In doing so, I also balanced considerations of other modifiers of prosocial behavior. Multiple pre-test orientations were measured via the Toronto Empathy Questionnaire, the Five Factor Model of Personality, and the Ideological Consistency Scale. Then, participants were asked to watch or read *The New York Times* documentary "The Displaced" in three randomly assigned conditions: via a head-mounted display (HMD) Oculus Go device, using a computer mouse to click around in the YouTube 360-degree video, and via print from *The New York Times Magazine*. After watching or reading "The Displaced," participants were given the SUS Presence Questionnaire which measures immersion as well as the helping behaviors scale. Results showed no strong relationship between VR journalism and empathy or helping behavior in news audiences, in contrast to previous studies, however there was a strong relationship between level of immersion and story medium. There was also a strong relationship between personality disposition, empathetic capacity, and political ideology with participants' willingness to help those affected by the refugee crisis. I discuss both the ramifications of this study for newsroom practices and future research of immersive media.

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LITERATURE REVIEW

In the past decade, there was a rush in the journalism industry to tell stories using the medium of virtual reality (VR) that came on the heels of innovations in 360-degree video, and although there's evidence now that there's been a bit of cool-off in the industry, a CB Information Services report found that from 2014 to 2017, large media companies such as Comcast and The New York Times Company made over 100 VR business deals and that funding for VR related projects was increased year-over-year since 2012 (CB Insights, 2017, p. 3-4). As Nausicaa Renner noted in a 2017 Columbia Journalism Review article: "The future is now with VR journalism. Some of the best and brightest in journalism are using virtual reality to plunge audiences into the midst of stories" (Renner, 2017, para. 1). Another 2014 article from the same journal went so far as to declare virtual reality the new frontier of journalism in its headline, later noting: "This work is also providing valuable, vital public services with remarkable emotional punch" (Polgreen, 2014, para. 3). Another 2017 study by journalists at the Associated Press in tandem with Multimer at MIT found participants had higher levels of engagement in "room-scale VR," where "people walk through scenes and touch 3D objects, as opposed to passively consuming multimedia content on devices without the ability to interact" (Marconi & Nakagawa, 2017, para. 3).

These sentiments and study findings indicated what was at the time a growing phenomenon of journalists and media practitioners who viewed VR as the way forward for journalism, and some even viewed VR as a method to get news audiences to empathize and engage with the people in news stories. This optimism in media toward VR was perhaps best characterized by the decision of *The New York Times* to include Google Cardboard devices (a small and cheaply made mass-market head-mounted display (HMD) meant to be constructed by

users out of cardboard as an attachment to smartphones) in editions of *The Times* in November of 2015, and again a year later in December 2016 (Robertson, 2015, para. 1-3, Robertson, 2016, para. 2). In November of 2015, the total number of Google Cardboard devices distributed to New York Times subscribers was 1.3 million (Knight Foundation VR Report, 2016, p. 8). This decision was calculated; it corresponded with the release of the VR documentary, "The Displaced." Google Cardboard was used to give subscribers a new way to engage with these new styles of video with an eye towards one project by *The Times*, "The Daily 360," a recurring installment, with an accompanying app that made use of VR videos in one story each day of the year (Robertson, 2015, para. 2).

Since virtual reality journalism had gained steam during this time, it was increasingly being utilized and produced by journalists in the field and as such VR had garnered many proponents. One 2015 article published in *Pacific Standard* asserted that virtual reality could be considered "a portal to a more compelling storyland than any other medium can offer" and "a potential empathy bridge" (Nuwer, 2015, para. 21). But even as industry experts like Robert Hernandez, a digital journalism professor at USC Annenberg embraced VR as a new form of communication with wonderful empathy-giving qualities (Edge, 2015, para. 25) the scientific body of work pertaining to the technology's application to journalism at the time was lacking. Existing scientific literature connecting the concept of empathy to mass media and communication studies was sparse. It's worth noting that even today as the industry experiences a shift in priorities from VR, academic studies on VR, in general, are still under development. One reason for this is because the technology is still so new as noted in *The Guardian* article "Long-term effects of virtual reality use need more research, say scientists" (Davis, 2016, para. 6). At the time that I began my master's program, I felt that this lack of research on the topic was

a missed opportunity within the field of media research, not only as I observed what at the time seemed like mounting pressure on journalists to make use of VR technology in the field but also because I theorized that the VR boom in media was tapping into some deep desire of many journalists. Impactful, meaningful journalism, many industry professionals argue, has a great deal to do with the empathy that audiences are capable of feeling towards a news subject (Biu, 2018, para. 5).

> At the core of the virtual reality deception is the concept of empathy. The notion that virtual reality is an "empathy machine" is pervasive in the breathless marketing of the booming VR industry, and it is one that has excited journalists. The core premise is that feeling that one has experienced something will make a user care more deeply about it (Owen, 2016, para. 25).

Even now, companies selling VR still continue to market the technology as an empathy generating machine, despite a lack of academic evidence for the truthfulness of these claims. An example of this broad swing in advertisement for the technology is characterized well in an Oculus blog post, which makes the claim "VR is unmatched in its ability to show you the world from someone else's perspective" (Oculus Blog & Kantor, 2018, para. 1). But as the industry rushed in and then recoiled from this emerging technology, the question became: where does VR leave journalism? Was it the empathy facilitating wonder that marketers, journalists, and technology enthusiasts alike often lauded it to be? Was it just a fad?

In this thesis, after examining the body of scientific literature relevant to my research questions and hypotheses, explicating empathy, conducting a brief pilot study to contextualize attitudes towards VR technology and adoption, and designing and conducting an experiment, I attempted to take a full-scale view of the current state of VR technology in the journalism industry and analyzed some of the media effects VR has on news audiences. My thesis experiment was designed to assess if there was a statistically significant difference in

participants' level of empathy, or prosocial behaviors towards those affected by the refugee crisis depending on whether or not they viewed the content of "The Displaced" from *The New York Times* in VR. Additionally, because discussion on media effects should always be framed with a degree of nuance in mass communications research, this study made an attempt to consider outside factors on prosocial behavior such as personality disposition, overall empathetic capacity, and political ideology as possible mediators that could explain why people reacted to "The Displaced" the way they did during my experiment.

Virtual reality journalism

What is virtual reality within the context of journalism? As a technology, VR has been adopted by a variety of fields, however, when talking about virtual reality, the first industry that may come to mind for consumers is gaming and entertainment. A 2017 report on augmented reality (AR) and VR found that 59% of participants identified as potential customers or investors for AR/VR listed gaming as "the sector expected to attract the most AR/VR related investment over the next 12 months" ("2018 Augmented and Virtual Reality Survey," 2018 p. 3, p. 15). Additionally, a 2018 Statista report projected that "the global VR gaming market size in 2016 will be worth 3.6 billion U.S. dollars. This number is expected to grow to 22.9 billion by the end of 2020" (Statista Research Department, 2018). And while it is true that the gaming industry has made use of VR technology as the medium for a new genre of games, it is also true that VR technology is being adopted in a variety of other contexts. As an example, VR is currently being used to create training programs for surgeons in the field of medicine (Wuryandari & Hindersah, 2011, p. 1-6) to tour houses for sale in real estate such as with ventures like Transported "Virtual Reality for Real Estate," (2017) and to treat patients with issues like eating disorders in the field of psychology (Riva et al., 2016, p. 10). Like these other industries, the field of journalism is

exploring the possibilities of VR technology. Notably, journalists have employed VR video as a means of storytelling. For this thesis, I will further explicate the term VR journalism at an operational level, but first, it's pertinent to talk about how VR videos work.

An in-depth explanation of VR technology from Paul Sarconi in the *Wired* article "How to shoot a 360 video" helps to contextualize how shooting and editing video in VR works. Most VR videos in journalism are shot using a 360 4K video camera. The lenses on these cameras are designed to give a panoramic view that spans the entire width of a full circle motion, hence the name 360, after the 360-degree angle used to turn in a circle. Higher quality VR video cameras are omnidirectional, meaning that two fisheye lenses capture video of everything surrounding them as opposed to a cut-up portion of the field of view. Other cameras shoot VR video by using a variety of camera lenses stationed at various angles with a little overlap capturing a field of motion that can be edited together to look like one, large circular panoramic view. All 360 4K video cameras create footage that must be edited together to look cohesive as a full panoramic shot.

In video production, VR video footage must be overlapped and placed together using editing (a process referred to as stitching). Once a video has been stitched together and published online, users have the simulated effect of looking around in a scene. This is best achieved using a head-mounted display such as the Oculus Rift, the Vive, or the Samsung Gear VR (to name a few), where audiences may turn their head to look in a certain direction. As a user looks around, HMD hardware is designed to respond to the motion in real-time by showing this portion of the lens view, as if the user is present in the scene and looking in the direction of what they are seeing. However, a similar effect of looking around can also be achieved in VR videos using input devices such as a computer mouse or a phone touchscreen to click and drag the camera

view, or by tilting a phone to change view essentially achieving the same function as moving your head in an HMD manually by dragging in the direction one might want to look. For the purpose of this thesis, VR videos that use touch input as opposed to input from HMD are referred to as click-through VR.

Put simply, the term VR journalism used throughout this thesis refers to any video news package or accompaniment to a news story that makes use of the aforementioned VR video technology to tell a story. Many journalists at larger organizations like *The New York Times*, *Huffington Post RYOT*, *The Wall Street Journal*, *Al Jazeera*, NBC and *The Guardian* ("10 Great Examples," 2016) have used VR videos to as a storytelling medium for the news as in the form of panoramic shots of video footage, and some have even made news documentaries entirely in VR when a certain situation calls for or can benefit from a 360-degree view. As an example, in a conference presentation for the 2018 Online News Association, Veda Shastri, former immersive storytelling producer at *The New York Times,* recounted the following reasons to use VR videos in breaking news stories. One, when space is visually arresting, or part of the story itself. Two, when showing the scale or extent of a scene that would be best contextualized using a panoramic view, such as a fire-damaged landscape or a massive crowd. Three, when given access to a place or situation that is not easily accessible to the public. Four, to establish a feeling of intimacy with the subject of a story to feel alone with someone or alone in space. Five, in situations requiring or benefitting from an artistic use of perspective such as capturing a unique view using first-person camera height (Shastri, 2018).

The literature review of this thesis refers broadly to VR video news packages or VR video news documentaries as VR journalism. In some media research, VR journalism is also

referred to as immersive journalism (IJ) as highlighted by the following researcher talk from the International Academic MindTrek Conference.

> Immersive journalism refers to the production of news to support participants (audience) gaining first-person experiences of the events or situations in the news stories. Typically, the person is represented as an avatar (an animated 3D representation of the participant) with a first-person view in the virtual environment and enters a virtually recreated scenario of the news story. In immersive journalism, the participant feels being there at the scene of the news story, and participant's body is part of the news story, either as him/herself, as a visitor at the location, or as a character of the news story. In addition, illusion related to body ownership can be created that supports immersive journalism (Sirkkunen et al, 2016, p. 4).

Research supports the idea that immersion is a process that may occur in a variety of different mediums such as cinema. As such, it is important to specify that VR journalism may be distinct from IJ in the sense that many mediums have an opportunity to be immersive. For the context of this thesis, the term VR journalism rather than immersive journalism (IJ) will be applied mainly because this research tries to analyze the level of immersion that may or may not be inherent in different medium conditions (print, click-through VR, HMD VR) of the same story, "The Displaced." As such, referring to VR journalism as IJ may muddy the definitions of immersion in media in a way that would be unfavorable to the clarity of this thesis. However, some media research on this topic will refer to VR journalism as IJ, and so in certain citations of the research, readers of this thesis may need to think of the two as interchangeable at least within the context of this literature review. Nonetheless, it is important to examine how immersion plays a key role in media consumption and further explicate that role.

Immersion absorption and presence in story medium

In the book *Hamlet on the Holodeck*, the origin of the term immersion is explained for readers as follows:

> Immersion is a metaphorical term derived from the physical experience of being submerged in water. We seek the same feeling from a psychologically immersive

> experience that we do from a plunge in the ocean or swimming pool: the sensation of being surrounded by a completely other reality, as different as water is from the air, that takes over all our attention, our whole perceptual apparatus. (Murray, 1997, p. 172).

In other words, to be immersed is to feel as if a part of another reality, part of the reality of something external to yourself. The concept that one might lose a sense of physical presence and instead envision presence within the scene of a story being told or a form of art is often referred to as immersion. And while the term immersion in media research has its roots in poetic and artistic experience it has become a widely adopted model to describe the phenomenon of imagining oneself in another physical space.

Some researchers argue that immersion may be a side-effect of the technological medium of story, which may, according to these researchers, impart greater immersion as an effect of the technology according to Adams & Rollings (2006), Arsenault (2005), Ermi & Mäyrä (2005), McMahan (2003), Ryan (2001, 2008), Slater (2003) and Witmer & Singer (1998). These researchers advocate for a definition of immersion referred to as "system immersion" or the idea that "immersion has been used to describe both the technology surrounding the user and the user's response to being surrounded by technology" (Nilsson, Nordahl & Serafin, 2016, p. 114). This view on immersion can apply to the hypothesis of this thesis that posits that medium of a news story (print, click-through VR, HMD VR) will have a relationship to user's reported levels of immersion and supports the hypothesis that immersion (presence) will be felt in a greater degree depending on the technology used: "In line with the conceptualization of system immersion, these technologies are not equally immersive because they vary in terms of the extent to which they deliver multisensory displays and are able to translate the movements of the individual into virtual actions" (Nilsson, Nordahl & Serafin, 2016, p. 119).

For an example of what is meant by system immersion even in art research, the article, "Immersion in the Visual Arts and Media" suggests a two-pronged definition for immersion that applies older understandings of immersion in poetry and other texts as well as a new-world understanding of immersion within the context of digital media is proposed. "We envision a double perspective on the concept of immersion: firstly, as it has developed in the theories of the arts and media and secondly as it is produced and reflected by the artworks themselves" (Dogramaci & Liptay, 2015, p. 2). While the research looks at immersion primarily through an artistic rather than a journalistic lens, the attempt in that study to view immersion as a process engendered by the "artworks themselves" can inform the practice of viewing medium as a potential continuum for an immersive experience.

It is notable that immersion has been applied in media research to describe a phenomenon in news audiences as well as in the arts. In the article, "The role of imagination in literary journalism" immersion is noted as a key feature of long form print journalism:

> Immersion is also highlighted as a key literary journalistic practice— even as distance from a subject is also vital to change perspective and take a broader or aerial view to allow for reflection and [re]configuration. Further, practitioners should be wary of imposing a high degree of closure in works of literary journalism in deference to the range of possibilities afforded by imaginative —symbolic and epistemically justified— engagement with a subject (Morton, 2018, p. 105).

Many of the same researchers who connect immersion to story medium (system immersion) also tend to agree that immersion is linked to the concept of absorption including Arsenault (2005), Ermi & Mäyrä (2005), McMahan (2003), Ryan (2001, 2008). In a study analyzing immersion as part of gameplay experience, Laura Ermi and Frans Mayra argued that absorption was the process of "directing attention to an experience that is brought to mind" and that immersion was a process of "becoming physically or virtually a part of the experience itself." Additionally, the researchers argued there are four different types of immersion: "Four realms of experience can

be defined with these dimensions: entertainment (absorption and passive participation), educational (absorption and active participation), aesthetic (immersion and passive participation) and escapist (immersion and active participation)" (Ermi & Mäyrä, 2005, p. 4). Based on these specifications, one might argue that VR journalism falls into the immersion category of escapist experience because it requires those viewing the virtual reality to interact with their environment as part of the experience, be that by looking around, clicking around, or, in games, interacting with objects in the virtual space using body movements.

Like with absorption, immersion has also been connected to theories of presence. Media researchers have analyzed immersive and absorptive engagement with stories in a variety of ways, but often measure level of immersion as a self-reported feeling of presence within the scene Usoh, Catena, Arman & Slater (2000). This view posits that a self-reported sense of being there is vital to measuring the effect of immersion. As such, to measure the participant's level of immersion in this thesis, questionnaires on presence from each of the studies were utilized.

Linkage between VR, and system immersion

When talking about the linkage between immersion and VR, it may be helpful to take a step back and talk about the concept of "telepresence" coined by Marvin Minsky in 1980 to describe the feeling of presence in another environment using a robotic proxy (Minsky, 1980, p. 45-52). As noted in the paper "Immersion revisited: a review of existing definitions of immersion and their relation to different theories of presence" later research from Sheridan (1992) updated Minsky's definition of presence to add that "an individual similarly may experience a sensation of being physically present during exposure to multisensory stimuli generated by a computer" (As cited in: Nilsson, Nordahl & Serafin, 2016, p. 119). While at the time there was no way for Minsky or Sheridan to see and interact with the technology we know

of as VR today, telepresence is foundational to explaining the phenomenon of immersion in that it predicted the ability for technology to facilitate immersion to another environment and can help inform how system immersion might predict a deeper sense of immersion based on technological advances.

The 2017 study "Being there in the midst of the story: How immersive journalism affects our perceptions and cognitions" (Sundar, Kang & Oprean, 2017, p. 675) showed a linkage between VR as a medium and higher reported empathy among participants. This study is a major work informing this thesis especially due to its use of the same stimulus material, "The Displaced." Notably, this study did find an increase between the reported empathy of subjects who viewed "The Displaced" in VR as compared to subjects who viewed "The Displaced" via click-through VR or print conditions.

Upon data analysis of the results above, the researchers noted that "a significant main effect shows that participants in the VR and 360°-video conditions were more empathetic toward the story characters than their counterparts in the text condition" (Sundar, Kang & Oprean, 2017, p. 675). In other words, greater empathy was achieved in relation to greater immersion via a sliding scale of immersive mediums (Text, 360°-video, and VR).

Not only does the Sundar, Kang & Oprean (2017) study offer support for one of the central assertions of this thesis, that level of immersion differs based on medium and has a mediating relationship to empathy, but it is also helpful within the context of this thesis due to the medium conditions it uses, and alignment between stimuli. This study uses the same documentary that I use as my stimulus material, "The Displaced," for reasoning that runs parallel to the Sundar et al. 2017 study. "The three storytelling mediums were selected for study based on their relative levels of modality and interactivity, with VR being richer in both, followed by

360°-video, then text, thereby making it more likely to trigger presence related heuristics" (Sundar, Kang & Oprean, 2017, p. 673). Because of the parallel nature of this study to my own, it is a foundational work that will be revisited throughout this thesis.

The ethos of individual stand-ins for systematic problems in journalism

Within modern media, the stories of individual sources are often used as a means to illustrate a larger societal issue. Speaking from personal experience, as a reporter, it is very common to be encouraged by an editor to find the human element of an otherwise data-driven story using anecdotes that are meant to pull on the heartstrings of readers. But you don't have to take my word for it, as this phenomenon has been named by a several researchers. As noted in the research paper, "The promise and peril of anecdotes in news," the use of personal stories to stand in for systematic problems in media is common and, as the paper points out, can have pitfalls. "Journalists for print and broadcast media often use anecdotes about individuals to illustrate larger points," (Craig, 2003, p. 802). This type of thinking, which may have its roots in Jacob Riis's book *How the Other Half Lives* (more on that later in this thesis) serve to bring in stories from individual people in addition to raw data and figures as a means towards getting the audience to care more about an issue of society. In *How the Other Half Lives* the lives of one impoverished family are described as a strategic way of getting audiences to pay attention to income inequality in the New York slums of the 1880s. According to some researchers, this foundational text arguably changed the way journalists wrote about the issues of their times and further solidified the use of individuals as stand-ins through personal anecdotes in the media Sillesen, Ip & Uberti (2015).

Being that this is a standard and accepted practice in modern media, using individuals and their anecdotes as stand-ins for larger things is so common in the industry, it is often taught,

especially when it comes to writing profiles or human-interest pieces as they are sometimes called. According to a Poynter guide on interviewing folks for profile writing, "good profiles have anecdotes that reveal how the person became who they are," (Ager, 2002). Furthermore, there is media effects research that suggests that framing the news via individuals rather than via raw data makes a difference in the minds of news audiences. And not without reason, "studies of framing effects' have found that episodic and human-interest frames—in which anecdotes are often an element—affect audiences' thinking in important ways," (Craig, 2003, p. 803).

However, it is true that this framing, while a convention of journalism, can be a double-edged sword. In his book, *Is Anyone Responsible*, researcher Shanto Iyengar provides evidence that individual framing of TV news coverage may cause audiences to blame individuals for the plights that befall them, even if those anecdotes were meant to stand in for systematic issues (Iyengar, 1991, p. 11- 23). Given the tradition in journalism of using individuals as shorthand for systemic injustices, like refugee sources as stand-ins for the refugee crisis as with "The Displaced," a desire by journalists to capitalize on anecdotes to drum up empathy for subjects may be puzzling to psychology researchers, but comes second nature to many folks on the job. Because of this, it's important to keep this viewpoint in the industry as top of mind when trying to understand the aforementioned rush in journalism towards VR as an empathy machine.

The journalistic dogma of empathy

Within the context of journalism, empathy is sometimes brought up in a dogmatic sense, as a necessary part of the job and something to engender in news audiences. In a 2016 study about the role of empathy in journalist's working lives, Antje Glück found that: "all journalists considered empathy as a central quality of their work" and that empathy was considered a key component of the job unanimously among journalists interviewed with one respondent

describing empathy on the job as a "very crucial part of it … a trait that you need to be able to be a journalist" (Glück, 2016, p. 897).

As noted in the Columbia Journalism Review article "Journalism and the power of emotions," perhaps the father of empathetic journalism as a practice was 1880s photojournalist Jacob Riis, who "sought to humanize the poor" and has since become a "journalistic lodestar" motivating journalists to create articles that influence empathy in others (Sillesen, Ip & Uberti 2015). With this industry outlook in mind, empathy is a concept that could prove immensely helpful for targeting messages of mass communication to audiences in a way that engages them, calls them to action and stirs something within them in mass media contexts according to industry practitioners like Dr. Kim Bui (Biu, 2018). Indeed, for some practitioners like Bui, encouraging journalists to make space for more empathy in their jobs is tantamount to their personal brands. Newer media movements like 'activist journalism,' and 'solutions journalism' often advise journalists to consider empathy in their newsgathering processes and indeed function as movements where the point of journalism is to catalyze change through what many may refer to as the process of sparking empathy.

It's clear that in the field, journalism professionals are coming to value empathy to a great extent. For example, when I asked my former colleague where he saw the future of empathy in journalism in the next few years, then GateHouse Media de//space Innovation Lab digital product strategist Tyson Bird connected deeper empathy back to inclusion in newsrooms, citing it as a positive side effect of greater diversity in newsrooms: "I'm inspired by how the younger, the more colorful and more female that a newsroom becomes, suddenly the more empathetic the newsroom becomes as well" (Bird, personal communication, September 2019). With empathy increasingly being seen as a crucial component of journalism, it's worth asking: how might

empathetic journalists make for better journalists? The answer, according to some, is better storytelling. One study found that "a combination of respondents' empathy for their sources, non-stigmatizing attitude toward mental illness, and understanding or knowledge of the illness facilitated good storytelling" in journalists' reporting on mental illness (Subramanian, 2014, p. 818). So, it's increasingly clear that empathy is becoming a focal point for journalism as a profession, but what does that specifically mean on the job?

Case study: The Empathy Model in Journalism Innovation Labs

In industry conversations, empathy is gaining steam as something to be modeled and considered in modern newsrooms. For instance, in journalism product development happening in journalism innovation labs such as the one I work at for Gannett (formerly GateHouse Media), something called the empathy model is applied when news products are being tested by journalists in the field. Bird explains this process as follows:

> The key to the empathy model is to understand the sensory truth about what your customer or audience is feeling, not your interpretation of what you think they're feeling. So there's a little diagram in Business School and it has like five heads and it says: what are they thinking, what are they feeling, what are they saying, what are they hearing, so again, these are all like sensory facts and then when you do research or as a journalist when you're conducting an interview you go through these steps and it's not saying "are you seeing this" because that's priming, you have to say "what are you seeing?" (Bird, personal communication, September 2019).

The empathy model, in this application, is to exercise empathy with interviewees when asking questions about a product under development, but as Bird mentions, it can also serve as useful for reporters in constructing interview questions for sources. The point, as Bird sees it, is to demonstrate a desire to understand the feelings of others, as he would put, to empathize with others. This is just one specific example of how empathy is being used as a tool in the toolkit of journalists, and sheds further light on a growing momentum towards empathy in journalism and

helps to explain why in the industry, there has been excitement over connecting empathy with VR.

Empathy and VR: star crossed lovers of journalism?

In the past, folks in journalism have been quick to make the connection between empathy in journalism, and VR. "Empathy has been a recurring need for journalists, from connecting with your sources in-person to developing virtual reality material that encourages users to take action," said Christine Schmidt, in a 2018 Nieman Lab article. Though some people in the industry pushing adoption do concede that it may be too early to say what effect VR may have on empathy in news audiences: "As a reporting tool, virtual reality is still in its infancy; its power to create empathy is just beginning to be understood" (Hare, 2015).

"Some early adopters have pointed out that VR could possibly be used to engender empathy in news audiences, as noted in another Nieman Lab article, "News outlets left and right and up, down and center are embracing virtual reality technology" researchers David Ho and Jessica Yu "believe VR can deliver an added "sense of wonder" and a "physical, visceral reaction" to viewers (There are studies, Yu pointed out to me, that explore how VR might help people develop greater empathy)" (Wang, 2015). But not everyone is convinced. "Some people think VR will act as a kind of empathy machine, though I'm not sure I'd go that far (and besides, don't novels do that already?)" (Mullin, 2015). So, as more evidence is needed to help settle the debate, this research seeks to engage deeply with the question: what is empathy?

EXPLICATING EMPATHY

Assessing empathy, operationalizing the term, and finding reliable measures for it can drive key insights into the field of communication. As messaging, especially in 24-hour news cycles often involves empathic concern and perspective-taking to provide call-to-action moments for audiences. If this were not the case, it would not be so commonplace to see media providing natural disaster relief hotlines and social media awareness campaigns in their coverage. That prompts the question: how can mass media practitioners understand and utilize empathy in their messaging at a time when the rise in VR technology is changing the field of journalism and communication? This examination of empathy as a concept utilized in the field of journalism will illuminate how empathy relates to existing theories of mass media communication and ponder the implications immersive technologies like VR may have on news audience empathy.

What is empathy?

'Empathy' first appeared in the English lexicon in the late 20th century with etymological origin suggesting it was pulled from the German term "Einfühlung" translating to mean "to feel into" (Frankel, 2017, p. 3). One might theorize that the addition of the word empathy into the English language was meant to address a lexical gap between English and German, wherein no word before it could describe the feeling of being in another's place. In an academic essay, D. Rae Greiner argues that empathy is an aesthetic experience since it is impossible to literally feel the body of another person "One can't simply read the other's emotions from physiological signs: feeling into bodies and feeling into art require identical acts of project" (Greiner, 2011, p. 1). Empathy has massive implications for interpersonal communications, influencing the way that certain people may interact, and how others may relate to one another. "The ability to share the feelings of others (empathy) is a vital aspect of human social interaction; it is a core

component underpinning our ability to form and maintain interpersonal relationships, to predict the behavior of those around us, and to respond adaptively to the ever-changing demands of complex social situations" (Absher & Cloutier, 2016, p. 289). As other researchers put it, "a fundamental feature of the empathic experience is the sharing of representations between self (observer) and other (empathic target)" (Absher & Cloutier, 2016, p. 291).

Where Frankel, Greiner, and Absher & Cloutier defined empathy by implying a level of shared experience, other researchers also theorized that empathy was not just a shared experience on an imagined level, but rather a state of emotional being. They might describe empathy in terms that sound almost like a communicable virus. Christian B. Miller noted in his 2013 book, *Moral Character, An Empirical Theory*, that one might break down empathy conceptually into the following categories: emotional contagion, or the idea that you can "catch" the same feelings as others, and projective empathy, or the idea that you can mentally imagine the situation of another and then feel the same feelings they might feel in that situation. Mark H. Davis, who created the interpersonal reactivity index test (which was later built upon with the Toronto Empathy Questionnaire) wrote: "empathy in the broadest sense refers to the reactions of one individual to the observed experiences of another" (Davis, 1983, p. 113).

Empathy in the social sciences

Empathy is a concept that has been widely debated and studied within the fields of psychology, sociology, and even medicine. Mark H Davis theorized that empathy had multiple components. including perspective-taking, fantasy, empathic concern, and personal distress. (Davis, 1983, p. 113-116). Davis' field is psychology, in fact he is currently a psychology professor on staff at Eckerd College in St. Petersburg, Florida, however, his research provides a great foundation that is often cited in communications research and was the basis for many other

empathy studies in a variety of disciplines looking at empathy as a concept. Davis imagined empathy to have four components, each measured in his interpersonal interactivity index test:

> The 28-item IRI is a self-report measure consisting of four 7-item subscales, each tapping some aspect of the global concept of empathy. The Perspective-Taking (PT) scale assesses the tendency to spontaneously adopt the psychological point of view of others; the Fantasy (FS) scale taps respondents' tendencies to transpose themselves imaginatively into the feelings and actions of fictitious characters in books, movies, and plays. The other two subscales measure typical emotional reaction s of the respondents: the Empathic Concern (EC) scale assesses "other-oriented" feelings of sympathy and concern for unfortunate others, and the Personal Distress (PD) scale measures "self-oriented" feelings of personal anxiety and unease in tense interpersonal settings (Davis, 1983, p. 113-114).

As will be explained further in later sections of this thesis, the IRI is one of the foundational concepts that is considered for measuring empathy later on in the Toronto Empathy Questionnaire.

Empathy in communications research

Researchers agree that empathy is important for interpersonal communication, however significantly less research has gone into how empathy impacts the understanding of mass media messaging, despite the heavily media-centric environment in which people currently live. Recent research papers accessible through the communication and mass media complete database pertaining to empathy include a Price & Kaufhold (2019) study on empathy and attitudes towards immigration, a Tsang (2018) study on how empathy might help to address hostile media phenomenon (the theory that media consumers tend to see media as hostile to their political beliefs), a Wain (2017) study on how empathy might play a role in how intellectually impaired and intellectually gifted individuals might relate, and even a Bentham (2017) study on how empathy was formulated in the TV show, *Breaking Bad.* But perhaps the most prolific of disciplines when it comes to empathy research, is within the field of psychology.

Empathy vs. Sympathy

In its relatively short lexical lifespan, empathy as a term is often used in colloquial English interchangeably with the term sympathy but is more precisely meant to indicate a feeling of concern for others on the level of shared experience. As researcher Abhik Roy put it: "Empathy is actually an emotional resonance or identification with the other person who is suffering" (Roy, 2016, p. 2). This aspect of 'emotional resonance or identification' is referred to by several other researchers as perspective-taking. The facet of empathy known as perspective-taking was first coined by Mark H Davis (1982) but is also widely built upon by many later researchers, including Spreng, McKinnon, Mar & Levine (2009) who developed the Toronto Empathy Questionnaire, and also Schutte & Stilinovic (2017), who wrote the study on which this thesis was modeled after. If then, researchers examine empathy as a process of perspective-taking, in mass communications the ability to strongly identify with others is an excellent strategy for inviting audiences to participate in prosocial behaviors such as donating to charitable causes related to the news story or engaging in other prosocial activities such as becoming involved with an organization or coalition aiming to address the problem brought up in the news story (more on that in the latter section of this thesis).

By contrast, sympathy is defined a little differently in that it still involves feelings of care for another but does not rely on the carer to take on the feelings of another by identifying with them, as Roy might say. And in fact-sympathy has a similar etymological origin to empathy in that the term sympathy roughly translates to "feeling with" rather than "feeling into" (Thirioux, Mercier, Blanke &. Berthoz, 2014, p. 1). This minor distinction on base-word helps to illuminate a subtle but important difference between empathy and sympathy, or, put another way:

> Sympathy is an emotion which involves some form of care or concern for another person. The other person is the object of this state, and so the attitude is third-personal rather than

> first personal. As we have seen, empathy proper is rather different--one adopts the first-person perspective of the other person and thinks about the world with her, rather than being directly concerned about her (Miller, 2013, p. 106).

Despite the number of times empathy and sympathy can be conflated in everyday speech, researchers do make distinctions such as the one above between the concepts fairly regularly, and it is also worth noting that fields beyond communications and social sciences have been taking a crack at understanding what might make the difference between empathy and sympathy, especially in neuroscience.

In a 2014 study titled "The Cognitive and Neural Time Course of Empathy and Sympathy: An Electrical Neuroimaging Study on Self–other Interaction." researchers were able to find that empathy lit up a greater region of the right lobe of the brain than sympathy. "At 333–424 ms, empathy generated greater co-activations in the right IFG and dlPFC" (Thirioux, Mercier, Blanke &. Berthoz, 2014, p. 298). While my thesis does not take a neuroscientific look at the empathy response, the aforementioned study is key to the argument that sympathy differs from empathy because it confirms what social science researchers had posited for a long time, that there is a difference between empathy and sympathy in the first place, because it can be observed in brain activity.

Intersections of empathy and political ideology: the case study of same-sex marriage

One of the measures of political ideology that is utilized in this thesis is a research scale developed by the Pew Research Center called the Ideological Consistency Scale that allows participants to indicate between two politically opposing statements which best represents how they feel on a range of subjects related to policy issues. Within the write up on the tool is an explanation on why some statements are no longer representative of American's political ideology, namely on same-sex marriage:

> In addition, while the range of the scale (from -10, all liberal responses, to +10, all conservative responses) remains the same throughout the period of study, the "center" of the American public does shift. For instance, in 2014 the mean on the scale is -0.6, slightly to the left; in 1994 the mean score was slightly to the right (+0.6). To a large extent, this shift reflects an overall societal shift to the left on two issues: homosexuality and immigration. ("Ideological Consistency Scale," 2014).

Historically, political ideology has mediated attitudes on sexuality. As cited in "In Defense of Tradition: Religiosity, Conservatism, and Opposition to Same-Sex Marriage in North America" "Political ideology is also associated with sexual prejudice, with conservatives exhibiting more sexual prejudice than liberals (Barth & Parry, 2009; Haslam & Levy, 2006; Whitley, 1999; see also Pacilli, Taurino, Jost & van der Toorn, 2011)." However, as noted by Pew Research Center, political ideology is no longer an accurate predictor of attitudes towards same-sex relationships or marriage.

This shift in political ideology comes as attitudes in the United States have shifted broadly on LGBTQ+ related issues, and some researchers have posited that this is the result of a shift in empathy for LGBTQ+ people. As one researcher noted, "empathy allows someone else's experience and perspective to become part of our moral baseline and therefore can function to help us overcome prejudice and misconceptions' (Koehn, 1998, p. 57). Other researchers have confirmed a similar phenomenon, wherein folks who experience a higher level of empathy are less inclined to behave in a non-supportive manner towards gay marriage and gay couples being able to adopt. "Based on simple bivariate correlations, higher levels of empathic concern and perspective-taking as well as lower levels of SDO were associated with greater support for same-sex marriage and adoption" (Vecho, Poteat & Schneider, 2016, p. 29).

Measuring empathy for communication studies

There are many measures for empathy that have been developed by researchers over time. One compilation list by the Center for Building a Culture of Empathy lists upwards of 25

scales that have been used to measure it. This presents both a blessing and a challenge for researchers trying to operationalize empathy as a concept. Much of the existing research into the concept of empathy comes from the field of psychology. As mentioned previously, one of the earlier researchers of the concept was Mark H. Davis, who in 1979 developed several measures for empathy, most famously the Interpersonal Reactivity Index or (IRI), a series of questions meant to assess empathy in respondents. The IRI is one of many measures for empathy attempting to create a scientific scale by which to assess the empathy for an individual. In his research, Davis advocated for a multidimensional approach to measuring empathy, also using tools such as the Empathic Concern (EC) scale, the Empathy Quotient (EQ) scale, and the perspective-taking (PT) scale (Davis, 1983, p. 117-125). Later researchers have looked to combine or improve the scales measuring empathy in such a way that reveals an individual's overall capacity for empathy such as the Toronto Empathy Questionnaire (TEQ) and their empathy for a specific person in each situation, and with modification of the original Davis Perspective-Taking (PT) scale.

Methodologically speaking, the scales of empathy such as the TEQ, and the adapted Davis 1984 Perspective-Taking Scale attempt to do the work of bringing empathy to an empirically measured level. Interestingly, the wide availability of scales by which empathy can be measured are also a limitation of empathy research. "Contradictory models of the "same" phenomenon represent a scientific paradox, the tension of two opposites that, in principle, cannot be reconciled" (Frankel 2017, p. 1). This is in part why the Toronto Empathy Questionnaire was developed, to find commonalities between other scales such as the IRI, the Questionnaire Measure of Emotional Empathy (QMEE), and the EQ scale among others.

MODERATORS OF PROSOCIAL BEHAVIOR

This thesis posits the hypotheses that empathy, personality disposition, and political ideology will moderate a participant's self-reported willingness to engage in prosocial behaviors including donating, talking to a friend about those affected by the refugee crisis and volunteering time to an organization related to refugees and the refugee crisis (the subject of "The Displaced"). Several academic studies and papers have found moderating effects on prosocial behavior depending on empathy level, personality disposition and political ideology, leading to the hypothesis that relationships between these self-reported levels will exist. To further understand the context behind these theories, this literature review explores some of the research behind these concepts.

Prosocial behavior and empathy

Researchers have asked in multiple studies what effect empathy has, if any, on prosocial behavior. As Miller notes, "Empathy for someone in distress is known to dramatically increase helping," but even Miller made an important distinction: "motivation to help arises from empathizing with another altruistic motivation, rather than egoistic motivation" (Miller, 2013, p. 76). In other words, empathy can increase the likelihood that someone might exhibit a helping behavior such as giving money, empathy, giving time, talking about an issue to raise awareness, however the context of that helping behavior does depend on how altruistic vs. egoistic the individual in question is. And beyond ego and altruism, researchers have long hypothesized other possible mediating factors between empathy and helping behaviors exist, including in-group and out-group conceptions of social place.

One study offered a story to participants about a college student named Katie Banks who lost her parents in a car accident, which was administered to fellow students at the University of

Kansas and the rival college, Kansas State (this choice of rival students was meant as a way to foster feelings of in-group vs. out-group bias in respondents to the experiment) (Batson, Sager et al., 1997, p. 499) but found participants "felt more empathic concern for Katie when they had been instructed to take her perspective; moreover, these participants were also more likely to help Katie, and the increased feelings of empathic concern seemed to mediate this process. Most importantly, Katie's status as an in-group or out-group member had no effect on these results" (Davis, Schroeder & Graziano, 2015, p. 11). In a TEDx Talk in 2017, researcher Jamil Zaki notes that empathic people are happier, report more friendships, are good at jobs that require a lot of interaction with people, and tend to positively influence others around them. For example, Zaki notes, patients with empathic doctors report lower rates of depression, employees with empathic bosses report less stress in the workplace, and romantic partners of empathic people report higher satisfaction with their significant others (Zaki, 2017). In the book chapter "Empathy and prosocial behavior" it is noted that researchers looking at a link between empathy and prosocial behaviors generally examine the following five factors: dispositional perspective-taking (PT), dispositional empathic concern (EC), situational perspective-taking, parallel emotional responses, and empathic concern (EC) (Davis, Schroeder & Graziano, 2015, p. 1-37). Dispositional perspective-taking refers to "the tendency to experience concerned, sympathetic or compassionate reactive outcomes in response to the needs of others" (Bekkers & Wilhelm, 2006 p. 10), and applies for the purposes of this thesis, wherein participants were given a perspective-taking questionnaire specific to their disposition after exposure to the stimulus.

However, there is some evidence that suggests that emotion-based messaging is not ultimately as effective in communication as solution-based messaging. One study which examined shock-oriented messages meant to elicit an emotional and empathetic response and

solution-oriented messages meant to appeal to reason regarding human trafficking found solution-oriented messaging to be far more effective (McIntyre & Sobel, 2017, p. 47). Is empathy as an emotional appeal truly a strong enough force to change the effects of a media message and will it change audience behavior in kind? It turns out there is some debate within scientific literature on whether empathy is a strong motivating factor of prosocial behavior, which is one reason that this thesis includes a research question rather than a hypothesis. about whether empathy increases the likelihood that news consumers will engage in more prosocial behaviors towards the people introduced in news stories. Some researchers have lauded empathy as a potential step in the process towards a more prosocial world, but others aren't so convinced.

In the article, "Empathy and the collective good: caring for one of the others in a social dilemma" researchers examined whether participants induced to feel empathy for others in a social dilemma would act with more altruism and found that increased empathy gave participants a sense of prosocial feelings towards individuals only, rather than groups of people (Batson et al, 1995, p. 624). Additionally, in the article, "Why fight? Examining self-interested versus community-oriented motivations in Palestinian resistance and rebellion" Nichole Argo notes that a person's values of self-direction, stimulation, hedonism, achievement, power, security, conformity, tradition, benevolence and universalism were strong motivating factors of the motivation to join the rebellion, not empathy (Argo, 2009, p. 663). In one chapter titled "A less attractive feature of empathy: intergroup bias" researchers noted that "various lines of evidence suggest that empathic concern and resulting prosocial behaviors are affected by intergroup biases" (Fourie, Subramoney & Gobodo-Madikizela, 2017, p. 49). Finally, in a 2012 study on the mediating effect empathy had on helping behaviors, it was found that higher empathy could hinder helping behaviors:

> Furthermore, in line with our hypothesis, results showed that both empathy and personal distress affected MD – empathy prevented the activation of these mechanisms, whereas personal distress fostered them. The more participants were concerned about others in need the less they relied upon cognitive maneuvering that obscured their personal responsibility. In contrast, the more participants felt internal anguish on seeing others in need the more they disengaged (Paciello, Fida, Cerniglia, Tramontano & Cole 2012 p. 6).

In this example above, MD refers to moral disengagement, or the idea of absolving oneself of a moral duty to act in the particular circumstances one finds themselves in. Therefore, if empathy may- or may not- be a mediating factor in behaving prosocially, other factors might be kept in mind as possible mediators for this type of behavior. Leading researchers to question: is acting prosocially a part of certain people's personalities?

Prosocial behavior and personality disposition

Beyond empathetic capacity, there is also research to support the idea that some personality dispositions make individuals more likely to engage in prosocial behaviors. In the article, "Prosocial behavior and the big five-factor model of personality: a theoretical review" researchers agree that "most studies support agreeableness and extraversion traits of personality as associated with prosocial behavior" (Shah & Rizvi, 2016, p. 164). In other words, the more agreeable (trusting and helpful) or extraverted (outgoing) an individual is, the more likely that individual is to engage in acts of altruism. One cross-sectional survey of college-age students in Nigeria found that there was a significant relationship between personality disposition and prosocial behavior (Olukayode, 2013). Additionally, some studies have looked at the linkage between a particular facet of personality and prosocial behavior, showing a relationship with agreeable participants. "Overall, prosocial motivation is linked to (a) Agreeableness as a dimension of personality, (b) proximal prosocial cognition and motives, and (c) helping behavior across a range of situations and victims" (Graziano, Habashi & Sheese, 2007, p. 583). Another study found that agreeableness did have a relationship to prosocial behavior, however, in that

study, the researchers also noted that self-transcendence, or “accepting others as equals and having concern for their welfare” and empathic self-efficacy or having the “capability to sense another person's feelings and to respond empathetically to others' distress and misfortune” were parallel processes to personality disposition that led to prosocial behaviors among participants in their study (Caprara, Alessandri & Eisenberg, 2012, p. 1299). These results make it clear that the process of behaving prosocially towards others is driven not only by personality disposition, but also by empathy, leading back to a full circle picture of what processes may moderate helpful behavior towards others.

Additionally, a longitudinal study of young adolescents who aged into young adults examining personality disposition changes and prosocial behavior changes noted that “...out of the five BFF traits, we found that changes in Agreeableness, Conscientiousness, and Openness were related to change in prosocial behaviors and vice versa” (Luengo, Pastorelli, Eisenberg, Zuffiano, Castellani & Caprara, 2014, p. 709). In that study, while conscientiousness and openness were also associated with prosocial behaviors, the disposition most highly predictive of helpful behaviors was still agreeableness, even after participants had grown from teenagers to young adults. This work suggests that even during times of dispositional transition such as the process of growing up, those who have agreeable dispositions still tend to behave helpfully towards others, even if their own concepts about what is helpful may change. Further, one study even found that participants with higher agreeableness and conscientiousness are better at perceiving the pain of others, which may contribute to why these personality dispositions are widely associated with prosocial behavior (Courbalay, Deroche, Prigent, Chalabaev & Amorim, 2015, p. 96-97). That tendency for agreeable and conscientious oriented personalities to recognize pain in others may once again provide an explanation for why it is often noted that

when it comes to prosocial behaviors, empathy and personality disposition can go hand in hand in creating motivation for someone to behave helpfully towards another, because perceiving the pain of others may be seen as another dimension of empathy, requiring people to take the perspective of another to recognize what is otherwise not a shared experience (in this case, pain).

However, just like with research that examines the linkages between empathy and prosocial behavior, researchers have also noted that personality dispositions most associated with prosocial behavior, like agreeableness, can come with a double-edged sword of effects. In the 2015 study, "Personality Predicts Obedience in a Milgram Paradigm" agreeableness, in particular, was found to have a disturbing tendency to affect individual's judgement, where participants were likelier to administer what they believed to be electric shocks to other participants in the style of the famous original Milgram experiments. This study noted that "People with agreeable dispositions avoid violating norms or upsetting others, and they easily comply with social expectations" (Bègue, Beauvois, Courbet, Oberlé, Lepage & Duke, 2015, p. 300). This suggests that when prosocial behavior is pressured or encouraged in social situations, agreeable participants may be more likely to engage prosocially, but importantly, in situations where social pressure exists to behave in ways that are antisocial and even dangerously, as in the case of the Milgram experiments, the decision to act in 'evil' ways may be seen as banal, or part of someone's innate nature. This concept is strongly related to what is referred to as banality of evil theory, which was coined by political theorist and Jewish refugee Hannah Arendt in the 1963 book, *Eichmann in Jerusalem: A Report on the Banality of Evil*, after Arendt spent years reporting on the trial of Nazi war criminal, Adolf Eichmann. Banality of evil describes the idea that evil acts may be motivated by several otherwise banal or harmless factors, such as being in a bureaucratic position or being ready to obey orders and stemmed heavily from Arendt's

observation that Eichmann did not appear to be sadistic or calculating in his execution of those killed in the Holocaust. In the paper, "Revisiting the Banality of Evil: Contemporary Political Violence and the Milgram Experiments," the author noted that one of the reasons that banality of evil theory was particularly related to Milgram's study was that "Milgram's findings were both unexpected and startling: the experiments showed that ordinary human beings were capable and willing to inflict a great deal of pain on other human beings (on total strangers) for no other reason than being ordered to do so by an authority figure" (Hollander, 2016, p. 57). This finding, coupled with the understanding that agreeableness generally measures an individual's tendency to conform to social expectations and feeling for others, gives a more complete picture of why agreeableness may indeed present conflicting effects on prosocial behavior.

Prosocial behavior and gender

It is also worth noting that there are expected differences in prosocial behaviors among men and women, which is tied in with a general likeliness that gender will influence an individual's personality disposition (Shah & Rizvi, 2016, p. 165). Research also finds a correlation between gender and the likelihood to perform prosocial acts. A study by Yoleri (2014) found that among preschool boys and girls, girls were more likely to behave prosocially. For these reasons, this thesis makes use of the Big 5 personality inventory as well as a questionnaire item on gender to separate the data on prosocial behaviors and perspective-taking among different personality types and genders.

Prosocial behavior and political ideology

There is also evidence that suggests that political ideology may have an effect on people's willingness to exhibit prosocial behaviors towards others. In the study "Bleeding Hearts and the Heartless: Popular Perceptions of Liberal and Conservative Ideologies," researchers

found that political groups differed in their self-reported willingness to engage in prosocial behavior, specifically donations. The results of the study found that liberal's self-reported willingness to donate was higher than that of conservatives (Farwell & Weiner, 2000, p. 847). A later study with one of those same researchers found a similar effect. When participants were scored and placed into three categorical profiles: caring, blaming, and ambivalent, each measured against political ideologies, they found that "those in the caring profile were less conservative and lower on system justification than those in the blaming profile. In turn, belonging to the caring profile was associated with more sympathy and less anger towards those in need, as well as a greater willingness to personally help (and suggest that others should help) the poor, relative to those in the other profiles" (Osborne & Weiner, 2015, p. 153). Further, in keeping with these previous findings, when participants of another 2019 study were asked to self-report their willingness to donate to victims of typhoon Haiyan in the Philippines, again those who reported being more liberal were more willing to contribute (Manesi, Van Lange, Van Doseum & Pollet, 2019).

To contextualize the tendency for political ideologies to relate to how people react in social situations, be that in caring, blaming or ambivalent ways as previously described, there are other proposed reasons for why conservative political ideologies may have a negative relationship to prosocial behavior. One theory is that individuals who identify as conservative also have a greater propensity towards individualism and competitiveness which can have many important effects on social interaction.

> From this perspective, competitors are the ones that are likely to score highly on worldviews characterized by distrust, competition and the struggle for scarce resources. As such, what needs to be illuminated are specific differences between individualists and competitors, especially as they might be linked to distrust, worldviews, and to how members of out-groups ('them') should be viewed and treated (e.g. immigrants) (Van Lange, Bekkers, Chirumbolo & Leone, 2011, p. 470).

With this added perspective that individualism and competitiveness are traits common among those who identify as conservative but may also inform a more hostile or distrusting worldview- this is one possible explanation for why political ideology may predict prosocial behavior. With studies suggesting this linkage, the question of whether prosocial behavior is mediated by political ideology as a confound is central to this study and explains the methodological decision to measure for political ideology among subjects, as described in further detail later in this thesis.

NEED FOR THIS RESEARCH

Especially within the context of the 360-degree video boom in media, questions about how VR impacts empathy in news audiences are emerging. However, scientific literature has not kept up. A survey of existing scientific literature on the topic of VR turns up thousands of results pertaining to VR use in the gaming industry, however far fewer results are available when looking at research on virtual reality in mass media research databases like *Communication and Mass Media Complete.* As of November 2018, this database turns up only one result when the search term "virtual reality journalism" is queried.

Whether or not virtual reality truly instills greater empathy in audiences is a subject in need of more study, and within the field of communication, is too often left up to speculation. Academic studies are already emerging to test the idea that virtual reality messaging is linked positively with user's reported levels of immersion. One such study, titled "Experiencing Nature: Embodying Animals in Immersive Virtual Environments Increases Inclusion of Nature in Self and Involvement with Nature," found a positive relationship between audience engagement with nature after displaying animals in virtual reality (Ahn, Bostick, Ogle, Nowak, Mcgillicuddy & Bailenson, 2016, p. 417).

As the technology for virtual reality journalism improves, and adoption becomes more widespread it is imperative that research on the topic is conducted more often and made available to journalists and the public. With studies like this already being conducted in other fields and questions about facilitating empathy using VR being posited in trade publications and in marketing materials, it is time for mass communication researchers to catch up. Media researchers who have a vested interest in helping media practitioners should have a responsibility to examine what effect — if any —virtual reality journalism will have on audience immersion

and ultimately audience empathy so that journalists can make decisions about utilizing the technology from a fact-based standpoint.

This thesis is meant to contribute to the body of work examining whether virtual reality facilitates empathy in news audiences and if those emotional responses compel involvement or action from the audience. On a practical level, answering these questions can inform journalistic storytelling strategies within the context of activist journalism. If future journalists can use virtual reality to engender greater empathy in consumers of the news, it could be a great force for social change. And if not, it will be useful for journalists to know that VR technology may not influence audiences intended by media practitioners.

Key Studies

To examine the question of what the relationship between VR journalism and empathy may be, this thesis —which attempts to build off the work of the pilot study "Facilitating Empathy Through Virtual Reality" Schutte & Stilinovic (2017) and the study, "Being there in the midst of the story: How immersive journalism affects our perceptions and cognitions," Sundar, Kang & Oprean (2017)— posits that participant's reported level of empathy is mediated by participant's reported level of immersion. Being that there is a wealth of research addressing VR in modern academia, this master's thesis attempts to pick up where many studies, including Sundar, Kang & Oprean (2017) and Schutte & Stilinovic (2017) leave off. Notably, the Schutte & Stilinovic (2017) pilot has some key similarities to the design of this experiment, especially the focus on the refugee crisis (as explored through the 2015 VR film, "Clouds Over Sidra") and with an eye towards empathy (perspective-taking) and VR. Moreover, Sundar, Kang & Oprean (2017) has two key experimental design similarities: with the same conditions (print, click-

through VR, and HMD VR, which are termed text, 360°-video, and VR in their study) and the same stimulus: "The Displaced" from *The New York Times*.

However, there are limitations with both key studies my thesis attempts to address, including the Schutte & Stilinovic (2017) study's lack of media and communications lens. Additionally, Schutte & Stilinovic (2017) fails to make any conceptual linkage between immersion and technological medium (system immersion). For Sundar, Kang & Oprean (2017), this thesis trains a critical eye towards the terminology of "immersive journalism," and strays away from applying the MAIN model, which in this thesis, doesn't seem like a correct fit to explore the linkage between medium, level of immersion and level of empathy. An examination of how the Sundar, Kang & Oprean (2017) study measured immersion revealed that the researchers tested for immersion level using the MAIN model (a measure developed by one of the researchers of their study to get at different aspects of immersion, but not an immersion test that is widely used in similar literature). Especially with regards to the application of the MAIN model, which it should be noted was coined and designed by the first author of the study, Shyham Sundar, it seems like an assumption that this model would help to address individual immersion towards subjects of a news story, when the model itself is an approach to addressing individual's perceptions of credibility of a message as mediated by technology. To contextualize the measurement, it is helpful to view the explanation given in their study for what constitutes their researcher's definition of immersion as measured by the MAIN model, as the concept has been broken into three heuristics: 'being there' 'interaction' and 'realism.'

> Being-there heuristic -- "I am part of the action, therefore I am present" -- is triggered when a user is drawn into the mediated environment...interaction heuristic (the more interaction, the better) is triggered when a given medium enables user action with content...realism is based on the rule that "seeing is believing" that pictures cannot lie -- "it is so real that I am present." This heuristic is said to be triggered when the mediated presentation closely approximates physical reality and thereby provides a compelling experience (Sundar, Kang & Oprean, p. 673).

While the MAIN model focuses on each of these three heuristics (being there, interaction, and realism) as representations of immersion, it also asks participants to judge credibility of a message as mediated by technology, which was not the aim of the SUS questionnaire used to assess immersion in the experimental design of my study. Instead, the SUS Presence Questionnaire examines immersion as a process of self-reported sense of presence in a virtual environment which is made up of sense of being in the VE, the extent that the VE becomes reality, and the extent that participants remember the VE as 'place' (Usoh et al., 2018, p. 10).

Also, while the condition groups of Sundar, Kang & Oprean (2017) are quite similar to the ones designed in my thesis, there are a few methodological distinctions to point out when it comes to discussing the overall design of and need for the research in this thesis. Most obviously, there are differences in conditions for the Schutte & Stilinovic (2017) study, which had two condition groups and no print condition of the same story. To compare conditions of VR vs. a traditional video, the researchers offered an edited version of the 360° video "Clouds Over Sidra" to present it in a "two-dimensional format" for their control group participants to view using the same Samsung headset they gave the VR group to watch (Schutte & Stilinovic, 2017, p. 710). That meant that participants in their study all had to use wearable technology and that the condition of the story was always in a visual medium as opposed to a print medium, which might have added to the feeling of novelty of the new technology during the experiment, where only the HMD VR condition of my study had participants wearing headsets. Additionally, being that the study was a pilot, it had a smaller sample population (n= 24) whereas the sampling population in this study was (n= 45).

Furthermore, and perhaps most importantly, both key studies also lack measures for individual's empathetic capacity (Toronto Empathy Questionnaire), personality disposition (Five

Factor Model of Personality), political ideology (Ideological Consistency Scale), and media consumption habits (News Consumption Questionnaire), which were each addressed by this study as possible mediating factors towards the empathy felt for subjects of the news story and prosocial behavior towards those affected by the refugee crisis. These are key decisions made for this thesis to help further isolate the many circumstances of news consumption by individuals that may change personal responses to the news and which I think are greatly lacking address in both 2017 studies.

Another notable distinction between the approaches of Sundar, Kang & Oprean (2017) and Schutte, Stilinovic (2017) and my thesis was the choice of language identifying the empathetic target of the empathy questionnaires. In both studies the empathetic target was determined by who the individuals in the stimulus documentaries were (Sidra in "Clouds Over Sidra" and Oleg, Chuol and Hana in "The Displaced"). In my study, more general language for the empathetic target "those affected by the refugee crisis" was used to ask about perspective-taking. This distinction was made intentionally in my experimental design in keeping with the journalistic tradition of having subjects of a story stand-in for larger societal issues - in this case, the refugee crisis (Craig, 2003, p. 802).

Research Question and Hypotheses

This thesis includes a pre-test post-test experimental design with three groups of participants, each randomly assigned, and convenience sampled to answer the following research question and hypotheses:

- Overarching research question: Does virtual reality journalism increase empathy and by extension prosocial behavior in news audiences?

- Hypothesis 1: There is a positive relationship between a participant's level of immersion in "The Displaced" and that participant's level of empathy for those affected by the refugee crisis (see table 1, p. 46).
- Hypothesis 2: Differences in levels of reported immersion with "The Displaced" are related to the medium of story (print, click-through VR, HMD VR) (see table 2, p. 47).
- Hypothesis 3: Prosocial behavior towards those affected by the refugee crisis from participants who view "The Displaced" was influenced by overall feelings of empathy (perspective-taking) for those affected by the refugee crisis introduced in the news story (see table 3, p. 48).
- Hypothesis 4: The participant's baseline personality disposition, empathetic capacity, and political ideology will have a relationship to prosocial behaviors towards those affected by the refugee crisis like the subjects of "The Displaced" (see table 4, p. 49).

METHOD

After completing pre-test measures on political beliefs, baseline levels of empathetic capacity, personality disposition and demographic questions like age and gender each of the groups assigned were given *The New York Times* documentary and long-form story "The Displaced" in a variety of medium conditions, and asked about their overall feelings of immersion, perspective-taking, and inclination to perform prosocial behaviors.

Rationale for experimental design

The design of this experiment as a pre-test post-test experimental design is beneficial so that the content of the questionnaires and the viewing/reading the stimulus material can get done in a reasonable time frame, thus addressing the possibility of overwhelming participants who may become fatigued after a set period participating in the study. Additionally, the conditions of the groups have been modeled in other research, giving greater confidence to the design of the medium conditions. This model is one that has been tried using the same stimulus documentary, "The Displaced," because of the content being available in print as well as in click-through and HMD VR (Sundar, Kang & Oprean, 2017). Careful attention was paid to not priming participants to the subject of the study during the pre-test phase by adding a waiting period between pre-test and post-test questionnaires, so as not to leave the questions fresh in the minds of participants.

Measurements

This experimental design makes use of the following measures which are made available later in the appendix of this thesis.

- Descriptive Demographic Questions
- News Consumption Questionnaire (Pew Research Center, 2018)

- SUS Presence Questionnaire (Usoh, Catena, Arman & Slater, 2000)
- Five-Factor Model of Personality (McCrae & Oliver, 1992)
- Toronto Empathy Questionnaire (Spreng, McKinnon, Mar & Levine, 2009)
- Ideological Consistency Scale (Pew Research Center, 1994)
- Helping behaviors scale (Adapted from Thompson, 2015)
- Perspective-taking questionnaire (Schutte & Stilinovic 2017)

Descriptive Demographic Items

Demographic questions on race, age, and gender, languages spoken, and travel habits have been added to the pre-test to describe the population of participants better, especially because there may be differences in gender and empathetic capacity, helping behaviors, and political ideology.

Example item: "What is your gender identity?"

Responses: "Male, Female, Other (please list) _____"

News Consumption Questionnaire

A news consumption questionnaire adapted from the Pew Research Center (2018) provides a comprehensive list of news outlets and a measure of levels of trust in each outlet. This is used to better understand two key things: whether or not the participants regularly consume news from *The New York Times* (which produced the documentary, "The Displaced") and whether their trust in *The New York Times* accuracy in reporting could prove a confounding variable in the research (i.e. if participants indicate a low level of trust in the outlet, that might be a confounding variable to their overall reaction to the material viewed in the experiment).

Example item: "Which of the following sources do you regularly get news from about international news? (Select all)."

Responses: “1-Brietbart, 2-Fox News, 3-Drudge Report, 4-The Sean Hannity Show, 5-The Economist, 6-The Wall Street Journal, 7-The Blaze, 8-Google News, 9-BBC, 10-USA Today, 11-ABC news, 12-The Rush Limbaugh show, 13-CNN, 14-PBS, 15-CBS News, 16-NBC News, 17-The Guardian, 18-Yahoo News, 19-NPR, 20-Bloomberg, 21-The Washington Post, 22-MSNBC, 23-The New York Times, 24-The New Yorker, 25-Politico, 26-The Huffington Post, 27-Slate, 28-The Daily Show, 29-Buzzfeed, 30-Mother Jones, 31-Daily Kos, 32-The Ed Schultz Show, 33-ThinkProgress, 34-Vox, 35-VICE, 36-The Intercept”

SUS Presence Questionnaire

To analyze the self-reported feelings of presence that are often felt in the process of immersion, items from the SUS presence questionnaires from Slater, Usoh, Steed et al. (1999) were employed as a means of measuring presence felt in all three conditions of the story medium (print, click-through VR, HMD VR). As defined by these researchers, presence refers to sense of environment or virtual environment (VE). Necessary conditions for presence include focus or attention to place via involvement. As explained in the Usoh, Catena, Arman & Slater (2000) study, “Using presence questionnaires in reality,” there are a few aspects that contribute to presence as measured by the SUS questionnaire. “This is based on several questions all variations on one of three themes: the sense of being in the VE, the extent to which the VE becomes the dominant reality, and the extent to which the VE is remembered as a ‘place.’”

Example item: “How responsive was the environment to actions that you initiated (or performed)?

Responses: 1= Not responsive, 3.5= Moderately Responsive, 7=Completely Responsive

The Toronto Empathy Questionnaire

The Toronto Empathy Questionnaire (TEQ) began as a response to an overabundance of measuring tools for empathy convoluting the process of analyzing empathy levels in research. The TEQ combines the commonalities of other scales such as the Interpersonal Reactivity Index (IRI), the Questionnaire Measure of Emotional Empathy (QMEE), The Empathy Scale, the Balanced Emotional Empathy Scale, and the Empathy Quotient (EQ), among others (Spreng, McKinnon et al, 2009). The TEQ measures empathy as a primarily emotional process and has been demonstrated in three different replications by the researchers who developed it to have "strong convergent validity, correlating positively with behavioral measures of social decoding, self-report measures of empathy, and negatively with a measure of Autism symptomatology." Additionally, the researchers report that the TEQ "exhibited good internal consistency and high test-retest reliability" (Spreng, McKinnon et al., 2009). The TEQ attempts to make a consensus of other scales for empathy in a process that is easy to administer to participants as a brief self-report, making it attractive for the purposes of this thesis. There are several aspects of empathetic capacity that are addressed in the TEQ's different items, including emotional mirroring, emotion comprehension, demonstrating appropriate sensitivity, sympathetic physiological arousal, con-specific altruism, and frequency in engaging in prosocial helping behaviors. (Spreng, McKinnon, et al., 2009).

Example item: "I have tender, concerned feelings for people less fortunate than me"

Responses: Never = 0; Rarely = 1; Sometimes = 2; Often = 3; Always = 4

The Five-Factor Model of Personality

The Five-Factor Model of Personality, sometimes referred to as the FFM but referred to more commonly as the Big 5 is a personality assessment that argues that people often fall into

the following 5 disposition types: Extraversion, Agreeableness, Conscientiousness, Neuroticism and Openness to Experience/Intellect. The Five-Factor model is a replicable model of disposition and personality most often used in the field of psychology. As such, the Big 5 provides a model for which to base "systematic exploration of the relations between personality and other phenomena" (McCrae & Oliver, 1992, p. 206). This measurement proves particularly relevant to this thesis as a measure of general baseline disposition of participants.

Example item: "I am not interested in other people's problems."

Responses: 1= Strongly Agree, 2= Agree, 3= Neither agree nor disagree, 4=Disagree, 5= Strongly Disagree

Ideological Consistency Scale

The Ideological Consistency Scale (Pew Research, 1994) measures the extent to which people offer mostly right-leaning or left-leaning political views on a variety of political issues covered within the landscape of the news. These views are selected for a traditional dichotomous conservative/liberal association. "Our purpose here is to study the concept of ideological "consistency" – or the share of Americans who hold liberal or conservative views across a range of value dimensions; this is also sometimes referred to as "ideological constraint" or "ideological sorting" by political scientists and other researchers" ("Ideological Consistency Scale," 2014). The Ideological Consistency Scale has been used by Pew Research Center since 1994 to assess the political ideology of the American public. Within this thesis, the Ideological Consistency scale is useful to assess participant's views on immigration and refugees and any inherent biases or attitudes that may exist around this population. Additionally, including these items in both pre and post-tests will allow for a marker of any changes in attitude as a result of exposure to the stimulus, "The Displaced."

Example item: “Immigrants today are a burden on our country because they take our jobs, housing and health care”

Responses: 1= Strongly Agree, 2= Agree, 3= Neither agree nor disagree, 4=Disagree, 5- Strongly Disagree

Helping behaviors Scale

The scale in this thesis measuring prosocial behaviors is modified from the 2015 thesis, published under the Colorado State University Journalism Department “Helping behaviors during disaster reporting stages: A measure of innate and conditioned differences in empathy and compassion generation” which asked participants to assess their willingness to donate to a natural disaster relief related cause after exposure to reporting on natural disasters. This measure was modified in the research posed here to include two questions: one on willingness to donate to refugee relief funds, and another on willingness to become involved in an organization that supports the interest of refugees. These items have been added to reflect a sliding scale in terms of the level of commitment to behaving in a prosocial manner for anything ranging from being willing to talk about and therefore raise awareness of an issue, or give money to the cause, all the way to volunteering time in the name of that cause. This was helpful to assess whether more empathetic individuals were more likely to engage in prosocial behavior after exposure to the stimulus.

Example item: “A local organization, Rams for Refugees is working to provide relief help to those affected by the refugee crisis. Would you be willing to donate to this organization?”

Responses: 1= Not likely, 2= Somewhat likely, 3= Very likely

Perspective-Taking Scale

Based off the Schutte & Stilinovic (2017) scale which was an adaptation of the original perspective-taking scale items of the Interpersonal Reactivity Index (Davis, 1984), several questions aimed at assessing participant's ability to take the perspective of those affected by the refugee crisis, like the subjects in "The Displaced" were analyzed. The Perspective-Taking scale employed in this thesis is situational and was used to describe broadly the subjects themselves.

Example item: "I sometimes try to understand those affected by the refugee crisis better by imagining how things look from their perspective"

Responses: 1= Does not describe me well 5= Describes me very well

Researcher Reflexivity

As a researcher, I expected that certain political beliefs against immigrants (as measured by the Ideological Consistency Scale) may also indicate a lower probability towards empathy or prosocial behaviors toward refugees. Additionally, I expected certain personality dispositions such as extraversion and openness to new ideas to correlate with willingness to perspective-take with the subjects in "The Displaced." These are the sorts of statistical relationships I expected to find in the data across comparison of the means, standard deviations and the like. I also expected that individuals with the lowest empathetic capacity levels measured by the TEQ have the highest chance of empathetic growth when measured with the perspective-taking scale, because they have more room to become empathetic towards the subjects if immersion is truly a mediating effect.

Hypotheses visualized

Table 1

Hypothesis 1

Research Hypotheses:	Concepts / Variables:	Theoretical/Operational Definitions:
Hypothesis 1 There is a positive relationship between a participant's level of immersion in "The Displaced" and that participant's level of empathy for those affected by the refugee crisis.	IV_1- Immersion through SUS Presence Questionnaire (Slater, Usoh Steed et al, 1999)	The SUS Questionnaire was developed by Slater, Usoh and Steed to measure presence specifically within virtual environments (VE).
	DV_1- Empathy for subject of story through Perspective-taking (PT) (Davis 1984)	Perspective-taking is one aspect of the Interpersonal Reactivity Index, or IRI which assesses an individual's ability to take the emotional perspective of someone external to them (Davis 1984).

Table 2

Hypothesis 2

Research Hypotheses:	Concepts / Variables:	Theoretical/Operational Definitions:
Hypothesis 2 Differences in levels of reported immersion with "The Displaced" are related to the medium of story (print, click-through VR, HMD VR).	IV_1- Immersion through SUS Questionnaire	The SUS Questionnaire was developed by Slater, Usoh and Steed to measure presence specifically within virtual environments (VE).
	DV_1- Medium of "The Displaced" via: -Print -Click-through VR -HMD VR	Participants were asked to read "The Displaced" via the online long-form print story on nytimes.com, or view the click-through VR version of "The Displaced" on nytimes.com, or view "The Displaced" using an HMD such as Oculus Rift

Table 3

Hypothesis 3

Research Hypotheses:	Concepts / Variables:	Theoretical/Operational Definitions:
Hypothesis 3 Prosocial behavior towards those affected by the refugee crisis from participants who view "The Displaced" was influenced by overall feelings of empathy (perspective-taking) for those affected by the refugee crisis introduced in the news story.	IV_1- Empathy for subject of story through Perspective-taking (PT) (Davis 1984) DV_1- prosocial behaviors (Thompson 2015)	perspective-taking is one aspect of the Interpersonal Reactivity Index, or IRI which assesses an individual's ability to take the emotional perspective of someone external to them (Davis 1984). Participants were asked about a variety of prosocial behaviors such as donating to charity, becoming involved with a nonprofit organization, telling a friend about refugees and so on using a modified questionnaire from the Thompson (2015) study.

Table 4

Hypothesis 4

Research Hypotheses:	Concepts / Variables:	Theoretical/Operational Definitions:
Hypothesis 4 The participant's baseline personality disposition, empathetic capacity, and political ideology will have a relationship to prosocial behaviors towards those affected by the refugee crisis like the subjects of "The Displaced."	IV_1- Personality dispositions measured with the Big 5	5 disposition types: Extraversion, Agreeableness, Conscientiousness, Neuroticism and Openness to Experience.
	IV_2- Empathetic capacity measured with the TEQ	The Toronto Empathy Questionnaire levels individual differences in overall empathetic capacity.
	IV_3- Political beliefs measured with the Ideological Consistency Scale	The Ideological Consistency Scale measures left-leaning or right-leaning political values through a scale of political issues
	DV- Helping behaviors towards those affected by the refugee crisis (helping behaviors scale)	Participants were asked about a variety of prosocial behaviors such as donating to charity, becoming involved with a nonprofit organization, telling a friend about refugees and so on using a modified questionnaire from the Thompson (2015) study.

Stimulus

The virtual reality journalism piece I used for my study is *The New York Times* 360° news package "The Displaced" published Nov. 5, 2015, the documentary follows the lives of three refugee children: Oleg who was born in Ukraine, Chuol who was born in South Sudan, and Hana who was born in Syria.. The piece is available both in print and in virtual reality video as a

documentary-style VR video walking through the lives of the three children subjects. The news story being presented in both text and VR form makes "The Displaced" an ideal choice of stimulus message, because it is easy to look at medium of story as a factor since the content itself in the documentary remains unchanged.

Study Design Notation

R

G1: O_1 X_1 O_2 (X = print)

G2: O_3 X_2 (X = click-through VR) O_4

G3: O_5 X_3 (X = HMD VR) O_6

*N = 45, n = 15

Pre-test measures, post-test measures

Pre-test measures include measures that are not considered dependent variables in any of the hypotheses in this thesis. These measures were administered upfront via Qualtrics (described in more detail later in this thesis):

- Five-Factor Model of Personality (McCrae & Oliver, 1992)
- Toronto Empathy Questionnaire (Spreng, McKinnon, Mar & Levine, 2009)
- Ideological Consistency Scale (Pew Research Center, 1994)

Whereas post-test measures were administered prior to exposure to the stimulus activity. These measures were administered by me as a research proctor upon completion of the stimulus activity:

- SUS Questionnaire (Usoh et al., 2000).
- Prosocial behaviors scale (Adapted from Thompson, 2015)
- Perspective-taking questionnaire (Schutte & Stilinovic, 2017)

Groups/conditions

The first group was assigned to read *The New York Times* story "The Displaced," from nytimes.com. The second group was assigned the same story, "The Displaced" to navigate the 360-video using a mouse and internet browser on YouTube to click around to 'look around' in the video. The third group was assigned to watch "The Displaced" using a Samsung Gear VR headset.

Participants

Participants were sampled from the nearest available population of college-level adults at Colorado State University using a convenience sample and employing recruiting help from SONA, the CSU journalism department sampling system that includes a database of students who may agree to participate in department research in exchange for a few extra credit points in their courses.

Recruiting

Population / Who qualifies?

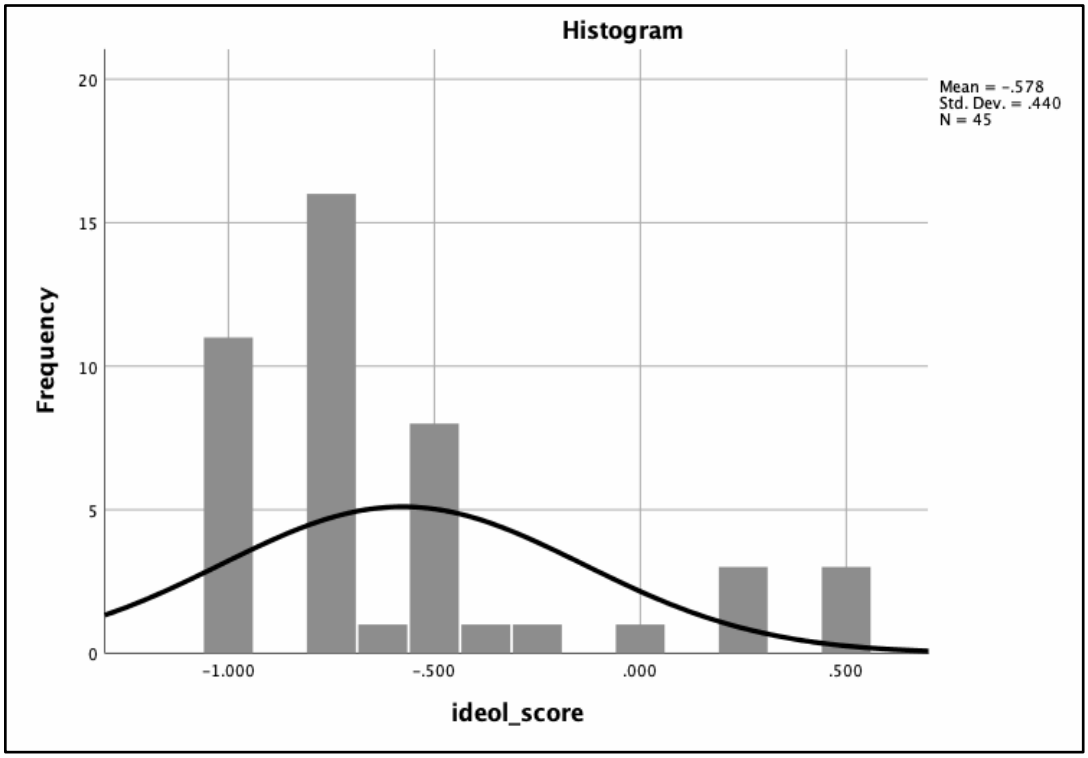
To qualify for this study, participants had to be at least 18 years of age, English speaking, and to have sought out news articles or news media in their lives. Additionally, participants were tested for their trust in news materials from a variety of news outlets, including *The New York Times,* to test for a lack of trust in that news organization that might otherwise present itself as a confounding variable in the study. Participants were also asked about their usage and familiarity with VR and especially VR journalism, but the answers to those items were not disqualifying and were only used to contribute to the limitations section of this thesis, to add to the understanding of whether or not a high percentage of the population in this study are familiar with VR technology.

Sampling Scheme / Recruiting

Participants were recruited using SONA to incentivize participation via extra credit for college courses randomly assigned groups of n = 15 per condition (print, click-through VR, and HMD VR) from the convenience sample via SONA. Participants recruited via SONA were incentivized with a small amount of extra credit as part of the overall SONA system. The total number of participants that identified their gender as male was n= 16 and the number of those who identified as female was n= 29. Overall, the mean age of respondents was 20.71, and respondent ages did not distribute evenly on a curve as demonstrated below. The total number of participants who identified as White was n= 41, Black or African American was n= 2, biracial n=1, and Asian n=1, however, a linkage between these concepts was not tested in the statistical analysis of this thesis, beyond the descriptive question of ethnic identity. The mean score within the 45 participants in this study was -.578, showing that the average participant in the study falls within the mostly liberal range (Figure 1).

Figure 1

Histogram and standard deviation curve of political ideology scores among participants



Several questions were asked in the post-test to help identify possible modifiers including questions about media consumption and level of trust in media outlets, questions about participants' travel habits, and questions about mastery of different languages. Participants were asked about trust in and frequency of consumption of *The New York Times* in to assess whether or not individuals with particularly high rates of consumption of the outlet, or participants with low trust in the outlet would view the stimulus material differently. Individual travel habits were assessed to ensure that participants had not travelled to the countries of origin for each of the refugees in "The Displaced." This ended up being a non-issue as none of the participants indicated they had traveled to Sudan, Syria, or Ukraine. Furthermore, none indicated they spoke the native language of the refugees in "The Displaced" meaning that there was no need to control for these potential modifiers due to characteristics of the convenience sample population. As

with all experiments with a smaller sample size such as in this thesis (n= 45), these results are not generalizable to the general public.

Procedure

1. Possible participants may opt in and sign informed consent forms via the SONA recruiting tool.
2. Participants were given the pre-test measures including the Five-Factor Model of Personality (McCrae & Oliver, 1992), the Toronto Empathy Questionnaire (Spreng, McKinnon, Mar & Levine, 2009) and the Ideological Consistency Scale (Pew Research Center, 1994) and instructed to complete these items and questionnaires..
3. After completion, participants were randomly assigned to one of three groups of 15 participants (where $n = 15$ and $N = 45$) with the following conditions (print, click-through VR, or HMD VR).
4. Groups 1 through 3 were administered the stimulus material "The Displaced" in the following medium conditions (print, click-through VR, HMD VR).
5. After exposure to "The Displaced," participants were post-tested using the prosocial behaviors assessment (Thompson, 2015), and the perspective-taking questionnaire (Schutte & Stilinovic 2017), and the Presence Questionnaire (Slater, Usoh, Steed et al 1999)
6. Participants were seen out.
7. Participants were debriefed on the experiment via email.

Pilot studies

A pilot test of the above conditions for Group 3 (HMD VR condition) was conducted to pull preliminary results on level of immersion in VR as well as to determine if sympathy needed

to be brought in as an additional measure (this was not the case as looking at empathy alone yielded compelling results).

Additionally, another pilot test was conducted to survey participant's existing knowledge or ignorance of VR journalism, as well as to have participants try out a Gear VR HMD headset with a *New York Times Daily 360* video to see whether they feel that VR journalism is a compelling reason to purchase a VR HMD headset. This second pilot test was done in conjecture with my Communication and Innovation class with Dr. Kris Kodrich, and the results and discussion of the final paper's findings on what barriers to adoption VR technology faces from a diffusion of innovation theoretical background helped to inform later recommendations practical applications in the field of journalism.

More insights from the pilot test

Other insights were uncovered as well via a small pilot test prior to the formal experiment at the center of this thesis. An informal interview was conducted among participants who were given a Samsung Gear VR headset with a VR video from the Daily 360 series and asked questions about their experience with this technology. Very few respondents were familiar with VR journalism works of any kind, and so for many, watching an NYT Daily 360 video was a wholly new experience and way of thinking about applications for virtual reality technology. Firstly, VR's uncanniness came up, or the idea that the slight difference between reality as represented in VR and reality as we perceive it in day-to-day life can disturb the viewer due to this shift in perspective. One 19-year-old male participant seemed to hint at this, saying: "The quality of the video or the quality of the technology is something. This should be more like my vision and not lagging." Furthermore, the cost came up quite a bit. One 20-year-old female participant put bluntly: "It's too expensive for something I wouldn't use enough to justify the expense." Some

noted perceptions that the technology had no staying power: “I mean I guess I don’t seek out a lot of VR and I don’t see it a lot in my media streams. It felt like a fad as far as my viewing consumption was concerned,” said a 21-year-old female participant. Consistently, when pressed with the question, “what uses could you imagine for VR?” journalism was not at the forefront of pilot testers’ minds. Instead, the most common application noted was for video games. “I think that, as someone who plays a lot of video games, it is a great leap towards a new frontier of gaming that has seemingly endless possibilities,” said a 21-year-old male. However, some participants did note that they could see other journalistic applications for VR after watching a Daily 360 video. One 26-year-old female respondent noted how VR could be used to cover natural disasters: “I think it could be used really well for like the fires in California right now, to get a firsthand experience for us in Colorado who don’t know what it’s like out there.” (at the time the California wildfires were a particularly timely news story). Finally, a few subjects expressed concern for the potentially graphic uses they could theorize for VR technology. “There are certain things I don’t think I would want to see in VR, like a car accident,” said one 18-year-old female participant.

Data analysis

The data on level of immersion was sorted into different groups depending on the medium employed and was compared using Tukey’s HSD test (difference between means). The data results were then filtered to reflect participant’s answers on the TEQ, Big 5, and Ideological Consistency Scale to analyze how individuals with certain political beliefs, empathetic capacities, and personality dispositions performed on perspective-taking. Additionally, data was analyzed for standard deviations and means.

Reliability

To remain reliable, this thesis has made a sincere effort to build off current measures and questionnaires for the phenomena it attempts to measure including empathy, immersion and presence, political ideology, perspective-taking, and prosocial behaviors. Post- data collection, the variables from all these measures (Toronto Empathy Questionnaire, SUS Presence Questionnaire, Ideological Consistency Scale, Five Factor Model, Helping Behaviors Scale) were statistically tested for their overall reliability using Chronbach's alpha. The results indicated high reliability with all scales, with Chronbach's alpha scores listed as follows:

Table 5

Reliability scores for pre and post-test measurement scales/questionnaires

Measurement Scale	Chronbach's Alpha	N of items
Toronto Empathy Questionnaire	.812	16
SUS Presence Questionnaire	.927	6
Ideological Consistency Scale	.696	8
Five Factor Model of Personality	.675	20
Helping Behaviors Scale	.845	6

Ethical Considerations

Because the research involves human subjects, the Colorado State University Institutional Review Board had an opportunity to weigh in on the research. For the experiment, any personally identifiable information was kept confidential, and data pertaining to subjects was not shared, however as with all research, there is always a possibility of a data breach. Because of

this concern, I have taken preventative measures to remain in line with the university's policy on data storage:

> Sensitive data in individuals' files should be kept to a minimum, and reasonable and prudent protection of those files shall be implemented by the system administrator. Files containing significant amounts of sensitive data not stored on portable devices must be protected with strong encryption. As currently interpreted by government regulations and industry standards, "strong encryption" means either the Triple Data Encryption Standard (3DES) or the Advanced Encryption Standard (AES) (CSU Policy Library, 2016).

Additionally, steps were taken to depersonalize the information in the data so that it was not identifiable to any one individual even in the case of a data breach, and all data I collected was password protected and encrypted.

Possible harm

Due to the somewhat sensitive nature of the subject of "The Displaced" participants were briefed on the potential psychological harm that may result from being exposed to the material. Although there is nothing particularly egregious or graphic about the material in the documentary or story, it was important to disclose that refugees were shown so that participants could make an informed choice to consent to being studied. This was particularly important in case the stimulus materials brought up any trigger for someone who may have mental health issues spurred by a traumatic experience in their life, especially if those participants are refugees or come from a refugee or immigrant background. Additionally, some research has suggested that a possible side effect of VR is motion sickness, and that this side effect can cause nausea, especially to women (Munafo, Diedrick & Stoffregen, 2017, p. 895). In general, the possible health effects of VR need further study, and so it was important to mention VR's connection to nausea, as well as some issues with photosensitivity and epilepsy. Participants were informed about these types of risks while taking part in the research as part of their consent to participate.

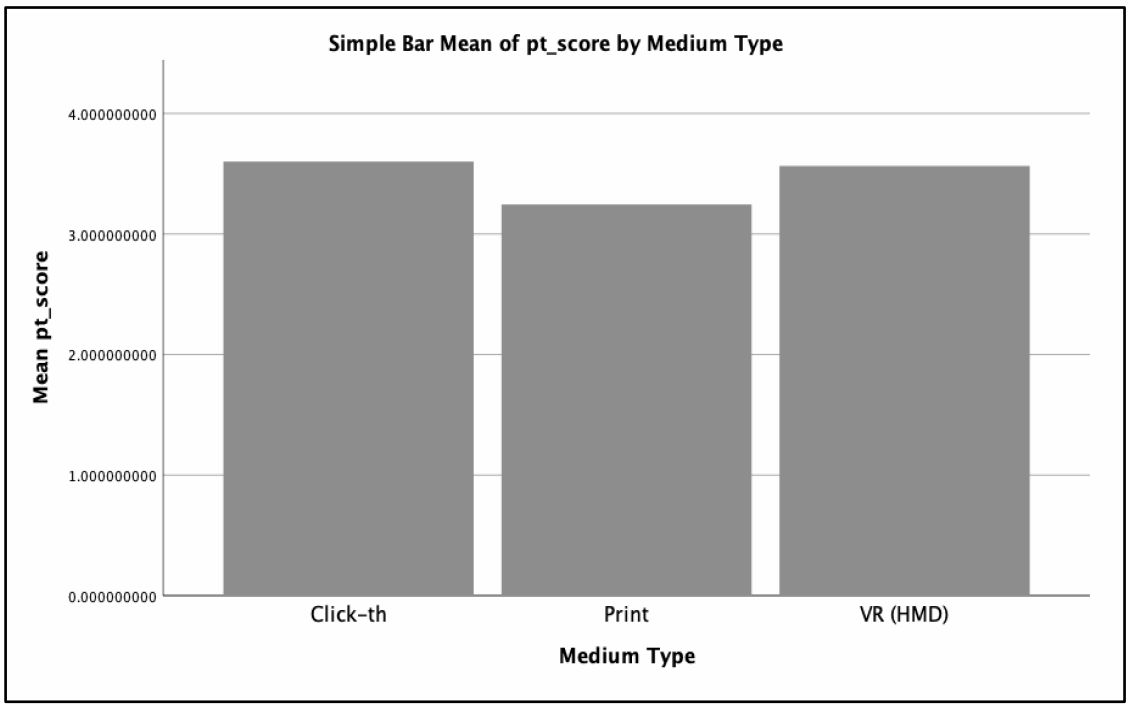
RESULTS

Research Question Analysis

Recalling the overarching research question of this thesis, "Does virtual reality journalism increase empathy and by extension prosocial behavior in news audiences?" the results of a one-way ANOVA and Tukey HSD test showed no statistically significant relationship between virtual reality journalism and empathy nor any relationship between virtual reality journalism and prosocial behavior in news audiences. To analyze, this research question was broken into two key parts. Part one: "does VR journalism affect empathy in news audiences?" which was operationalized with perspective-taking as the dependent variable and condition (medium of "The Displaced" being either HMD VR or click-through VR) as the independent variable. Part two of the question was broken down as follows: "does VR journalism affect prosocial behavior in news audiences?" where the independent variable was again condition and the dependent variable was the score on the adapted (Thompson, 2015) helping behaviors scale. After a test on the variables of condition and perspective-taking, there is little evidence of a significant relationship between the condition participants were assigned to (print, click-through VR, and HMD VR) and their self-reported level of perspective-taking ($p = .125$).

Figure 2

Bar chart of perspective-taking scores by medium of "The Displaced"



Additionally, the standard deviations of perspective-taking scores among each of the condition groups did not vary greatly, although the condition group with the widest range of perspective-taking scores was HMD VR which had a mean of 2.564 and a standard deviation of .597.

Table 6

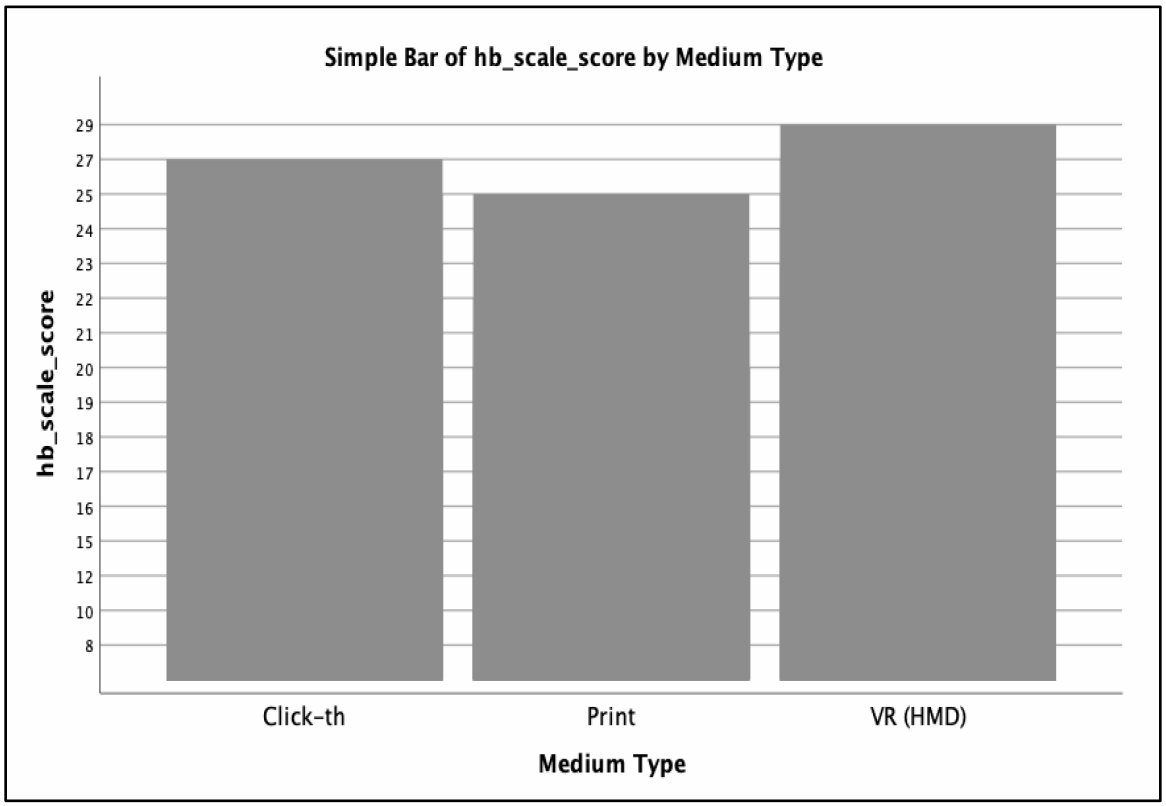
Standard deviations of perspective-taking scores by medium type

Medium Type	Mean	N	Std. Deviation
Click-through VR	3.6000000	15	.435525590
Print	3.2444444	15	.491461485
VR (HMD)	3.5644444	15	.597277775
Total	3.46962963	45	.526174599

Further, an additional one-way ANOVA and Tukey's HSD test found a weak evidence for a significant correlation between condition and helping behaviors (p= .236), which also didn't support the conclusion that participants' reported willingness to behave helpfully towards the subjects of the stimulus documentary is related to the condition in which each participant consumed "The Displaced." Further, a standard deviation analysis among all three conditions did not differ widely, though once again, the largest variance in helping behaviors scores was in the HMD VR condition (5.367), followed by print (5.083) and then finally click-through VR (4.743). In conclusion, the answer to the research question "does VR journalism increase empathy and by extension prosocial behavior?" is no on both counts.

Figure 3

Bar chart of helping behavior scores by medium of "The Displaced"



Hypothesis 1 Analysis

After a statistical analysis was performed to analyze the first hypothesis, it was determined that there was no relationship between news audience immersion, and their empathy, as measured by their perspective-taking scores. To analyze whether or not there is a positive relationship between a participant's level of immersion in "The Displaced" and that participant's level of empathy for those affected by the refugee crisis, a linear regression was performed. Analysis found little evidence to suggest a significant relationship (p= .878) between how immersed participants felt after watching or reading "The Displaced" and their ability to take the perspective of the subjects in the story. Therefore, the null hypothesis was confirmed.

While ANOVA and Tukey HSD testing did not yield significant results for this in my study, it is notable that marginal evidence was found that the overall condition of the print, click-through VR, and HMD VR groups had differences in mean scores for perspective-taking with print participants showing the lowest scores for perspective-taking overall despite the effect being much smaller and not statistically significant (print: 3.2444444), then (HMD VR: 3.5644444) and then (click-through VR: 3.6000000).

Hypothesis 2 Analysis

Next, a test on the assumptions of hypothesis two confirmed that different conditions had different levels of reported immersion associated with them. To begin the analysis, a one-way ANOVA and Tukey HSD test was performed. This analysis found a significant relationship (p= .010) between the mean level of immersion participants felt depending on the condition in which they read or watched "The Displaced" (print, click-through VR, HMD VR). The difference in mean level of immersion between those who watched "The Displaced" with HMD and those who read the print story was also supported (p= .013) one-sided hypothesis test (.0065). Further,

the difference in the means of immersion level between the click-through VR group and the print group is also significantly supported (p= .041) one-sided hypothesis test (.0205). However, the difference between those with HMD and click-through VR was not significantly evident (p= .912).

Table 7

Tukey HSD table of immersion score by condition

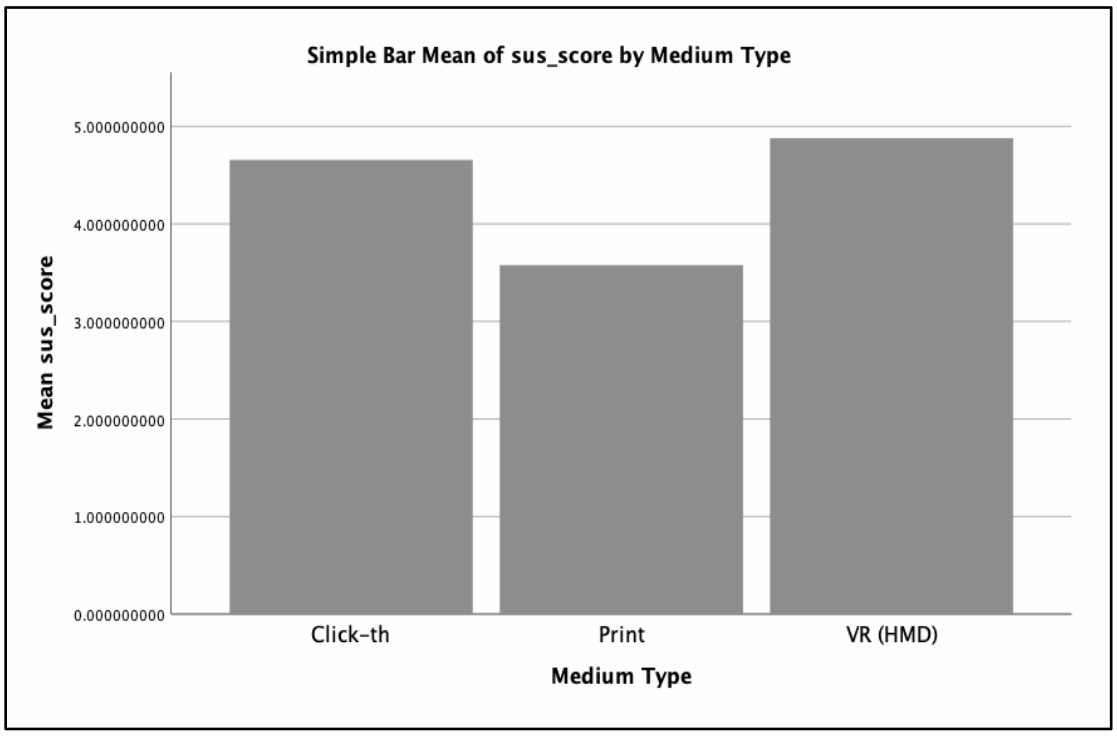
condition					95% Confidence Interval	
(I)	(J)	Mean Difference (I-J)	Std. Error	Sig.	Lower Bound	Upper Bound
1 (HMD)	2	.243650794	.596545152	.912	-1.2069388	1.69424035
	3	1.7444444	.586169662	.013	.319084460	3.16980443
2 (Click-through)	1	-.24365079	.59654152	.912	-1.6942403	1.20693876
	3	1.5007937	.596545152	.041	.050204097	2.95138320
3 (Print)	1	-1.7444444	.586169662	.013	-3.1698044	-.31908446
	2	-1.500794	.596545152	.041	-2.9513832	-.05020410

In the standard deviation calculations by each variable, the largest standard deviation of means was on the print condition, meaning that participants who read “The Displaced” in print had the greatest variance in immersion scores (1.789). Those who viewed “The Displaced” in either form of VR journalism (HMD or click-through) had closer deviation scores (1.221 for HMD VR) and (1.268 for click-through VR). Therefore, hypothesis two is partially confirmed because the level of immersion does have a significant relationship to VR journalism but did not

increase with a strong continuous positive relationship from print to click-through to HMD as originally hypothesized.

Figure 4

Bar chart of immersion (SUS) scores by medium type of "The Displaced"

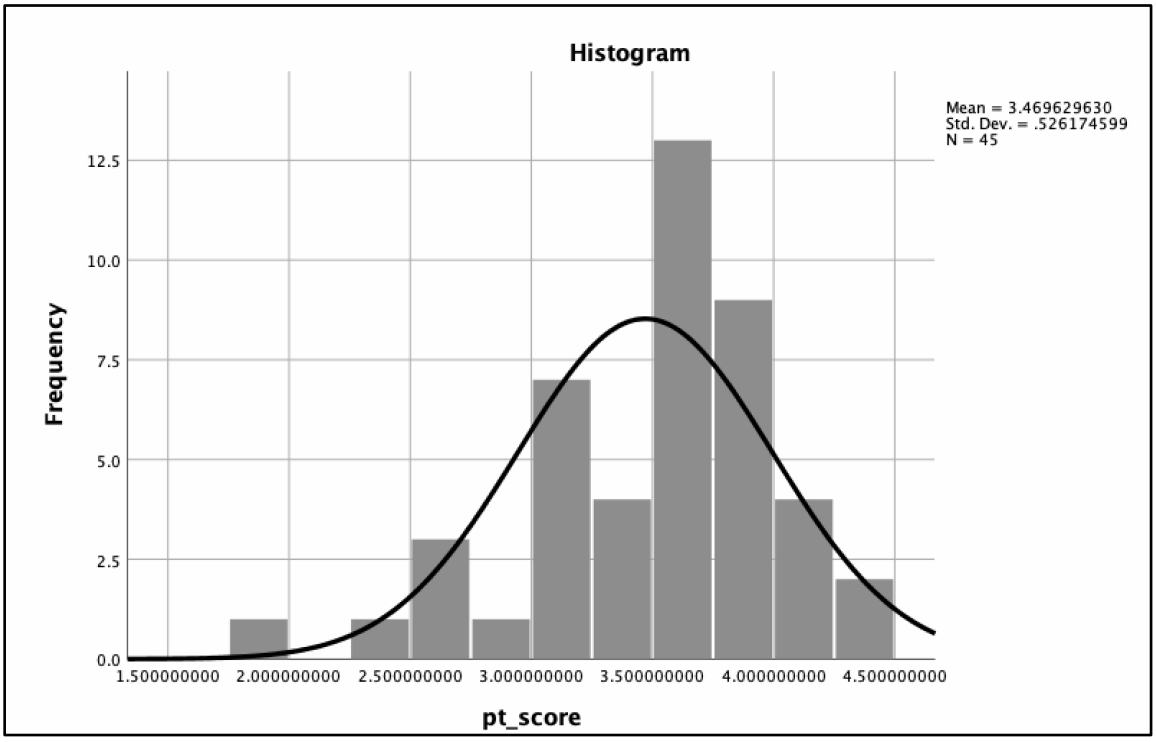


Hypothesis 3 Analysis

Next, a linear regression analysis and one-tailed hypothesis test confirmed that helping behaviors towards those affected by the refugee crisis from viewers of "The Displaced" was influenced by overall feelings of empathy (perspective-taking) for the subjects of the story. The data indicates a significant positive relationship between a participant's perspective-taking and helping behaviors score (p= .005) one-tailed test (0.025). In other words, the higher the level of perspective-taking participants reported via self-assessment, the likelier they were to engage in helping behaviors on an increasingly involved scale starting with rating their likelihood to tell a friend about the refugee crisis all the way to donating their time to a refugee-related cause. Therefore, hypothesis three can be confirmed due to the evidence of a significant positive relationship between empathy and helping behaviors among participants of the experiment.

Figure 5

Histogram of range of perspective-taking scores with standard curve



Hypothesis 4 Analysis

A multiple linear regression analysis confirmed that certain aspects of personality disposition as measured by the five-factor-model and empathetic capacity as measured by the TEQ each had significant relationships to participant's willingness to behave helpfully towards those impacted by the refugee crisis. Then, a simple linear regression confirmed that political ideology of subjects (as measured by the ideological consistency scale) also had a significant relationship with helping behaviors. To keep the concepts within the hypothesis separate and due to the series of independent variables at play a multiple linear regression was first performed on all items of the five-factor model of personality, then all items of the TEQ (empathetic capacity) and finally, a simple linear regression was performed to assess the relationship between helping behaviors and political ideology. Next, to ensure that the data collected was not skewed due to

multicollinearity, a Pearson Correlation was performed which showed p scores all under ± .8, meaning that these different variables did not appear to measure the same aspects of personality, nor of empathy.

Table 8

Pearson Correlations for Five Factor Model of Personality

Variable		1	2	3	4	5
extraversion	Pearson Correlation	--	.449	.071	-.181	.275
	Sig. (2-tailed)	--	.002	.642	.233	.067
agreeableness	Pearson Correlation	.449	--	.094	.141	.423
	Sig. (2-tailed)	.002	--	.538	.355	.004
conscientiousness	Pearson Correlation	.071	.094	--	-.372	.023
	Sig. (2-tailed)	.642	.538	--	.012	.880
neuroticism	Pearson Correlation	-.181	.141	-.372	--	-.061
	Sig. (2-tailed)	.233	.355	.012	--	.691
intellect	Pearson Correlation	.275	.423	.023	-.061	--
	Sig. (2-tailed)	.067	.004	.880	.691	--

Items of the FFM that pertained to agreeableness were as follows: “I sympathize with others’ feelings.”; “I am not interested in other people’s problems.”; “I feel others’ emotions.”; and “I am not really interested in others.” (see Appendix A, p. 101). This squares well with previous literature on the topic of personality disposition, that suggests that agreeableness tends to influence helping behaviors in people (Graziano, et al., 2007; Olukayode, 2013 Shah & Rizvi, 2016).

Table 9

Pearson Correlations for Toronto Empathy Questionnaire

Variable		1	2	3	4	5	6
sensitivity	Pearson Correlation	--	.404	.129	.460	.372	.025
	Sig. (2-tailed)	--	.006	.399	.001	.012	.869
altruism	Pearson Correlation	.404	--	.417	.405	.575	.208
	Sig. (2-tailed)	.006	--	.004	.006	.000	.17-
prosocial	Pearson Correlation	.129	.417	--	.567	.566	.260
	Sig. (2-tailed)	.399	.004	--	.000	.000	.084
sympathetic	Pearson Correlation	.460	.405	.567	--	.608	.526
	Sig. (2-tailed)	.001	.006	.000	--	.000	.000
mirroring	Pearson Correlation	.372	.575	.566	.608	--	.357
	Sig. (2-tailed)	.012	.000	.000	.000	--	.016
comprehension	Pearson Correlation	.025	.208	.260	.526	.357	--
	Sig. (2-tailed)	.869	.170	.084	.000	.016	--

Analysis revealed that different facets of participant's personality disposition had different relationships to participants' willingness to behave helpfully towards those affected by the refugee crisis upon exposure to "The Displaced." An analysis of coefficients after a multiple linear regression was performed and showed that there is not significant evidence of a relationship between participant's with high scores for extraversion (p= .175), conscientiousness (p= .653), neuroticism (p= .183), and intellect (p= .119) and their willingness to behave prosocially towards those affected by the refugee crisis. However, a significant positive relationship was found between participant's who scored highly for agreeableness and their willingness to behave helpfully towards those affected by the refugee crisis (p= .004) one-sided

hypothesis test (.002). Thus, part one of hypothesis four is partially confirmed as the data shows participants with a higher score for agreeableness self-reported more willingness to help those affected by the refugee crisis than those with higher scores in other aspects of personality disposition.

Part 2 of the hypothesis deals with processes of empathetic capacity as measured by the TEQ and helping behaviors. With the TEQ, participants are tested for emotional sensitivity, con-specific altruism, engagement in high-order prosocial helping behaviors, sympathetic physiological arousal, emotional mirroring, and emotion comprehension. Multiple linear regression found evidence to suggest a significant positive relationship (p= .026) one-sided hypothesis test (.013) with aspects of participants' empathetic capacity, however, not all aspects of empathetic capacity had strong evidence to support a significant relationship to helping behaviors. Notably, the aspect of empathetic capacity that did have a significant positive relationship to helping behaviors was participants with high scores for sympathetic physiological arousal (p= .034) one-sided hypothesis test (.017) and their willingness to behave helpfully towards those affected by the refugee crisis. The items of the TEQ associated with sympathetic physiological arousal included statements such as "It upsets me to see someone being treated disrespectfully," " I find that I am "in tune" with other people's moods" and "I become irritated when someone cries" on the 16-item questionnaire (see Appendix A, p. 104). Other aspects of empathetic capacity among participants were shown to have weak correlations including participant's ability to demonstrate appropriate emotional sensitivity (p= .238), con-specific altruism (p= .253), engaging in higher-order prosocial helping behaviors (p= .880), emotional mirroring (p= .635) and emotion comprehension (p= .288). Therefore, part two of hypothesis four is partially confirmed, as it seems that participants with a higher tendency to become

sympathetically aroused also tended to report more willingness to help those affected by the refugee crisis.

The final part of hypothesis four posits a relationship between political ideology and helping behaviors. To analyze this, a linear regression analysis showed a significant correlation between participants' political ideology and their willingness to behave prosocially towards those affected by the refugee crisis (p= .009), one-sided hypothesis test (.00225) confirming yet another part of hypothesis four. On the Ideological Consistency Scale, a score of 7 to 10 represents individuals who are consistently conservative, 3 to 6 represents individuals who are mostly conservative, -2 to 2 represents individuals with mixed political ideologies, -6 to -3 represents individuals with mostly liberal political ideologies, and finally, scores of -10 to -7 represent individuals who are consistently liberal on the scale. After a simple linear regression revealed a relationship between participants' ideologies and their helping behaviors, the idea that this factor does have a role in participants reported likeliness to help was borne out. That fits well into previous context from research such as Farwell & Weiner (2000), which suggested that people who exhibit more liberal ideologies tend to self-report more willingness to help.

Analysis of Possible Modifiers

In addition to the aforementioned variables analyzed in each hypothesis, a few potential modifying factors were considered in the design of the experiment, including participant's level of trust and their frequency of consumption of *The New York Times* (the news outlet that produced the story), whether or not they spoke the languages that each of the refugee subjects used in the documentary, and whether or not they had traveled to any of the countries of origin of the three subjects in the documentary.

After a linear regression was performed to assess whether or not a participant's level of trust in *The New York Times* had any moderating effects on the results of this study, no significant evidence of a relationship between a participant's trust in *The New York Times* and their perspective-taking (p= .411), emotional sensitivity (p= .130), con-specific altruism (p= .604), engagement in high-order prosocial helping behaviors (p= .562), sympathetic physiological arousal (p= .210), emotional mirroring (p = .332), or emotion comprehension (p= .256) was found. Furthermore, there is little evidence that a significant relationship exists between a participant's trust in *The Times* and their willingness to help those affected by the refugee crisis (p= .848).

Participants were also asked if they consumed news from *The Times* regularly. A one-way ANOVA and Tukey HSD found no statistically significant relationship between a participant's frequent consumption of *The Times* and their perspective-taking (p= .622). Therefore, on both counts, trust in, and frequent consumption of *The Times* did not appear to have a strong modifying effect on the results of this experiment.

DISCUSSION

In my study, analysis on whether VR technology had significant media effects on news audiences as opposed to traditional forms of media was carried out to better understand the effects of VR journalism. In general, the results pointed to a few statistically relevant effects of the technology on news audiences, which ran counter to two key previous studies on VR journalism. This section of the thesis will discuss possible causes for these differences in findings and the implications of the results of this thesis on future research. Additionally, it will discuss relevant considerations for journalists and media practitioners interested in immersive storytelling with technologies like VR and AR.

Implications of the study findings

The results of this thesis revealed no significant statistical evidence that the condition of "The Displaced" (VR journalism or otherwise) had any relationship to participant's level of perspective-taking for those affected by the refugee crisis. Additionally, there was no evidence that the condition of the story had a significant relationship to participant's willingness to help those affected by the refugee crisis. These findings differ from earlier studies such as Schutte & Stilinovic (2017) which did find a significant relationship between VR journalism ("Clouds Over Sidra") and perspective-taking in its pilot test and Sundar, Kang & Oprean (2017) which found a significant relationship between VR journalism and some aspects of participants willingness to tell others about the refugee crisis (one of the helping behaviors surveyed in the study). One possible explanation for this difference in findings is that both of these key studies differed a bit in methodology from my experiment, which was discussed in greater detail previously in the "Key Studies" subsection of this thesis, on pages 35-37. The Sundar, Kang & Oprean (2017) study found a "significant main effect shows that participants in the VR and 360-degree video

conditions were more empathetic toward the story characters than their counterparts in the Text condition" and that "Similarly, participants in the VR and 360 -video conditions reported higher story-sharing intention than those in text." (Sundar, Kang & Oprean, 2017, p. 675). While testing for my thesis did not confirm a significant main effect, it was found that the overall condition groups had differences in mean scores for perspective-taking. That is to say that print participants indicated the least amount of perspective-taking and click-through VR participants, the highest. While the difference in means was quite small, it did show marginal evidence that perspective-taking was lower for the participants in the print condition, suggesting there may have been a slight effect on participant's empathy when viewing the VR conditions (HMD or click-through). As the results showed above, another important implication of my thesis was that a positive relationship between immersion and empathy (hypothesis one) was not confirmed to be significant. This too conflicted with both key studies from Schutte & Stilinovic (2017) and Sundar, Kang & Oprean (2017) possibly again due to differences in the sampling populations or in methods employed to measure immersion and empathy which differed slightly between each study.

As for the results on how levels of immersion are related to the condition of the story, these were slightly more nuanced than the results of the previous testing on the research question and hypothesis one. Analysis of these variables amounted to a confirmation that levels of immersion were related to the medium of the story because it's clear that the effect of VR journalism on immersion was significant. However, one somewhat unexpected finding of my thesis was that immersion didn't increase between the click-through and VR HMD conditions in a statistically significant way. Though it was true that participant's level of immersion reported after watching "The Displaced" did not vary strongly between those who received the HMD or

the click-through VR conditions, these two groups each reported significantly different mean levels of immersion from the print group. This is important because it suggests that levels of immersion were greater for any medium of VR journalism in my study but did not increase significantly depending on the medium in which the VR journalism piece was administered to them. Interestingly, this finding also conflicted with the Sundar, Kang & Oprean (2017) study that found that participants scored their feelings of 'being-there' to increase on a continuous scale among the text, then the 360-degree video, and finally the VR conditions. Though their study noted that "participants in the VR and 360-degree video conditions did not differ from each other significantly on interaction and realism, while both were higher than those in the text" (Sundar, Kang & Oprean, 2017, p. 674). Again, it is pertinent to note that immersion was measured differently in the two studies, and the SUS Questionnaire was chosen for my design because it was more frequently used in similar studies than the MAIN model. Additionally, some methodological differences were previously described in pages 35-37 that may explain conflicts in the findings of our two key studies.

Another widely important finding of this thesis and several other studies is the confirmation of a statistically significant positive relationship between perspective-taking and helping behaviors posited by hypothesis three. This finding that perspective-taking influences willingness to help confirms findings from several other studies including both the Sundar, Kang & Oprean (2017) and Schutte, Stilinovic (2017) studies, but also further literature reviewed for this thesis including Batson, Sager et al., (1997), Bekkers & Wilhelm (2006), Davis Schroeder & Graziano, (2015), and Miller (2013). This supports the idea that perspective-taking is a key reason that news audiences may engage helpfully towards the subjects of news stories, and

beyond the news, that perspective-taking can be a key motivating factor in people's willingness to engage in prosocial behaviors.

Finally, as outlined in hypothesis four, one of the other questions in this thesis was whether personality disposition, empathetic capacity, or political ideology had any moderating effects on helping behaviors in news audiences. Each of these questions were posed as possible ways of extending the work of the key studies of Schutte & Stilinovic (2017) and Sundar, Kang & Oprean (2017) as a way to examine other factors of participants' dispositional traits that might have contributed to their overall willingness to engage in helping behaviors. Because personality disposition, empathetic capacity, and political ideology were all confirmed to have significant effects on prosocial behavior, this adds needed context to the overall understanding of why some participants may behave helpfully towards populations being highlighted in news stories.

Taking a closer look at the specific implications of each of these findings for hypothesis four reveals some interesting context on how personality, empathetic capacity, and political ideology affect participants' willingness to behave prosocially. Analysis on participant's Five-Factor Model of Personality, which is scored for levels of extraversion, conscientiousness, neuroticism, agreeableness, and openness to experience/intellect determined that participants with high scores for agreeableness tended to rate themselves likelier to engage in helping behaviors on behalf of those affected by the refugee crisis. Specifically, the finding that more agreeable participants were most likely to report a willingness to help on the increasing helping behaviors scale falls in line with previous research from Caprara, Alessandri & Eisenberg (2012), Graziano, Habashi & Sheese (2007), and Olukayode (2013). Though it is worth noting that other personality dispositions in addition to agreeableness have also been linked to prosocial behavior including openness and conscientiousness according to both Luengo et al. (2014) and

Courbalay et al. (2015), the results of my thesis did not find these dispositions to be significantly related to helping behaviors in participants.

Another key finding of this thesis was that some aspects of a participant's existing capacity for empathy significantly moderated overall helping behaviors. Specifically, the process of empathetic capacity that was significantly related to helping behaviors was sympathetic physiological arousal as measured by the TEQ. As for how this finding relates to previous literature on the subject, it is again relevant to remember that sympathy is a "form of care or concern for another person" (Miller, 2013, p. 106) and that this care or concern has often been brought up alongside the idea of compassionate acts such as in research from Bekkers & Wilhelm (2006) and Spreng, McKinnon et al. (2009). Additionally, the finding that empathetic capacity had a significant relationship to helping behaviors was also in alignment with previous research from Davis, Schroder & Graziano (2015), and McIntyre & Sobel (2017). Each of these studies found that aspects of the empathy process were also related heavily to prosocial behaviors in their participants, strengthening the case that empathy must be considered not just as a form of reaction to others as in the case of perspective-taking, but also as a dispositional trait among participants.

Finally, the last major finding of this thesis was that there was a statistically significant relationship between a participant's political ideology as measured by the ideological consistency scale and helping behaviors. This finding fits well within a context of previous literature from Farwell & Weiner (2000) and Osbourne & Weiner (2015) that has also confirmed this linkage and indicates a strong relationship between a person's political beliefs and their willingness to behave helpfully in this study towards those affected by the refugee crisis, just as was suggested by the fourth hypothesis of this thesis. Similarly, results on political ideology and

willingness to help also confirmed findings from several other studies including from Manesi, Van Lange, Van Doseum & Pollet (2019), and Van Lange, Bekkers, Chirumbolo & Leone (2011) which all suggested that politically conservative participants were less likely to engage helpfully with 'less fortunate' others due to their worldview. Like with these other studies, my thesis suggests that the process of prosocial engagement has many moderators. The logical conclusion then, is that news audiences' behaviors and reactions to the news may have less to do with the journalism itself and more to do with the natural characteristics of participants who are already predisposed to help. These findings extend some of the work of the aforementioned previous studies which have examined these moderators on prosocial behavior in the fields of psychology and sociology.

The confirmed relationships between perspective-taking, personality disposition, empathetic capacity, and political ideology on helping behaviors help to demonstrate the complicated relationship between many different factors and prosocial behavior. This is a level of nuance sorely needed to talk about why people behave helpfully towards one another. As previous literature, and the results of this thesis demonstrate, the reasons that someone may choose to act helpfully towards someone else are many and varied. Significantly manipulating this behavior using technologies like VR as methods of storytelling does not always yield strong or predictable results. Can empathy play a helping hand? This study confirms a link between perspective-taking and prosocial behavior as well as a link between empathetic capacity and prosocial behavior, but it is important to note that personality and politics were also significant modifiers which can serve as a reminder for researchers and media practitioners alike that these processes have powerful relationships outside of media effects. Further, the findings of this study suggest that cultivating empathy using media itself may not be as straightforward as offering a

person a VR headset and a news story and expecting them to become empathetic towards the subjects within it.

Limitations

Given the context of gender and prosocial behavior as posited by researchers like Shah & Rivzi (2016), and Yoleri (2014), it is notable that the gender breakdown of about two females to one male participant in my study may have presented a potential moderating factor of the results. Also, importantly, researchers have noted a tendency for people's empathy and helping behaviors to change depending on whether or not they can identify with an in-group of the subject of their empathy (like with the Katie Banks case earlier in this thesis from the Batson, Sager et al. (1997) study). Therefore, the age representation of the sample population may have influenced the results of this thesis if participants saw the subjects of "The Displaced" as an out-group because they are young children or because they are from a different race or creed. The concept of in-group and out-group bias may also apply when talking about the ethnic backgrounds of participants sampled. Also, there is the distribution of political ideologies as measured by the Ideological Consistency Scale. To add further context to the possible effects of political ideology on empathy that were considered in this study, it's prudent to look at the standard curve of participant's scores on the ideological consistency scale to better understand the range of political ideologies represented within this sample (see figure 1, p. 53). Finally, another important limitation of this thesis was the use of a single message ("The Displaced") as stimulus material, making it impossible to control for the message's efficacy as compared to other stimulus messages.

Recommendations for future research

After completing this research, several possible areas for future study emerged as a result of some of the limitations of the current study as well as some unexpected findings of the data. These recommendations represent the areas of possible research that would help to add context to the current study, as well as explore new avenues related to the findings of this thesis.

Operational replication of this study with changes to the sampling scheme

One idea for future research would be to replicate the study with a different sampling scheme to ensure firstly that the sample size is increased, and secondly that the sample population includes more diverse participants in terms of ethnic identities, age, gender, spoken languages, political ideologies, and travel habits. One way of achieving this could include having participants qualify for their condition group in the pre-test survey stage and then running statistical analysis to determine the standard deviations of these descriptive traits to ensure a more normal distribution of these traits by condition group on a standard curve. This would change the approach from random assignment of a convenience sample of the participants to a sample distribution approach that would stratify the sample among each of these groups (ethnic identities, age, gender, spoken language, political ideology, and travel habits). Due to this amount of extra work to ensure a more diverse population, likely the sampling for this operational replication of the study would require a multi-stage sample, which might also present a limitation if staging took long enough to worry about a history effect on the participants. This approach would also require a much more precise recruiting effort to better recruit participants within each group.

AR technology, immersion, empathy and helping behaviors

As evidence mounts to support the idea that the journalism industry is shifting towards employing more augmented reality technology (Willens, 2019), an idea for future research might involve designing a very similar experiment to the one in this thesis, but with AR rather than VR journalism being the stimulus material selected. Already, some media outlets are deploying AR projects that might be tapped to find a stimulus material for further study (like "The Displaced" was in this thesis) and in the key study from Sundar, Kang & Oprean (2017). Although it is possible that similar effects may be confirmed with a study such as this, it is also possible that the distinction between these technologies constitutes an entirely different set of media effects on news audiences. One challenge of creating an experimental design like the one in this thesis for the purposes of AR to anticipate is that it might be difficult to find a story with a print as well as AR medium condition (like "The Displaced" was for VR and print). To accomplish such a study, the research question of this thesis could be repurposed to examine if AR journalism impacts empathy in news audiences, and by extension prosocial behaviors. Repurposing hypothesis one of this thesis (that there is a positive relationship between AR journalism and level of immersion) would also potentially lead to interesting results. To conduct this testing, it's worth noting that AR has a distinct difference from VR in that the virtual environment is superseded onto the real environment of the user. To that end, it's useful to take a step back to explain what AR is and how it works.

> Augmented reality is the blending of interactive digital elements – like dazzling visual overlays, buzzy haptic feedback, or other sensory projections – into our real-world environments. If you experienced the hubbub of Pokémon Go, you witnessed augmented reality in action. This (once incredibly popular) mobile game allowed users to view the world around them through their smartphone cameras while projecting game items, including onscreen icons, score, and ever-elusive Pokémon creatures, as overlays that made them seem as if those items were right in your real-life neighborhood. The game's design was so immersive that it sent millions of kids and adults alike walking (and

> absentmindedly stumbling) through their real-world backyards in search of virtual prizes. (Bonsor & Chandler, 2019, p. 1).

As the above passage illustrates with the example of Pokémon Go, AR essentially constitutes a mixed reality for users because it supersedes graphics or visual elements onto the real scene that someone is looking at, using for example the lens of a phone camera or a wearable device. Given the technological affordances of AR, this means that in a future study on AR, the physical environment where folks in the study are viewing the AR story would likely need to be controlled so that subjects are looking at the same visual feedback. If the environment in which users were to encounter an AR story cannot be controlled, it would be prudent to talk about the differences in mixed reality environments encountered by users, which would likely bring about many other interesting things in the literature review and results of a study such as this. That difference in technology might also mean that using the SUS presence questionnaire would be unhelpful, given that the study "Using presence questionnaires in reality" found that "though such questionnaires [SUS Presence and Witmer Singer Presence] may be useful when all subjects experience the same type of environment, their utility is doubtful for the comparison of experiences across environments, such as immersive virtual compared to real" (Usoh et al., 2000, p. 1).

High-order prosocial behaviors (TEQ) and helping behaviors

One of the surprising results of this study was that there was no relationship found between participants' high-order prosocial behaviors as self-reported on the TEQ, and participant's reported willingness to help on the adapted (Thompson, 2015) scale. On the TEQ, the item that pertains to high-order prosocial behaviors is as follows: "I get a strong urge to help when I see someone who is upset" (Appendix A, p. 105). This result prompts the question, did

participants view their willingness to help as an abstract concept when answering the item on the TEQ that pertains to high-order prosocial behavior rather than when a specific opportunity to behave prosocially presented itself like with the helping behaviors scale? Further, might this have changed if they were asked to identify with a different empathetic target? Additional testing could be conducted to find out if the helping behaviors towards those affected by the refugee crisis might have been different if the population in need of help was also different. Finally, this study could look into if there are true follow-throughs in the form of actions, rather than stated intentions to behave prosocially towards an empathetic target by designing a real-action opportunity to get involved. In other words, a study to examine the effective differences between high-order prosocial behaviors as examined by the TEQ and helping behaviors as examined by a sliding scale measure such as the one in this thesis could help to further illuminate what the implications of this finding might be on how high-order prosocial behavior operates as a facet of empathetic capacity.

Individuals vs. groups as empathetic target

As noted previously in the section of this paper "The ethos of individual stand-ins for systematic problems in journalism" on page 11 of the literature review, it is not altogether uncommon for journalists to make a practice of using individual anecdotes to explain or demonstrate larger societal problems using the subjects in their story. Due to this, in the design of my experiment, I adjusted the language of some measures to reflect this journalistic tradition of using individual subjects as stand-ins for larger societal problems. The empathetic target of my study was a group, termed "those affected by the refugee crisis." This wording was used in the perspective-taking scale and the helping behaviors scale post-test measures as opposed to using the names of the individual subjects: Oleg, Chuol, and Hana from "The Displaced." An

example item from the perspective-taking scale with this terminology is as follows: “I sometimes find it difficult to see things from the point of view of those affected by the refugee crisis” (Appendix B, p. 109). This is an important distinction because some researchers like Miller (2013) have previously suggested that empathy for individuals differs from empathy for groups, as does intention to behave prosocially. For this reason, a suggestion for future research would involve testing participants reaction to the individual subjects from the story as an additional condition group by adjusting the language on the perspective-taking and helping behaviors scale to include the names Oleg, Chuol, and Hana but otherwise to perform an operational replication of the current study to assess whether or not significant differences exist between self-reported perspective-taking for “those affected by the refugee crisis” as opposed to “Oleg, Chuol, and Hana” themselves.

VR journalism, helping behaviors and empathy among conservatives

As was mentioned in the limitations section of this thesis, the vast majority of my participants fell into a skewed representation of political ideology comprised most often of the “mostly liberal” category. However, the results of a future study similar to the one in this thesis would also be interesting if the sample of participants had not skewed to the left in terms of political ideology. To that end, I would suggest a purposive sampling of conservative participants as another operational replication of this study. Measuring participant’s response to each of the conditions of the stimulus material, “The Displaced,” to see if for mostly conservative or consistently conservative participants likeliness to report that they would engage in helping behaviors differed significantly. This is especially intriguing considering that the subjects of the documentary are refugees, which in recent years has become a particularly politically charged topic. To that end, a potential area for future research would be more focused

on the effects of political ideology among conservatives on helping behaviors, and perhaps also perspective-taking in news audiences.

Immersion beyond modality as a motivator for prosocial behavior

One of the underlying theories used to contribute to the design of this thesis study is system immersion, or the idea that the affordances of certain types of technology like VR can contribute to greater feelings of immersion. Because of this framework, modality or medium of the stimulus material was examined as related to immersion and indeed was sometimes used interchangeably in the operational testing of hypotheses meant to examine the effects of medium on news audiences. However, an opportunity for future research to step outside of the confines of this paradigm and instead to inspect immersion as an independent variable, unrelated to medium or modality of the message could prove interesting, especially given the results of this thesis as they pertained to levels of immersion between the click-through VR and HMD VR condition groups, which did not increase positively in a linear relationship the way I expected it to during the hypothesis writing phase of my design. In a future study, if the researcher(s) were to design a study which could take into account the effects of immersion itself on news audiences, it might provide an interesting opportunity to further understand what factors underpin a participant's sense of immersion, beyond the systems in which they view a message. For example, an analysis of other moderating factors of immersion could provide more context into why some readers reported feeling more immersed in the print version of "The Displaced" than others. Therefore, an additional suggestion for future research would be to divorce the concepts of immersion and medium altogether in the operational structure of the hypotheses and see if analysis uncovers any interesting insights from there.

Engaging news audiences with sympathy, rather than empathy

The process of empathetic capacity that had a positive relationship to helping behaviors as self-reported in this study was that of sympathetic physiological arousal, leading to the idea that further study on sympathy as a catalyst for helping behaviors is needed to help contextualize this result. One of the underlying assumptions of the industry as noted earlier in the literature review of this thesis was a journalistic dogma of empathy or the idea that empathy is important to the journalistic process, for both journalists and news audiences. Researchers interested in media effects could look at extending both of these potential areas of research to compare the differences between empathetic and sympathetic arousal would also make for an interesting layer of further context for these results. In any case, because this thesis chose to focus heavily on empathy, more focus on the difference between the process of sympathetic physiological arousal as tested in the TEQ, and sympathy proper would be an interesting area to explore with research and a possible opportunity for a further concept explication like the one on empathy in this thesis.

Shifting industry priorities from VR to AR

Now that the technology for VR journalism has been on the market for several years, there is some evidence that journalists and media practitioners are cooling on the idea that VR production should be a priority for the industry. This assessment is in part because HMD systems are still not widely adopted, and in part due to realizations of the great number of resources that had in the past been dedicated to VR without a clear end-goal in mind for journalists. The problem it seems is not just in the media industry.

> The reality is that VR remains a niche technology that no longer interests marketers and is getting less push from platforms such as Google and Facebook. Due to these issues, the exuberance that drove so much of the enthusiasm for VR has been replaced by pragmatism today, leaving publishers much more clear-eyed about how much attention

> VR should get. And much of what publishers learned — and a lot of the talent they amassed — with VR has been carried over into their augmented reality efforts. (Willens, 2019, para. 5).

Contributing to the feeling that VR is a 'niche technology' there is also the problem of low adoption rates. "Today, thanks to low consumer adoption, VR has receded to the fringes, as augmented reality and "voice" have become buzzwords of choice for media futurists, and some of the work that publishers put toward VR has been scaled back" (Willens, 2019, para. 4). These sentiments get further complicated by the notion that sometimes media practitioners attempt to pick up VR technology as a way to appear more innovative after watching other companies do it. After an interview with a subject for a 2018 report for the Reuters Institute, this feeling that VR technology was encouraging a bandwagon effect was mentioned:

> Daniel Sieberg observed a disconnect between how much news organizations felt that they should act like they are leading on innovation and how much they were actually chasing innovation. 'There's always this pressure to "keep up with the Jones's",' he said. 'Like "so and so is doing VR, how about it?" (Posetti, 2018, p. 16).

But in keeping up with the Jones's by producing more VR technology, Posetti argues that perhaps VR is another 'shiny thing' getting in the way of a 'sustainable model of journalism innovation.' "Obsessive pursuit of technology in the absence of clear and research-informed strategies – is the diagnosis offered by participants in this research. The cure suggested involves a conscious shift by news publishers from being technology-led, to audience-focused and technology- empowered" (Posetti, 2018, p. 1). Given that the tide is turning in the industry away from VR as the darling new technology and into the direction of augmented reality (AR), this thesis might be considered one additional reason to advise journalists to approach emerging technologies with caution, before putting a full vote of confidence and many resources into new technologies that could be a lifeboat for an industry that is struggling. And of course, this research is also a logical jumping-off point for future investigations of a similar nature.

Applications for the journalism industry

The thinking behind this research design was as follows: if future journalists can use VR stories to engender greater empathy in consumers of the news, it could be a great force for social change. On the other hand, if not, it could be a pivotal moment for the industry to learn to approach emerging technologies like VR with more skepticism. Given the results of this experiment, it stands to reason that one of the central points of this thesis is to complicate the notion of VR as an empathy machine in the journalism industry. To approach these matters with a healthy dose of nuance may help journalists avoid the mistake of dedicating significant resources towards producing and distributing VR journalism under the false promise of more empathy and prosocial behaviors on the part of news audiences especially at a time when much of the industry is financially struggling. And at least as it appears at the moment, perhaps many journalists are starting to catch on to the idea that VR may not be the next big thing to save journalism (see "shifting industry priorities," p. 84).

Cost-benefit analysis of VR journalism production in a struggling industry

It's no secret that the media industry is in a state of financial struggle in recent years, especially as local news outlets have struggled to adapt to a changing digital media landscape. In the article "Fast facts about the newspaper industry's financial struggles as McClatchy files for bankruptcy," it is noted that between 2008 and 2018, newspaper revenues declined sharply and newsroom employment has dropped by 47% even at a time when "Americans have little awareness of the financial challenges facing local newsrooms" (Grieco, 2020, para. 6). Now, this struggle has become even more critical as the result of the coronavirus pandemic (James, 2020). Given these financial realities, it is clear that news outlets have no extra money to waste on new technologies that do not ultimately bring meaningful outcomes to their business. To that end, I

think it would be particularly illuminating to see a thorough cost-benefit analysis case study on the cost of VR journalism production as opposed to the revenue opportunities for journalists. Given the evidence of a shift in the industry away from this technology anyway, it might be an interesting opportunity for some qualitative research with in-depth interviews from media practitioners that are no longer focusing on VR despite doing so in the past. This investigation could also focus on any other results of deploying this technology that may be beneficial to news outlets, and especially local news outlets. As pointed out previously by Posetti (2018), there are not always concrete goals for emerging technologies and what they mean for journalism innovation. The point of a case study such as this would be to ask the research question: Should VR journalism be a top priority for news outlets based on costs vs. benefits to the outlet?

VR journalism adoption among older participants

Next, a discussion is warranted on some of the adoption limitations of the technology used for VR. One potential further area of study would be how older news audiences may respond to and adopt VR journalism. This research could investigate the assumption that older users might struggle to understand the user interface of VR journalism stories and struggle with HMD hardware. With this possibility in mind, it would be worth it to further examine the hypothesis that news audiences of an older demographic than the one represented in this study (whose mean age was 20.71), might struggle with navigating VR technology for news stories. This might also be of particular interest as another facet of a cost-benefit analysis of the technology if it was used by media outlets comparatively with demographic data on their typical audiences via analytics tools like Google Analytics, Chartbeat, Parse.ly or the like.

Does immersion constitute an end goal for news audiences?

Finally, another area of potential interest that I would recommend to be pursued is what exactly the goal post should be for news audiences when it comes to their levels of immersion in the story. As has been pointed out by scholars such as Jones (2017), Shin & Biocca (2018), Sirkkunen et al. (2016), Sundar, Kang & Oprean (2017) there is indeed a concerted interest in immersive journalism, however, it's worth a case study on what the media effects of such immersion are and whether they are an appropriate end-goal for journalists and media outlets. This type of investigation would be very similar to the aforementioned recommendation on a cost-benefit analysis of VR journalism in that it would require a clear-eyed use of analytics metrics in measuring why the goal should or should not be to get news audiences to become immersed in the news stories told in the industry.

Conclusion

An examination of the findings and implications of this experiment revealed that the media effects of VR journalism are not always as straightforward as they may have appeared to pioneering media practitioners in the early rush for VR journalism. Instead, the findings of this study showed no significant relationship between VR journalism, greater empathy, and by extension greater helping behaviors, nor a relationship between levels of immersion and empathy, both of which did not replicate the studies which guided this experiment including Schutte & Stilinovic (2017) and Sundar, Kang & Oprean (2017). Perhaps this was caused by a difference in sampling and measurement approach to the key concepts and variables at play or further effects from the novelty of VR technology, which at the time drew greater excitement in the field according to Willens (2019). But in any case, the differences in design stemmed from a desire for more rigorous measures of immersion with the SUS Presence questionnaire, and more

broad definitions of the empathetic target of the story, as with changing the perspective-taking language to ask participants about 'those affected by the refugee crisis' which was meant to align with the journalistic tradition of individuals as stand-ins for greater societal problems (in this case, with "The Displaced" subjects Oleg, Chuol and Hana standing in as representatives of the refugee crisis). However, additional results from this thesis did align with each of these key studies. That included the results of an analysis on levels of immersion and VR journalism, which was partially confirmed to align with each of these studies in that the print condition participants had a much lower sense of immersion than either group administered a VR condition (HMD or click-through), and findings that empathy had a significant relationship to prosocial behavior was fully confirmed to align with the findings of each 2017 study. Moreover, significant results on the moderating effects of perspective-taking, personality disposition, empathetic capacity, and political ideology on prosocial behavior confirmed extensive previous research from Bekkers & Wilhelm (2006), Farwell & Weiner (2000), Graziano, Habashi & Sheese (2007), Miller (2013), Osbourne & Weiner (2015), Shah & Rizvi (2016), and Spreng, McKinnon et al. (2009). Additionally, the findings of this experiment led to many ideas for future research and applications in the field of journalism as well as an assessment of the current state of VR technology in the news industry.

Overall, the most important implication of this study may be that manipulating news audiences to behave more prosocially due to the technology, structure or framing of a news story is not a simple thing to accomplish, and in general, the media effects at play within this framework represent just one facet of the possible explanations as to why someone might like to get involved. This is important for academics because it shows that there is plenty of room in fields both inside and outside of communication to examine the role that different characteristics

play in an individual's reaction to the news. There are many areas of research that might find this relevant to know including the fields of psychology and sociology, considering that news consumption is a part of everyday life for almost everyone and that conversations about ‘the media’ and ‘agenda in the news’ come up broadly in a variety of disciplines. Understanding that media effects are not necessarily a strong predictor for behavior in the case of VR journalism could lead to a wealth of further areas to study and applications in the field.

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APPENDIX A:

Pre-test Measures

Part I: Tell me about yourself.

1. What is your gender identity?
    a) Male
    b) Female
    c) Other (please list): _____

2. What is your age: _____ years

3. What is your current year at CSU?
    a) First year
    b) Second year
    c) Third year
    d) Fourth year
    e) Fifth year
    f) Other (please list): _____

4. What is your ethnicity?
    a) American Indian or Alaska Native
    b) Asian
    c) Black or African American
    d) Native Hawaiian or Other Pacific Islander
    e) White
    f) Other (please list): _____

5. Are you of Hispanic, Latino or Spanish origin?
    a) Yes
    b) No

6. What language(s) do you speak? And what proficiency level would you consider yourself (Beginner, Intermediate, Advanced, Primary Language) --Add a dropdown system for language filled in and a drop-down menu for each free response

_____
_____
_____
_____

Part II: How would you describe yourself?

For the following statements, rate your level of agreement on how accurately this represents you. Circle your answer on the response form. There are no right or wrong answers or trick questions. Please answer each question as honestly as you can.

1. I am the life of the party.

Very inaccurate			Neither inaccurate nor accurate			Very accurate

2. I sympathize with others' feelings.

Very inaccurate			Neither inaccurate nor accurate			Very accurate

3. I get chores done right away.

Very inaccurate			Neither inaccurate nor accurate			Very accurate

4. I have frequent mood swings.

Very inaccurate			Neither inaccurate nor accurate			Very accurate

5. I have a vivid imagination.

Very inaccurate			Neither inaccurate nor accurate			Very accurate

6. I don't talk a lot.

Very inaccurate			Neither inaccurate nor accurate			Very accurate

7. I am not interested in other people's problems.

Very inaccurate			Neither inaccurate nor accurate			Very accurate

8. I often forget to put things back in their proper place.

Very inaccurate			Neither inaccurate nor accurate			Very accurate

9. I am relaxed most of the time.

Very inaccurate			Neither inaccurate nor accurate			Very accurate

10. I am not interested in abstract ideas.

Very inaccurate			Neither inaccurate nor accurate			Very accurate

11. I talk to a lot of different people at parties.

Very			Neither			Very

inaccurate			inaccurate nor accurate			accurate

12. I feel others' emotions.

Very inaccurate			Neither inaccurate nor accurate			Very accurate

13. I like order.

Very inaccurate			Neither inaccurate nor accurate			Very accurate

14. I get upset easily.

Very inaccurate			Neither inaccurate nor accurate			Very accurate

15. I have difficulty understanding abstract ideas.

Very inaccurate			Neither inaccurate nor accurate			Very accurate

16. I keep in the background.

Very inaccurate			Neither inaccurate nor accurate			Very accurate

17. I am not really interested in others.

Very inaccurate			Neither inaccurate nor accurate			Very accurate

18. I make a mess of things.

Very inaccurate			Neither inaccurate nor accurate			Very accurate

19. I seldom feel blue.

Very inaccurate			Neither inaccurate nor accurate			Very accurate

20. I do not have a good imagination.

Very inaccurate			Neither inaccurate nor accurate			Very accurate

Below is a list of statements. Please read each statement carefully and rate how frequently you feel or act in the manner described. Circle your answer on the response form. There are no right or wrong answers or trick questions. Please answer each question as honestly as you can.

		Never	Rarely	Sometimes	Often	Always

1.	When someone else is feeling excited, I tend to get excited too	0	1	2	3	4
2.	Other people's misfortunes do not disturb me a great deal	0	1	2	3	4
3.	It upsets me to see someone being treated disrespectfully	0	1	2	3	4
4.	I remain unaffected when someone close to me is happy	0	1	2	3	4
5.	I enjoy making other people feel better	0	1	2	3	4
6.	I have tender, concerned feelings for people less fortunate than me	0	1	2	3	4
7.	When a friend starts to talk about his\her problems, I try to steer the conversation towards something else	0	1	2	3	4
8.	I can tell when others are sad even when they do not say anything	0	1	2	3	4
9.	I find that I am "in tune" with other people's moods	0	1	2	3	4
10.	I do not feel sympathy for people who cause their own serious illnesses	0	1	2	3	4
11.	I become irritated when someone cries	0	1	2	3	4

12.	I am not really interested in how other people feel	0	1	2	3	4
13.	I get a strong urge to help when I see someone who is upset	0	1	2	3	4
14.	When I see someone being treated unfairly, I do not feel very much pity for them	0	1	2	3	4
15.	I find it silly for people to cry out of happiness	0	1	2	3	4
16.	When I see someone being taken advantage of, I feel kind of protective towards him\her	0	1	2	3	4

Part III: Tell me a little more about your political beliefs:

Below you will be given a set of two statements related to a variety of political positions. Please circle the statement with which you most agree on the response form. There are no right or wrong answers or trick questions. Please answer each question as honestly as you can.

Government often does a better job than people give it credit for.	Government is almost always wasteful and inefficient.

Government regulation of business is necessary to protect the public interest.	Government regulation of business usually does more harm than good.

Poor people today have it easy because they can get government benefits without doing anything in return.	Poor people have hard lives because government benefits don't go far enough to help them live decently.

The government should do more to help needy Americans, even if it means going deeper into debt.	The government today can't afford to do much more to help the needy.

Racial discrimination is the main reason why many black people can't get ahead these days.	Blacks who can't get ahead in this country are mostly responsible for their own condition.

Immigrants today are a burden on our country because they take our jobs, housing and health care.	Immigrants today strengthen our country because of their hard work and talents.

Good diplomacy is the best way to ensure peace.	The best way to ensure peace is through military strength.

Stricter environmental laws and regulations are worth the cost.	Stricter environmental laws and regulations cost too many jobs and hurt the economy.

APPENDIX B:

Post-test Measures

Part I: Tell me about how the virtual environment made you feel.
Please characterize your experience in the environment, by marking an "X" in the appropriate box of the 7-point scale, in accordance with the question content and descriptive labels. Please consider the entire scale when making your responses, as the intermediate levels may apply. Answer the questions independently in the order that they appear. Do not skip questions or return to a previous question to change your answer.

1. Please rate your sense of being in the virtual environment, on a scale of 1 to 7, where 7 represents your normal experience of being there with the refugees.

   |_____|_____|_____|_____|_____|_____|_____|

   NOT AT ALL COMPLETELY

2. To what extent were there times during the experience when the virtual environment was the reality for you?

   |_____|_____|_____|_____|_____|_____|_____|
   AT NO TIME ALMOST ALL THE TIME

3. When you think back to the experience, do you think of the virtual environment more as images that you saw or more as somewhere that you visited?

   |_____|_____|_____|_____|_____|_____|_____|
   IMAGES THAT I SAW SOMEWHERE THAT I VISITED

4. During the time of the experience, which was the strongest on the whole, your sense of being in the virtual environment or of being elsewhere?

   |_____|_____|_____|_____|_____|_____|_____|
   BEING ELSEWHERE BEING WITH THE REFUGEES

5. Consider your memory of being in the virtual environment. How similar in terms of the structure of the memory is this to the structure of the memory of other places you have been today? (By ‘structure of the memory’ consider things like the extent to which you have a visual memory of the virtual environment, whether that memory is in colour, the extent to which the memory seems vivid or realistic, its size, location in your

imagination, the extent to which it is panoramic in your imagination, and other such structural elements)

|_____|_____|_____|_____|_____|_____|_____|
NOT AT ALL VERY MUCH SO

6. During the time of your experience, did you often think to yourself that you were actually in the virtual environment?

|_____|_____|_____|_____|_____|_____|_____|
AT NO TIME ALMOST ALL THE TIME

Part II: Rate your desire to help those affected by the refugee crisis.
For the following statements, please circle your answer on the response form. There are no right or wrong answers or trick questions. Please answer each question as honestly as you can.

1. Rate your likeliness to tell a friend or neighbor about those who have been affected by the refugee crisis in areas like Syria, Ukraine, or Sudan?
    a) Very unlikely
    b) Somewhat unlikely
    c) Neither likely nor unlikely
    d) Somewhat likely
    e) Very likely

2. Rate your likeliness to volunteer for an organization doing pro bono work to help those affected by the refugee crisis?
    a) Very unlikely
    b) Somewhat unlikely
    c) Neither likely nor unlikely
    d) Somewhat likely
    e) Very likely

3. The CSU group Rams for Refugees has partnered with CSU for donations for those affected by the refugee crisis in Colorado. Donations will be used to provide housing accommodations, legal representation and career counseling to refugees resettling in Colorado. Please indicate whether you would like to help their efforts with a one-time donation. You have been told that any amount helps.

4. Would you give $20 to Rams for Refugees?
    a) Very unlikely
    b) Somewhat unlikely

c) Neither likely nor unlikely
d) Somewhat likely
e) Very likely

5. Assuming it fit into your schedule, rate how likely you would be to show up to the next Rams for Refugees meeting to discuss initiatives to help those affected by the refugee crisis?

a) Very unlikely
b) Somewhat unlikely
c) Neither unlikely or likely
d) Somewhat likely
e) Very likely

6. The Fort Collins City Council is having an upcoming meeting to discuss those affected by the refugee crisis in Northern Colorado. Rate how likely you would be to attend and participate in the conversation as a Fort Collins resident.

a) Very unlikely
b) Somewhat unlikely
c) Not likely or unlikely
d) Somewhat likely
e) Very likely

7. A local rally has been organized to stand in solidarity with those affected by the refugee crisis. Rate your how likely you would be to attend as a supporter.

a) Very unlikely
b) Somewhat unlikely
c) Not likely or unlikely
d) Somewhat likely
e) Very likely

Part III: Rate your ability to relate with those affected by the refugee crisis.

For the following statements, rate your level of agreement on how accurately this represents you. Circle your answer on the response form. There are no right or wrong answers or trick questions. Please answer each question as honestly as you can.

1. I sometimes find it difficult to see things from the point of view of those affected by the refugee crisis.

Does not describe me well				Describes me very well

2. I sometimes try to understand those affected by the refugee crisis better by imagining how things look from their perspective.

Does not describe me well				Describes me very well

3. I believe there are two sides to the refugee crisis and try to look at them both.

Does not describe me well				Describes me very well

4. If I'm sure I'm right about issues related to refugees, I don't waste much time listening to other people's arguments.

Does not describe me well				Describes me very well

5. I try to "put myself in their shoes" when it comes to those affected by the refugee crisis, even if I do not personally agree with related political forces.

Does not describe me well				Describes me very well

6. Before criticizing somebody affected by the refugee crisis, I try to imagine how it would feel if I were in their place.

Does not describe me well				Describes me very well

Part IV: Tell me more about your journalism consumption.

1. Which of the following sources do you regularly get news from about international news? (Select all)

1. Brietbart
2. Fox News
3. Drudge Report
4. The Sean Hannity Show
5. The Economist
6. The Wall Street Journal
7. The Blaze
8. Google News
9. BBC
10. USA Today
11. ABC News
12. The Rush Limbaugh Show

13. CNN
14. PBS
15. CBS News
16. NBC News
17. The Guardian
18. Yahoo News
19. NPR
20. Bloomberg
21. The Washington Post
22. MSNBC
23. The New York Times
24. The New Yorker
25. Politico
26. The Huffington Post
27. Slate
28. The Daily Show
29. BuzzFeed
30. Mother Jones
31. Daily Kos
32. The Ed Schultz Show
33. ThinkProgress
34. Vox
35. VICE
36. The Intercept

2. How often, if ever, do each of the following sources get the facts right when it comes to international news?

1. Brietbart

Almost all of the time	More than half of the time	About half of the time	Less than half of the time	Hardly ever	I don't know enough about this source to rate

2. Fox News

Almost all of the time	More than half of the time	About half of the time	Less than half of the time	Hardly ever	I don't know enough about this source to rate

3. Drudge Report

Almost all of the time	More than half of the time	About half of the time	Less than half of the time	Hardly ever	I don't know enough about this source to rate

4. The Sean Hannity Show

Almost all of the time	More than half of the	About half of the time	Less than half of the time	Hardly ever	I don't know enough about

	time				this source to rate

5. The Economist

Almost all of the time	More than half of the time	About half of the time	Less than half of the time	Hardly ever	I don't know enough about this source to rate

6. The Wall Street Journal

Almost all of the time	More than half of the time	About half of the time	Less than half of the time	Hardly ever	I don't know enough about this source to rate

7. The Blaze

Almost all of the time	More than half of the time	About half of the time	Less than half of the time	Hardly ever	I don't know enough about this source to rate

8. Google News

Almost all of the time	More than half of the time	About half of the time	Less than half of the time	Hardly ever	I don't know enough about this source to rate

9. BBC

Almost all of the time	More than half of the time	About half of the time	Less than half of the time	Hardly ever	I don't know enough about this source to rate

10. USA Today

Almost all of the time	More than half of the time	About half of the time	Less than half of the time	Hardly ever	I don't know enough about this source to rate

11. ABC News

Almost all of the time	More than half of the time	About half of the time	Less than half of the time	Hardly ever	I don't know enough about this source to rate

12. The Rush Limbaugh Show

Almost all of the time	More than half of the time	About half of the time	Less than half of the time	Hardly ever	I don't know enough about this source to rate

13. CNN

Almost all of the time	More than half of the time	About half of the time	Less than half of the time	Hardly ever	I don't know enough about this source to rate

14. PBS

Almost all of the time	More than half of the time	About half of the time	Less than half of the time	Hardly ever	I don't know enough about this source to rate

15. CBS News

Almost all of the time	More than half of the time	About half of the time	Less than half of the time	Hardly ever	I don't know enough about this source to rate

16. NBC News

Almost all of the time	More than half of the time	About half of the time	Less than half of the time	Hardly ever	I don't know enough about this source to rate

17. The Guardian

Almost all of the time	More than half of the time	About half of the time	Less than half of the time	Hardly ever	I don't know enough about this source to rate

18. Yahoo News

Almost all of the time	More than half of the time	About half of the time	Less than half of the time	Hardly ever	I don't know enough about this source to rate

19. NPR

Almost all of the time	More than half of the time	About half of the time	Less than half of the time	Hardly ever	I don't know enough about this source to rate

20. Bloomberg

Almost all of the time	More than half of the time	About half of the time	Less than half of the time	Hardly ever	I don't know enough about this source to rate

21. The Washington Post

Almost all of	More than	About half of	Less than half	Hardly ever	I don't know

the time	half of the time	the time	of the time		enough about this source to rate

22. MSNBC

Almost all of the time	More than half of the time	About half of the time	Less than half of the time	Hardly ever	I don't know enough about this source to rate

23. The New York Times

Almost all of the time	More than half of the time	About half of the time	Less than half of the time	Hardly ever	I don't know enough about this source to rate

24. The New Yorker

Almost all of the time	More than half of the time	About half of the time	Less than half of the time	Hardly ever	I don't know enough about this source to rate

25. Politico

Almost all of the time	More than half of the time	About half of the time	Less than half of the time	Hardly ever	I don't know enough about this source to rate

26. The Huffington Post

Almost all of the time	More than half of the time	About half of the time	Less than half of the time	Hardly ever	I don't know enough about this source to rate

27. Slate

Almost all of the time	More than half of the time	About half of the time	Less than half of the time	Hardly ever	I don't know enough about this source to rate

28. The Daily Show

Almost all of the time	More than half of the time	About half of the time	Less than half of the time	Hardly ever	I don't know enough about this source to rate

29. BuzzFeed

Almost all of the time	More than half of the time	About half of the time	Less than half of the time	Hardly ever	I don't know enough about this source to rate

30. Mother Jones

Almost all of the time	More than half of the time	About half of the time	Less than half of the time	Hardly ever	I don't know enough about this source to rate

31. Daily Kos

Almost all of the time	More than half of the time	About half of the time	Less than half of the time	Hardly ever	I don't know enough about this source to rate

32. The Ed Schultz Show

Almost all of the time	More than half of the	About half of the time	Less than half of the time	Hardly ever	I don't know enough about

	time				this source to rate

33. ThinkProgress

Almost all of the time	More than half of the time	About half of the time	Less than half of the time	Hardly ever	I don't know enough about this source to rate

34. Vox

Almost all of the time	More than half of the time	About half of the time	Less than half of the time	Hardly ever	I don't know enough about this source to rate

35. VICE

Almost all of the time	More than half of the time	About half of the time	Less than half of the time	Hardly ever	I don't know enough about this source to rate

36. The Intercept

Almost all of the time	More than half of the time	About half of the time	Less than half of the time	Hardly ever	I don't know enough about this source to rate

Part V: Tell me about your travelling habits

1. Have you ever travelled to Sudan, Ukraine, or Syria?
   a) Yes
   b) No

APPENDIX C:

Pilot Measures

Part I: Tell me about yourself.

1. What is your gender identity?
    a) Male
    b) Female
    c) Other (please list): _____

2. What is your age: _____ years

3. What is your current year at CSU?
    a) First year
    b) Second year
    c) Third year
    d) Fourth year
    e) Fifth year
    f) Other (please list): _____

4. What is your ethnicity?
    a) American Indian or Alaska Native
    b) Asian
    c) Black or African American
    d) Native Hawaiian or Other Pacific Islander
    e) White
    f) Other (please list): _____

5. Are you of Hispanic, Latino or Spanish origin?
    a) Yes
    b) No

6. What language(s) do you speak?

_____
_____
_____
_____

Part II: Tell me about your knowledge of virtual reality (VR) technology.

Q1 Have you heard of virtual reality (VR) before?

o Yes

o No

Q3 In your own words, what is virtual reality (VR)? (If you are unsure it is okay to write "I don't know")

_____
_____
_____
_____
_____

Q2 Mark the following virtual reality (VR) head-mounted displays you have heard of? (If you haven't heard of any of these you may select none and you may select multiple of these if you have heard of several)

▢ Oculus Rift

▢ HTC Vive

▢ Samsung Gear VR

▢ Google Cardboard

▢ None of these

▢ Other (please list): _____

Q4 What applications do you think are good for virtual reality? (You may select multiple)

▢ Gaming/Entertainment (to play games or watch entertainment media)

▢ Educational (to teach concepts to students)

▢ Journalism (for 360degree videos)

▢ Other (please list): _____

▢ Training (to teach an industry skill such as surgery for aspiring surgeons)

▢ I'm not sure

▢ I do not think virtual reality should be used.

Q5 Have you ever used VR before?

o Yes

o No

Q6 Since you answered yes to using VR technology, would you mind telling me what you used it for? (You may select multiple applications)

▢ Gaming

▢ 360 degree video (journalism)

▢ Training

▢ Educational

▢ 360 degree video (entertainment)

▢ Other (please list): _____

Q7 Since you answered that you had used VR technology, can you recall for me what head-mounted display you used? (You may select multiple)

▢ Oculus Rift

▢ HTC Vive

▢ Samsung Gear VR

▢ Google Cardboard

▢ I did not use a head-mounted display, I viewed a 360 degree video using an internet browser, such as Chrome.

▢ Other (please list): _____

Part III: Now, tell me what you know about virtual reality (VR) and journalism.

Q8 Did you know that VR could be used for journalism prior to this survey?

o Yes

o No

Q10 Have you heard of the following VR media projects? (Select any you have heard of. If you haven't heard of any of these you may select none)

▢ "6x9 Solitary Confinement" | The Guardian

▢ "Ivory Burn" | The New York Times

▢ "The Wall" | USA Today

▢ "The Displaced" | The New York Times

▢ "A Virtual Reality Guide to Virtual Reality" | The Wall Street Journal

▢ "Pencils of Promise" | Huffington Post RYOT

▢ "Hajj 360" | Al Jazeera

▢ "Seeking Home" | Huffington Post RYOT

▢ "The Fight for Falluja" | The Guardian

▢ None of these

▢ Other (please list all you can think of):

_____

Q9 Have you ever watched a piece of VR journalism before?

o Yes

o No

Skip To: Q11 If Have you ever watched a piece of VR journalism before? = No

Q11 Have you ever watched any of the aforementioned projects? (Please select multiple if you have viewed multiple)

▢ "6x9 Solitary Confinement" | The Guardian

▢ "Ivory Burn" | The New York Times

▢ "The Wall" | USA Today

▢ "The Displaced" | The New York Times

▢ "A Virtual Reality Guide to Virtual Reality" | The Wall Street Journal

▢ "Pencils of Promise" | Huffington Post RYOT

▢ "Hajj 360" | Al Jazeera

▢ "Seeking Home" | Huffington Post RYOT

▢ "The Fight for Falluja" | The Guardian

▢ None of these

▢ Other (please list all you can think of):

_____

Q12 Have you heard of The New York Times Daily 360?

o Yes

o No

Part IV: Tell me about your likelihood of adopting VR technology.

Q13 Do you currently own a VR head-mounted display? (Oculus Rift, HTC Vive, Samsung Gear VR, Google Cardboard or equivalent)

o Yes

o No

Q14 Please rank the following considerations in deciding to purchase a VR head-mounted display in order from most important to least important to you. (If you have already purchased a head-mounted display, please rank your considerations at the time)

_____ Cost
_____ Ease of use
_____ If I would use it a lot
_____ If it could help me with my job
_____ If I could learn with it
_____ If I could watch journalistic pieces with it
_____ If I could use it for gaming and entertainment
_____ If my friends had it
_____ If it made my life easier
_____ Other (please list):

Q17 How likely are you to purchase a VR head-mounted display?

o Extremely likely

o Moderately likely

o Slightly likely

o Neither likely nor unlikely

o Slightly unlikely

o Moderately unlikely

o Extremely unlikely

o I have already purchased a VR head-mounted display.

Q24 How likely are you to view a 360-degree journalism video in VR using a browser such as Chrome or Safari?

o Extremely likely

o Moderately likely

o Slightly likely

o Neither likely nor unlikely

o Slightly unlikely

o Moderately unlikely

o Extremely unlikely

o I have already viewed 360-degree journalism video using a browser.

Q20 Which (if any) VR head-mounted display do you currently own? (You may select multiple if you own several)

▢ Oculus Rift

▢ HTC Vive

▢ Samsung Gear VR

▢ Google Cardboard

▢ Other (please list): _____

▢ I do not own any VR head-mounted display.

Q18 What (if anything) excites you about VR?

_____

_____

_____

Q19 What (if anything) makes you cautious of VR?

_____

Q21 If you currently own a head-mounted display for VR, what made you decide to purchase the technology? (If you do not own a head-mounted display, please write, "N/A")

_____

Q23 Is there anything else you want to tell me about VR?

_____