# Simulación Virtual, Barreras Lingüísticas, y Violencia Doméstica: An Interdisciplinary Exploration of the Efficacy of XR in the Context of Language Barriers and Domestic Violence

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**&&**

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**&&**

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**Social Justice Neologisms and Definitions**

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1. ***Latinx*** is a gender-neutral or nonbinary alternative to Latino or Latina, terms used to describe people who are of or relate to Latin American origin or descent (Noe-Bustamante et al., 2020). In effort to create the most inclusive project possible, I utilize gender-inclusive terms rather than the more traditional identifying words like Latino or Latina.
2. ***Womxn*** encompasses all peoples who identify as a woman, intending to be inclusive of trans and nonbinary women of all races and ethnicities (Gupta, 2021). In effort to create the most inclusive project possible, I utilize a gender-inclusive term rather than the more commonly-used/traditional word woman.
3. ***Advocates and Allies*** refer to any employee or volunteer working to support domestic violence survivors.
4. ***Extended Reality (XR)*** is an umbrella term for all the immersive technologies that extend the reality we experience by either blending the virtual and "real" worlds or by creating a fully immersive experience by way of technological innovation (Marr, 2019).

## Chapter 1

### *The Interplay Between Language Barriers, Technology, and Domestic Violence*

*Vignette*

Marcella is a 34-year-old womxn from Guatemala City who recently left her husband after years of verbal abuse escalated into shoving and hitting. She lives in a rural town in North Carolina, and both the local police station and Womxn's Center lack a Spanish interpreter. She fears that her lack of English proficiency will render her unable to explain her situation to the police, and she is concerned that her misplaced immigration papers leave her susceptible to misunderstanding by local law enforcement and lead to her detainment or deportation. The interpreter available to her via telephone is unfamiliar with Central American and Guatemalan Spanish dialect, leading to several misinterpretations that create confusion for both Marcella and the advocates. Continuously referring to herself as "chapina" and identifying that she "tiene un gran clavo," Marcella's use of colloquial Guatemalan phrases confuses the Castillion translator, preventing her story from being told and subsequently limiting the care she is able to receive. Confused and overwhelmed by the lack of Spanish-language resources and non-receptive to the prospect of telephone interpreters, Marcella is unable to receive the support she needs.

Enter the concept of X-reality intervention, suited exactly for Marcella's needs. In a room within her local Womxn's Center is an XR set-up, complete with a large screen, a camera and a microphone to capture user movements and words. Upon activating the program, a virtual avatar appears on the screen, calibrated to understand the complexities of Marcella's situation and empathetically respond in Spanish in real time to her concerns and questions. Outfitted with a vocabulary and understanding of Marcella's specific dialect and cultural experience, the virtual avatar eliminates the risk of misunderstandings or mistranslations. Comforted by a human-like

presence that understands her experience and explanation, Marcella is able to access the comfort, support and resources that otherwise would have been unavailable to her.

*Introduction*

As a native of a state with a sky-rocketing Latinx population amidst its history of deep-seeded xenophobia, I have unfortunately witnessed the discrimination Texan Spanish-speakers face on many occasions. The financial and cultural appropriation of Latinx concepts, products, and traditions juxtaposes the widespread notion that Latinx immigrants should "just learn English" and "assimilate into American culture." While I have always rejected and rebutted such statements, it wasn't until a few years ago that I truly understood the consequences related to language barriers. I taught English in Los Llanos, Guatemala to a group of villagers, ages 8 to 45, the summer after my first year at Carolina. The countless variations of Mayan dialects, spoken by the majority of my students, created tremendous difficulties for the children as they struggled to learn English at a school with only Spanish instruction. The students felt extreme pressure to learn English for fear they would otherwise lose access to the opportunities that come with it, for example professional careers, higher education, or even healthcare. The discrimination and limitations these students face in their own country, one where almost 50% of all Guatemalans speak indigenous languages, opened my eyes to the complexities of language barriers and inspired me to explore ways to alleviate these issues around the world.

As a Spanish Translation minor, I have experience with the intricacies of translation and how sensitive, difficult conversations can be botched due to just one misinterpretation. It was not until my Spanish course with Professor Lucia Binotti, however, that I realized that the practice of

interpretation was not finite and could be improved upon. Our class work creating extended reality programs to help combat public health and safety issues within Spanish-speaking communities revealed just how effective technology could be in communicating difficult concepts amidst language barriers. The project that focused on providing support and assistance to Spanish-speaking domestic violence survivors caught my attention as an oft-ignored subset of the many healthcare limitations that exist in the U.S. The implications from our research and final projects inspired me to extend the concept beyond class. Thus, I posed the question: **Can extended reality (XR) alleviate the issues caused by language barriers and positively contribute to domestic violence prevention and treatment for the Latinx immigrant community?**

As COVID-19 wreaks havoc on life as we know it, high stress and tension combined with more time spent at home has had grave consequences for interpersonal family relations. The National Domestic Violence Hotline has consistently received a record 2,000 calls a day since the start of the United States' COVID-related lockdowns (Lang, 2020). Chicago's family services office, for example, announced that calls to its domestic violence hotline have tripled since the start of the pandemic, raising fears that there are not enough resources available to help the amount of womxn in need of support (Gielis, 2020). The threat of the virus has forced many domestic violence advocacy organizations to cease support groups and volunteer programs, and many shelters have been obliged to decrease their capacities (Lang, 2020). Unable to safely support and advocate for survivors in-person, allies and domestic violence resource centers are now forced to seek new techniques to protect and champion womxn from afar.

Domestic violence rates within the U.S. Latinx community mirror those of the general U.S. population, with nearly 56% of the Latinx community living in the U.S. personally knowing

a victim of domestic violence (*The No Más Study*, n.d.). However, many Latinx immigrant survivors are disadvantaged in the United States when it comes to receiving care and support due to immigration-specific complexities and language barriers.

*Immigration-Specific Obstacles to Receiving Support*

Within the Latinx immigrant community, womxn most commonly cited their fear of deportation as the reason for not seeking help while in an abusive relationship ("Domestic Violence in the Latinx Community," 2019). Amidst recently-inflamed discrimination toward the Latinx community in the United States, confidence in the American justice system is wavering. As part of a national study, 16% of Latinx respondents admitted having difficulty getting access to domestic violence shelter or law enforcement services due to immigration issues (*Realidades Latinas*, 2013). In interviews with survivors, researchers have found that the general vulnerability of undocumented immigrants combined with gender, national origin, and socioeconomic issues result in extreme fear and feelings of helplessness (Villalon, 2010). Immigrant-specific factors can also include those that impact aggressors. Stressors that trigger violent behavior include aggressors' immigration status, lack of English language proficiency, fear of deportation and cultural variables[1] (Menjívar & Salcido, 2016).

Without family or close friends to turn to while living in a different country, the isolation and loneliness can make even the most violent of situations seem inescapable (Villalon, 2010). Because of this, newly immigrated womxn experience social isolation which can exacerbate their dependence on their partner (Menjívar & Salcido, 2016). This, combined with a potential lack of English language proficiency, leaves them without a substantive job opportunity or ability to

[1] In terms of relevancy to this paper, I will not delve into aggressors' experiences and choose, rather, to focus on womxn's obstacles to receiving support and resources, as the survivors discussed are the most impacted by immigrant-specific factors and language barriers.

seek help, often contributing to some immigrant womxn's entrapment in violent relationships (Menjívar & Salcido, 2016). In cases in which the aggressor is a legal citizen, the power dynamics make it so the survivor wields no control in the relationship nor within the country (Villalon, 2010). Holding legal status and the threat of violence over their heads, aggressors can maintain full control over their partners (Villalon, 2010). Instances have also been reported of aggressors destroying immigration and identification papers, rendering their partners unable to prove legal status and, thus, susceptible to deportation (Raj & Silverman, 2016).

There are many immigrant-specific factors that play a part in dissuading Latinx immigrant survivors from reaching out to law enforcement. Some immigrant survivors can face a certain cultural pressure to not report or leave their aggressors. Older extended-family members can force and perpetuate traditional gender roles on womxn, such as submission to the "patriarch-figure" or the expectation to be caretaker of the house, and subsequently ostracize them for leaving an abusive relationship (Menjívar & Salcido, 2016). Law enforcement norms from a womxn's native country can also influence her likelihood to report her aggressor to the authorities. Interviewees from El Salvador and Guatemala, for example, laughed at the concept of calling the police, stating how rare it is for law enforcement officers to intervene in domestic violence cases (Menjívar & Salcido, 2016). Another major deterrent to seeking legal help can be survivors' lack of English language proficiency and the subsequent inability to communicate the situation to law enforcement agencies that often lack the proper translator resources. Perpetrators have even been known to use their knowledge of English to manipulate law enforcement and invalidate the claims of their Spanish-speaking partners, possessing the linguistic ability to explain their side of the story or trivialize the stories of survivors (*Realidades Latinas*, 2013).

*Language-Related Obstacles to Receiving Support*

Language barriers in the context of domestic violence are not a commonly explored issue. There have been some attempts to alleviate this obstacle; guides and programs to train community service providers on using interpreters to assist and support domestic violence survivors have been more prevalent in recent years (Iliffe & Wollongong, 2000). Despite these efforts, however, cultural gaps, misinterpretations, and an overwhelming lack of trained interpreters remain major obstacles for non-English-speaking survivors (Iliffe & Wollongong, 2000). Language barriers remain a deeper, more complex issue than many social scientists and advocates are willing to recognize.

Most domestic violence shelters and services are ill-equipped for Spanish-speaking survivors (*Domestic Violence in the Latinx Community,* 2019). The inability to find or fund bilingual staff members leads to major language barriers between survivors and allies, preventing womxn from receiving the care and support they need. In a national Latinx domestic violence survey, 16% of Latinx respondents had problems accessing resources due to services not being provided in Spanish, and 31% indicated that language barriers made receiving support much more difficult (*Realidades Latinas*, 2013). Latinx immigrant womxn are at a clear disadvantage when trying to access help and support due to the lack of Spanish-speaking advocates and interpreters within police departments and resource centers, especially if their aggressors speak enough English to falsely undermine their claims (*Realidades Latinas*, 2013).

While domestic violence proportionately affects all populations in the United States, due to language barriers, Spanish-speaking womxn are unable to access equal levels of care and support. The United States can be seen as a hostile environment for those who do not speak English; the unrealistic demands for assimilation and widespread English use are not feasible and

negatively impact immigrants' access to healthcare and resources. In the context of domestic violence, Latinx survivors disproportionately do not receive proper care, justice or resources due to language barriers. Lack of interpreters, manipulation by English-speaking aggressors, and miscommunications greatly impact Latinx immigrants' ability to benefit from advocates and allies' support. While this obstacle may not be intentional, the Latinx immigrant community faces daily ramifications from language barriers.

Members from the Latinx immigrant community consistently report that language and cultural incongruities between healthcare staff and themselves are the biggest obstacles to quality medical treatment (Doshi et al., 2020). Whether due to intimidation, fear of miscommunication, or frustration due to not having needs met, language barriers exponentially complicate non-English-speakers ability to receive the care and support they need.

Simply obtaining access to a Spanish translator to assist in the advocacy process does not guarantee survivors' meaningful access to care or support (Showstack, 2019). Reliance on remote interpreters is often unsatisfactory for clients/patients as the interpretations can be inaccurate and/or emotionless (Showstack, 2019). The use of euphemisms and colloquial terms in any given language is susceptible to misinterpretations, and when dealing with as complicated and sensitive an issue as domestic violence, slip-ups can completely destroy the potential for support and empathy (Showstack, 2019).

Misinterpretations in clinical settings can have grave impacts on patient-supporter relations, whether someone goes to a clinic for a headache or emotional support. An 18-year-old Cuban, Spanish-speaking man ended up paralyzed after a mistranslation of the word "intoxicado" led the doctors to treat him for the wrong ailment (Singh, 2018). In Cuban-Spanish dialect, it is common to use the word "intoxicado" as a blanket term that means someone is ill

due to something they ate or drank (Singh, 2018). Unfamiliar with this meaning, however, the doctors thought it meant he was "intoxicated," and thus treated the man for a drug overdose instead of the brain hemmorage he was experiencing (Singh, 2018). Precise language and word meanings articulate difficult concepts and situations in clinical settings; thus, it is crucial to avoid misinterpretations and utilize an interpreter with specific knowledge regarding the cultural and linguistic background of the Spanish-speaking patient in question.

Many linguists encourage a reframing of the language barrier issue: rather than putting the lack of language skills on non-English-speakers with phrases like "limited English proficiency," they suggest an emphasis on the healthcare system's lack of language access services (Showstack, 2019). In my opinion, the need to ensure meaningful access to mental and physical health care and resources should not be reliant upon linguistic abilities. There is a need for a system to guarantee interpretation and support regardless of language that is able to understand colloquial terms as well as portray necessary emotion and empathy. While interpretation via telephone and video platforms have shown to improve quality of care and increase accurate/relevant diagnoses, treatments, and guidance, studies have found that patients are still unsatisfied with their access to interpretation services (Jacobs & Vela, 2015). This is where the use of X-reality could be a welcome tool.

*Extended-Reality*

Extended-reality (XR) continues to expand into more professional settings as it shows potential for more than just data visualization and consumer experiences. XR allows users to instantaneously see and interact with artificial environments in real-world scenes. The technology can take several forms: whether used in video games to simulate stealing a car, in

planes to allow pilots to see projections of their altitude and speed, or in operating rooms for neurosurgeons to study a 3-D brain in preparation for surgery, researchers are steadily realizing the varying benefits of XR (*What Is Augmented Reality?*, 2017). While research regarding XR's full capacity is limited and new, studies convey optimism regarding the technology's ability to supplement and support healthcare and social work resources. The creation of an XR program to fill the gap in interpreting and properly convey emotions and meanings of Spanish-speaking domestic violence survivors' stories is well within the realm of possibility. It is up to advocates and allies, however, to decide whether these technology-centered goals are worth pursuing while causing minimal risk to survivors.

Recent studies focus on if XR can be helpful in impacting mental health and education and developing complex decision making skills (Felton & Wright, 2017). Implications from such studies suggest that XR can have a huge impact on improving someone's learning capacity and abilities, implying that such a method could have huge gains in various applications related to both educating and helping the various actors involved in domestic violence prevention and support (Felton & Wright, 2017). These promising results from preliminary studies suggest that XR could be an effective tool for centers and allies without access to bilingual advocates. Such studies prove that first-person perspectives routinely encourage greater empathy in participants, implying that XR could be utilized in a therapeutic format as well (de Borst et al., 2020). Due to the sensitive nature of studies involving trauma survivors, however, research into these implications is lagging.

The type of XR application that I choose to focus on is the use of virtual avatars. An avatar serves as a "virtual representation of a human being using artificial intelligence technologies and natural language processing" (Lok & Foster, 2019). A 3-D simulation that can

be accessed on any computer or tablet with internet connection, avatars are able to verbally communicate with users through speech and motion (Lok & Foster, 2019). Such interactions feature real-time conversations as a result of an input component set up to enable the avatar to understand and respond to sentences and gestures presented by the user (Lok & Foster, 2019). While present-day avatars have the capacity to discuss a singular topic, scientists and innovators intend to develop the technology to the point where avatars are able to handle any conversational topic that comes their way. Current research focuses on improving avatars' realism in order to facilitate more natural interpersonal interactions, looking to enhance elements such as display size, immersiveness, and audio quality (Lok & Foster, 2019). There is a great deal of evidence pointing to the fact that interactions with avatars elicit similar levels of empathy, understanding, and support as human ones (Lok & Foster, 2019). Such evidence supports the idea that avatars, as well as other forms of XR, could be utilized in linguistically, culturally, and/or topically sensitive situations.

*Research Plan and Methodologies*

Part of the reason that Latinx domestic violence survivors face so many obstacles in receiving support and resources is due to language barriers; thus, the pursuit of a technological tool to circumvent translation issues could lead to important improvements in the level of care such survivors receive. There is promising, productive research into the field of XR in terms of the effects it can have on its participants; the concept of utilizing technology as a tool that would ameliorate language barriers and access to care in a culturally-sensitive way has the potential to permanently impact the field of social work. This currently untouched topic embraces innovation

and seeks to pave the way for further research into the ways that XR could be utilized in mental health, translation, and social work settings.

In order to truly be able to evaluate the potential of XR in ameliorating language barriers and other obstacles for Latinx immigrant domestic violence survivors, I compare expert opinion with case studies of recent applications of such technology in clinical settings. As I lack the training to expertly approach sensitive, traumatic topics such as domestic violence, I chose to gain insight from advocates and allies rather than survivors. Domestic violence advocates are experts in their field and are able to comprehensively evaluate the prospect of XR and its effectiveness in eliminating the obstacles to supporting Latinx survivors. I consulted a variety of advocates ranging from outreach coordinators and prevention specialists to legal counselors, encompassing the variety of places where survivors may go to seek support. I aimed to get as many different perspectives as possible from a sample of domestic violence organizations and clinics in order to truly understand the obstacles advocates face in providing support and resources to Latinx immigrant survivors as well as the viability of XR to serve as a useful resource.

Prior to meeting with anyone, however, I conducted a review of prior applications of XR in clinical settings, focusing on cases that could be transferable to the domestic violence support domain. Due to the innovative and emerging nature of this understudied topic, I pursued an interdisciplinary combination of methods to facilitate a comprehensive understanding of if XR can reduce some obstacles for Latinx survivors and their advocates. The end result of this research is a comparison of real-life XR applications with suggestions, opinions, and concerns of the expert advocates. Because, to my knowledge, there have been no applications of XR technology in a setting in which both language barriers and domestic violence trauma are

considered, my conclusion requires a comparison of the results of each method in order to best tailor my findings to the Latinx immigrant domestic violence survivor community. Due to the theoretical and ever-developing nature of XR, I expected very few of the advocates I consulted to be familiar with the technological suggestions. However, their vast experience and knowledge when it came to the general topic allowed them to see such applications from a perspective that successfully informed future research direction. From the comparison of my conversations with the advocates and the case studies of real-life XR applications, I expected to be able to form an idea of the practicality of the utilization of such technology in a domestic violence survivor resource capacity and evaluate if it could serve a valuable role in the survivor support process.

In Chapter 2, I will discuss and explain several applications of XR in clinical settings, noting the perceived successes and complications for each and hypothesize about how each could be utilized in a domestic violence support setting. This chapter will serve as a literature review, informing the reader of current research into the application of XR in clinical settings as well as the gaps I intend to fill with my own research. In Chapter 3, I will examine and analyze the ethical considerations to take into consideration while exploring the use of XR with trauma survivors. I will summarize the results of my personal communication with the advocates and compare them with my research into various XR applications in Chapter 4 and, lastly, conclude my findings in Chapter 5.

## Chapter 2

### *Literature Review: Applications of Extended Reality*

This chapter intends to shed some light onto an otherwise confusing topic to those not well-versed in XR. In order to better understand what applications of XR have been explored and if they could be helpful as a domestic violence support and/or translation tool, I examined several case studies into XR applications in clinical settings. A lot of research has gone into how XR can facilitate more efficient modes of teaching, stronger relationships, and greater empathy, but no study has examined a use that combines the three. Thus, I analyze each case in order to evaluate whether the latter could prove to be fruitful. Since there is a gap in the literature regarding such a combination, it is even more important to be able to understand and evaluate what makes XR powerful and helpful in order to be able to visualize it in the proposed subfield. Especially in regards to an application that works with an at-risk population and a highly sensitive topic, the concept of utilizing technology to pull together the various elements necessary to truly support Latinx immigrant domestic violence survivors in a culturally sensitive way is something that needs to be explored for the sake of the field and the proposed beneficiaries.

Throughout my research, two kinds of XR applications utilizing virtual avatars have emerged as possible contenders in regards to my research question. The first application involves a virtual avatar serving to walk through with survivors the next steps to receive legal, medical, or emotional aid in a way that eliminates the use of a third-party translator, customized in a culturally and emotionally sensitive way to facilitate optimal understanding of whatever topic being expressed. The second use could allow participants to observe, interact, and create the perspective of an avatar experiencing healthy or unhealthy interpersonal relationships, with the goal of facilitating for users empathy for survivors as well as a better understanding of how to

healthfully cope with certain stressors in domestic settings. As no current studies breach either of these specific XR applications of virtual avatars, I focus on case studies that explore the different elements involved in each proposed application. Looking at the potential of XR as a replacement for human-interaction in terms of participant engagement and facilitation of empathy, I look to understand the feasibility of the technology in a real-life application. In analyzing the results and conclusions of each study, I am better able to evaluate each use of XR and ultimately compare them with the opinions of the experts in order to form a conclusion regarding XR's potential.

*Teaching*

The first studies I analyzed looked into XR serving as a virtual learning environment in a medical setting. The study conducted by Olivier Courteille, Anna Josephson, and Lars-Olof Larsson (2014) explored the impact Virtual Clinical Encounters (VCE) have on the interpersonal and socioemotional behavior of its users. The scientists utilized medical students as their test subjects in effort to bolster students' communication and interpersonal skills with patients, something that is often neglected in medical school but holds as much importance as proper diagnosis. They intended for the use of VCE in the form of a virtual patient to serve as a more targeted individualized learning technique, simulating real-life clinical encounters. Courteille, et al. (2014) based their study on previous research that highlighted the strong impact socioemotional learning, accomplished by tools like VCE, has on enhanced understanding and knowledge retention. Part of this impact comes from the multi sensory presentation of the graphics and audio associated with XR; such learned interpersonal behaviors and knowledge attained as a result of VCE have been shown to translate to real-life interactions.

In Courteille et al.'s study (2014), thirty medical students were given the virtual avatar patient of a 59-year-old woman experiencing a variety of mental health and physical ailments and were instructed to communicate with her in an empathetic yet informative way to properly treat and diagnose her. In interviewing the participating medical students, the scientists ascertained that the virtual avatar patient allowed for "trustworthiness and consistency," facilitated great "emotional engagement and knowledge retention," and appeared to the students as a "real patient with real psychological concerns." While the exchanges threw off participants at first due to the strange nature of interacting with such a human-like avatar, the realism ingrained in the actions and words of the avatar allowed users to immediately relate to and comfortably engage with the virtual patient. An interesting find from Courteille et al. (2014) showed that larger screens, and therefore larger patient faces, correlated with greater levels of participant immersion and engagement, suggesting future implementation of larger screens for interaction with virtual avatar patients. The study was somewhat limited due to the subjectivity of gauging interpersonal and socioemotional behavior; however, overall, the researchers found that the VCE was meaningful for participants and has the potential to encourage positive shifts in interpersonal behavior and greater knowledge retention.

A study by scientist and scholar Susan Persky (2011) explored literature regarding recent immersive virtual environment (IVE) technology, outlining perceived advantages and challenges of using such technology. Her main takeaway as to the potential benefits of implementing IVE in health care communication reiterated that such experiences translate well to behavior in real-life environments, serving as successful tools for exposure therapy for patients with phobias or anxiety. She details that this success is attributed to the fact that virtual avatar patients can be programmed to give off very human-like nonverbal behaviors and expression of empathy,

making them worthy tools for teaching and instructing. Persky (2011) refers to two relevant challenges in the utilization of IVE. First, there are a variety of technical limitations related to the act of creating a naturalistic virtual avatar patient with capacity for spontaneous interactions. To achieve the desired level of naturalism, a technician would have to create and install complex high quality voice recognition, a complicated artificial intelligence system, and an extensive database with a multitude of pre-recorded phrases to facilitate realistic human-interaction. Without such additions, the virtual patient would be limited in its communication abilities, prohibiting the unscripted "give-and-take" typical of human interaction that is key to the success of IVE. The second major challenge of IVE is the cost of setting up such a program. Not only is the equipment expensive, but the time and labor necessary to create and install the software is costly as well.

Both studies point to the positive benefits of virtual avatar patient use. The results of each analysis suggest the potential of such applications of XR in a support setting, provided that technicians are able to create and install enough complex measures to ensure the most naturalistic human-interaction experience. The multi sensory presentation combined with heightened naturalism and realism can lead to human-like interactions with avatars, leading to similar levels of engagement and knowledge-retention as those that come from person to person conversations. While each study is somewhat dated when it comes to the discussion of innovative technology, the lack of more recent, relevant studies point to the true gap in literature regarding this particular field of study. Nevertheless, the results from Courteille et al. and Persky's studies remain the same and point to the vast potential virtual avatars have when it comes to standing in place of human interaction, suggesting that they could be used to facilitate

meaningful conversations with domestic violence survivors or expertly demonstrate healthy boundaries and interpersonal relationships.

*Empathy*

Next, I examined a study conducted by researchers Benjamin Lok and Adriana Foster (2019) that looked into the potential of XR in facilitating empathy. They explored the efficacy of virtual avatar patient scenarios in generating immediate empathy in users, investigating the ability to teach empathy. Observing medical students' interactions with virtual avatar patients, Lok and Foster (2019) created quantitative measurements for gauging verbal and non-verbal empathetic responses. They recorded the medical students' replies to the virtual avatar patients' concerns and questions as well as each student's facial affective mirroring, eye gaze, head nods, and body leaning, the indicators of physical empathetic responses. The researchers concluded that interactions with virtual patients did, in fact, elicit empathy levels similar or superior to those from other forms of empathy training, suggesting that a technological approach could potentially replace person to person therapy techniques. The virtual patients utilized in the study provided users with ample opportunities to repeat the interaction and feedback regarding each response, allowing the medical students to refine and improve upon their empathetic words and actions. Eliminating the need for a person to endure the repetition of empathy training, the use of virtual avatar patients has the potential to be a real asset in behavioral instruction.

Attempting to answer the age-old question of whether empathy can be taught, this study suggests that certain XR applications can successfully replace person to person interaction in the instruction and facilitation of empathy. In a healthy-relationship teaching setting, such application could be very useful in eliciting real-life emotion and kindness without creating

in-person traumatic situations or scenarios. The fact that medical students were able to have a ultimately successful trial and error opportunity to learn and develop empathy towards a virtual patient bolsters the idea that virtual avatars could serve as a successful instruction tool.

## Chapter 3

### *Literature Review: Ethics of Emerging Technologies*

In exploring the potential XR has in ameliorating obstacles caused by language barriers in the context of domestic violence, it is important to address the potential ethical limitations in assessing new technology in relation to survivors. While XR has the capacity to make a huge impact in the world of mental health and support, there are different fields of thought in regard to the ethics and complexities of performing research in the context of complicated and sensitive topics such as domestic violence.

#### *Domestic Violence Research*

While violence's prevalence around the world necessitates it as an important research subject, there are different aspects to keep in mind when approaching the subject. Many NGOs and world leaders attest that more research surrounding the causes of violence could lead to major societal change; however, the majority of the research regarding interpersonal and domestic violence focuses on the ethical issues that arise with such investigation.

Violence generally is a difficult concept to define, with various cultural influences and differing moral codes impacting what each person considers to be true violent acts (Fraga, 2016). Thus, the diversity of acts encompassed by the term "violence" lends itself to controversy even without the severity of actions being considered (Fraga, 2016). Because violence very rarely has a strict definition, it is difficult to measure objectively, rendering it difficult for any concrete research to be performed (Fraga, 2016). While organizations such as the World Health Organization encourage countries, law enforcement agencies, and sociologists to track and analyze acts of violence, ultimately, its arbitrary yet sensitive nature makes any real data hard to

analyze (Fraga, 2016). There is also major gender-bias within research regarding violence, with many researchers questioning the validity of data due to stereotypes regarding womxn as the traditional victim (Fraga, 2016). In order to avoid gender bias and attempt a concrete definition of violence, international organizations have pushed for greater interviewer training, in hopes that more operationalized, strict processes for assessing and collecting reports of violence will increase the validity and accuracy of data collected (Fraga, 2016).

Interpersonal and domestic violence are extremely sensitive topics to discuss, especially with survivors. Simply mentioning a certain violent act can invoke incredible fear and pain in a subject, making it crucial that researchers approach the subject of violence with extreme tact and care. Therefore, the most important ethical concern when performing domestic violence research is unintentionally causing harm or distress to respondents or research participants (Ellsberg & Heise, 2002). Interviewers also run the risk of traumatizing themselves while listening to the often horrific accounts of violence (Fraga, 2016). How to discuss violence is as important as how to respond to and understand it, making the collection of research regarding violence even more complicated (Fraga, 2016).

Another major concern for domestic violence research is the complicated nature of confidentiality. Fear of being exposed as a survivor to friends and family, or in extreme cases to their own aggressors, is a major deterrent to womxn coming forward to take part in research studies (Ellsberg & Heise, 2002). Even if privacy can be guaranteed by researchers, due to many womxn's hesitance to come forward as a survivor of interpersonal violence, it can be difficult to find enough research participants (Ellsberg & Heise, 2002). Interviewers in Zimbabwe and Nicaragua, for example, went to extreme lengths to locate and interview survivors, even venturing to the nearby river with the subject to do laundry in order to get a detailed account of

the violence (Ellsberg & Heise, 2002). With the ultimate goal of maximizing benefits and providing survivors with the respect they deserve while trying to bring about societal change, domestic violence is a worthy, albeit complex, topic to research and analyze. When discussing a womxn's mental health and safety, it is crucial to eliminate risks of harm, whether as a result of an insensitive interviewer or a privacy breach that exposes the subject to their aggressor. With all of these risks in mind, domestic violence research is only encouraged in the most careful of settings in which the interviewer is able to ensure the subject a safe, respectful environment in which survivors can tell their stories, minimizing the circumstances in which it can take place.

*Challenges and Dangers to Extended-Reality*

With innovators continuously developing and improving upon XR, there is very little research out about the implications of using the technology on human subjects. While many technology gurus laud XR for its seemingly endless list of abilities, many researchers and technology experts encourage caution when utilizing the tool.

The danger of XR comes from the superrealism of the technology, allowing every component to appear as "real" to the participant (Slater et al., 2020). This, combined with the complex inner coupled system of components that monopolize the participant's senses, makes users unable to differentiate the virtual world from the real one (Kenwright, 2019). Children and vulnerable populations especially run the risk of being confused by XR, which can lead to extreme emotional, cognitive and behavioral changes if not properly addressed (Slater et al., 2020). In cases in which XR informs participants on the implications of violent actions, there can be serious psychological harm (Slater et al., 2020). Experiencing stressful situations or violence through virtual embodiment can trigger Post Traumatic Stress Disorder in participants, invoking

genuine fear and distress (Slater et al., 2020). With a lack of legal or ethical responsibilities in a virtual world, XR that includes violence can desensitize users to violent acts and elicit a misleading understanding that real-life actions can go without consequences (Slater et al., 2020).

While there is very little literature regarding the risks and ethical implications of XR, the existing research suggests that use of such technology should be approached with caution. The power of XR lies in its ability to persuade and effectively instruct participants; thus, in cases of sensitive or potentially traumatizing topics, XR facilitators should thoroughly inform and prepare users for what they are going to experience, allowing those with past trauma to opt out if virtual embodiment could trigger their PTSD. With the mindset that XR is an instructive tool, participants can be reminded that the virtual world is not necessarily reflective of the real one, avoiding instances of desensitization.

Recalling these discussions of the ethics regarding domestic violence research and the use of XR will allow me to better conduct my analysis in Chapter 4. Keeping in mind the complexities of both, I will utilize this literature to guide my exploration into the potential of XR to alleviate issues faced by Latinx immigrant domestic violence survivors when seeking support and aid.

## Chapter 4

### *Expert Opinion & the Practicality of XR*

In my quest to evaluate the efficacy of XR application in a domestic violence support setting, I turned to the experts. I keep the descriptions of each advocate to a minimum, intending to keep their identities shielded for ethical and privacy considerations. As their individual identification is not relevant to the opinions and perspectives they share with me, their inclusion is not necessary for this project. Regardless, representing a variety of organizations and specializations, the advocates and allies I consulted provided me with the depth and perspective necessary to compare my technological and ethical research with expert opinion regarding the pros and cons of using XR in support, translation, and instruction settings.

I first spoke to a representative from a state-wide domestic violence prevention and support organization, learning about the organization's experience with statewide violence prevention efforts and diverse populations. Next, I consulted two representatives from a university-sponsored organization that primarily serves the specific school's community. Lastly, I spoke with two domestic violence legal clinic faculty advisors as well as one of their bilingual clinic associates, relying on personal connections with the two advisors to facilitate conversation into the legal side of domestic violence support. Each advocate I spoke to had a variety of experience working with translator services while working towards domestic violence prevention and support with the Latinx immigrant community. While they each possessed varying levels of XR awareness and its theoretical application in domestic violence support and prevention settings, their experiences, perspectives, and expertise provided me with helpful opinions regarding the topic.

I faced a few limitations while finding expert advocates to reach out to, namely due to the shortened time frame and complications from the pandemic. Thus, I was unable to achieve a necessarily diverse group of advocates, as the 5 women I spoke to are all within the 30-60 year old age range and are caucasian. Nevertheless, each possesses 5+ years of experience working with domestic violence survivors and the Latinx immigrant community in particular, providing me with a wealth of knowledge when it comes to their particular perspectives and opinions. I chose to focus on talking to advocates who had meaningful experience working directly with survivors regardless of their familiarity with XR. I prioritized experience with survivors rather than technological literacy in order to best understand the practicality of the use of such innovative technology with this vulnerable population. Should I continue my research in the future, my next step will be to discuss the feasibility of such XR applications with technology experts to better inform the actual construction of such a virtual avatar.

My conversations with the advocates were free-form but essentially followed the same format. I inquired about their experiences working with Latinx domestic violence survivors in general, the impact, if any, language barriers have on their ability to give support, and, lastly, what their thoughts were on the utilization of virtual avatars in a domestic violence support setting. I will present their opinions on the two most relevant topics, language barriers and XR, and then compare them to my findings from the technology and ethics literature reviews covered in chapters 2 and 3.

*The Impact of Language Barriers on Giving Support*

The main takeaway from my conversations, albeit its predictability, was that language barriers have a huge impact on advocates' ability to connect with and provide support for

survivors. My research findings regarding the impact of immigrant-specific factors on Latinx immigrant domestic violence survivors proved to be true based on the experts' experiences. While the organizations and clinics are able to utilize "language lines," tele-conference interpreter services, or third-party interpreters, the use of any outside service creates an awkward dynamic between each conversant and doubles the amount of time the interactions take. The choppiness that results in the conversations limits the flow of the discussion and thus the connection between participants. Especially for legal work, a personal connection is crucial for the empathy required of the lawyer to be able to advocate for the client in the strongest way possible. Lawyers working with survivors are expertly trained in trauma-informed communication that allows them to approach difficult, sensitive subjects in a tactful way; adding in a third-party to the conversation renders this skill somewhat useless if the interpreter is unable to portray empathy and care in the same way. In the case in which the advocate is bilingual and can speak directly to the survivor in Spanish, differing dialects and accents can complicate even the most straight-forward conversations.

A factor that hadn't come up as much in my background research findings but was something I personally was aware of due to my own interpreting experiences was the complications that can arise from advocates' lack of cultural understanding. Even in the best-case-scenario of Spanish-speaking survivors being able to converse and work with bilingual advocates, differences in cultural experience and understanding can skew the resulting translations. Factors impacting a survivor's experience often depend on their cultural background, as discussed previously in the immigrant-specific factors section. Cultural ignorance can lead to misinterpretations due to the use of unfamiliar colloquial terms, as exemplified in the vignette; at the same time, survivors' needs and experiences differ greatly as a result of cultural

variances. Not taking into consideration these differences can hinder communication, limit connection, and result in lesser quality support and resources for survivors. Thus, the advocates maintained that a culturally-aware interpreter is just as important as a bilingual one. As it is almost impossible to find an interpreter catered to every survivor's specific experience, dialect, and culture, the experts agreed that there was a great need for a versatile solution accessible to all advocates, organizations, and clinics.

*XR in the Context of Domestic Violence Support*

When approached about the potential utilization of virtual simulation as a resource for providing support and resources to Latinx immigrant domestic violence survivors or a tool for healthy-boundary instruction, the advocates unanimously supported the concept but remained skeptical of actual application. One advocate's initial thought was that the use of a virtual avatar gives survivors a greater level of anonymity when discussing their situation, allowing them to potentially be more open when discussing difficult subjects. In the context of using a virtual simulation as a teaching element to demonstrate healthy boundaries and relationships, the same advocate noted that the ability to limit human interaction serves an ethical purpose. Taking out the need for another human to participate in the user's exploration of interpersonal relationships, XR can serve to eliminate the possibility of bringing up a sensitive topic or triggering past trauma for instructors.

In terms of accessibility, the advocates agreed that the utilization of technology would greatly ameliorate the support and resources they are able to give to survivors. As long as a clinic has the proper technology set-up and internet connection, virtual simulations can be utilized in most places around the world. Use of an XR program also gives conversations a level of

flexibility that they otherwise would not be able to have. Advocates strive for free-flowing conversations and avoid a set list of questions that pry too much, allowing survivors to limit and control what personal information is shared. Especially in the context of undocumented immigrants, this flexibility is crucial for survivors' comfort. The use of virtual simulation could relieve advocates from having to prepare a rigid set of questions and answers in advance due to the pressure of preparing for interpretation, subsequently giving survivors the room they need to feel comfortable discussing their specific situations. As conversations taking place with interpreters take double the amount of time, use of a virtual avatar would also save advocates and clinics a lot of time and energy.

Advocates highlighted the advantages that using XR could bring to the table as innovative use of technology becomes the norm. Younger generations are growing up in a time in which technology is increasingly becoming the mode for almost everything; one advocate remarked that resources need to be where the people are most comfortable, so it makes sense to move with the times and embrace technology. Especially in reference to the concept of using XR to explore what healthy relationships look like, children would be most apt to benefit from and be comfortable with the utilization of technology in a learning environment. One advocate brought up her optimism regarding the use of XR in reference to norms-work and changing the perception of social norms that are ingrained in people's minds. Difficult to change in a lasting and sustainable way due to the traditional nature of social norms, this particular advocate was optimistic that XR could positively alter users' internal, subconscious bias when it comes to domestic violence and interpersonal relationships.

Despite the benefits noted by each advocate regarding the theoretical utilization of XR in these proposed settings, they maintained concern when it came to the actual application in a

domestic violence setting. Most focused on the traumatic nature of the conversations that would be had, stressing that a lot of thought would need to go into the creation of a virtual avatar as it would set the tone/environment/space for survivors to share. One advocate was reluctant towards the reliance on a virtual avatar, expressing that her own experiences with automated responses resulted in unanswered questions when it came to specific inquiries. Advocates also expressed concern that for survivors less comfortable with technology, a virtual avatar could be especially overwhelming or confusing, thus limiting their comfort regarding sharing their experiences. Lastly, advocates expressed concern with the use of technology in regard to its ability with which to be hacked or tampered. The potential for personal information to get out due to reliance on technology was too great for some of the advocates to be willing to consider the use of XR without several security checks in place.

*Putting It All Together*

Overall, expert opinion matched the optimism levels of recent XR researchers, bolstering the idea that virtual simulation could be beneficial for use in relation to domestic violence survivors. The advocates' hesitation towards immediate use of the technology, however, suggests that there are several aspects of virtual simulation that need to be addressed before being used in domestic violence settings.

The general consensus of the advocates is that there is a need for a tool to surpass language and cultural barriers that limit survivors' access to resources and support. In reference to the concept of survivor use of a virtual avatar, however, advocate opinions were split. The advocates all acknowledged that the increase of accessibility and flexibility, the relative anonymity for survivors, and the ability to transcend cultural and linguistic divides were major

advantages of utilizing a virtual avatar. The results of Courteille et al.'s study (2014) supports these sentiments, pointing to the high levels of trust, emotional engagement, and knowledge retention that came from interactions with virtual avatars, revealing their ability to simulate precise, human-like interaction. Combined with the implications from Lok and Foster's study (2019), namely that engagement with virtual avatars resulted in empathetic responses similar or superior to that of person to person kinds, general scientific consensus seems to believe that technology is capable of creating virtual environments in which people feel comfortable and safe.

The major concerns, however, regarded the complexity of XR, the risk to privacy in the case of hacking or tampering, and the amount of care and effort necessary to create a safe environment that is actually beneficial to survivors. Such attitudes reflect the innovation and growth still necessary to create a virtual avatar application devoid of problems. Persky's study (2011) reiterates some of these concerns, emphasizing the limitations on the creation of a truly naturalistic virtual avatar that has the ability to communicate and respond in spontaneous ways that mirror those of human interactions. Unfortunately, XR has a long way to go before these technological advances are secured to the point of eliminating the concerns brought up by both the advocates and Persky. In order to successfully make the necessary changes and advances, domestic violence and language barrier researchers would need to devote a multitude of time, energy, and money into solving the technological problems. In order to truly make the virtual environment as safe as possible, it is likely that hundreds of advocates would need to be consulted in the construction of the avatar response database, not to mention the variety of translators necessary to encompass the diversity of language dialect and cultural variances.

The possibility of these actions is further clouded by the ethical limitations of domestic violence research discussed in chapter 3. Fears of causing harm or distress to researchers and/or participants and violating survivors' confidentiality and privacy complicate the testing of virtual avatars in the context of domestic violence survivors (Ellsberg & Heise, 2002). The infeasibility of frequent testing complicates the fact that there would need to be dozens of more studies regarding the use of XR with vulnerable populations due to the super realism of the technology and the risk of extreme emotional, cognitive and behavioral impact on participants (Slater et al., 2020).

Lastly, survivors' readiness to utilize such innovative technology also needs to be considered. Dealing with a virtual avatar can be startling, and those unfamiliar with such forms of technological innovation may not experience the benefits from use. Most likely, advocates would need to wait for younger generations to be able to utilize XR and see the benefits from virtual avatar use.

Despite these ethical and technical concerns regarding the practicality of XR use with survivors, advocates were more confident in reference to XR use in the general context of teaching and demonstrating healthy interpersonal relationships. Such sentiment matches the optimism of Courteille et al. and Lok and Foster's studies (2014, 2019), suggesting that XR can effectively encourage knowledge retention and facilitate empathy in participants, thus proving its potential to serve as an informative teaching tool. As this suggested application does not feature as many ethical limitations due to the fact the participants in mind would be members of the general population rather than an at-risk population, there are much less barriers to its testing process or actual use. The technology also does not have to be as precise, meaning that not much more development or innovation would have to take place before virtual avatars could be used in

classrooms across the country to facilitate demonstrations of healthy boundaries and interpersonal relationships.

## Chapter 5

### *Conclusions*

While there are many benefits to using a virtual avatar to alleviate linguistic and cultural barriers and eliminate hesitations to approaching sensitive subjects, there needs to be a lot more research before virtual simulation can safely be utilized in a domestic violence setting. This does not mean, however, that XR cannot be used at all to aid domestic violence prevention. Advocates and researchers agree that virtual avatars could have success as an instruction tool to demonstrate what healthy boundaries and relationships look like. As the world continues to embrace technology in all realms of life, and as XR faces unprecedented innovation and development, virtual avatars could serve an important role for domestic violence prevention in the future.

While technology growth and progress certainly makes the complex development of a virtual avatar outfitted with linguistic, cultural, and empathetic capabilities to serve as a resource for Latinx immigrant domestic violence survivors possible, the ethical limitations will continue to prohibit the achievement of such an application for the foreseeable future. It will require the collaboration of hundreds of advocates, survivors, and XR innovators to come up with a way to surpass the ethical concerns and create and test the virtual avatar in a safe way.

I recommend that actual XR utilization begin in an instruction setting, working with people across the country to demonstrate and showcase what healthy boundaries and interpersonal relationships look like as well as how to achieve them. The ability of virtual avatars to facilitate empathy and knowledge retention as well as instruct transferable behavior instills a lot of optimism in me that this tool could succeed in bolstering advocates' domestic violence prevention efforts. Until survivor use of virtual avatars is feasible, this utilization of XR could

serve as a stepping-stone to further development and use in other social work and healthcare realms.

I hope to see future development of virtual avatars in the context of social work, mental health, and translation settings. This form of virtual simulation is ripe with potential to alleviate some of the ramifications that come with language and cultural barriers. Further innovation and advances are definitely necessary to eliminate some of the more technical concerns of researchers and advocates, including a more niche database to improve the response abilities of the avatars, security systems to ensure the protection of personal information, and the widespread accessibility of the software required to set-up such technology. I'm not sure what it takes to eliminate the concerns regarding testing out the application with domestic violence survivors, but I am hopeful that domestic violence allies and researchers can work to find a solution. It will certainly take a lot of effort and collaboration between advocates to ensure a safe environment for exploration and research, as well as the willingness of certain survivors to take part in such experimentation.

As a prospective future lawyer, I plan to incorporate this project into further research and my ultimate career. I aspire to be an advocate for marginalized populations around the world and intend to do everything in my capacity to work to eliminate the obstacles caused by language barriers in all aspects of my clients' lives. I hope to be able to expand this project and continue my efforts to work with technology and XR experts to develop a program feasible of linguistic and cultural understanding as well as empathetic communication.

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