Through the Eyes of a Bystander:

Understanding VR and Video Effectiveness on Bystander Empathy, Presence, Behavior, and

Attitude in Bullying Situations

Kelly A. McEvoy

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James D. Ivory, Chair

Adrienne H. Ivory

Oyewole K. Oyekoya

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ABSTRACT

Peer bullying is a widespread and longstanding problem in school settings. Teachers, students, administrators, government, and researchers alike have all tried to combat bullying through bullying prevention campaigns. One strategy used in bullying prevention campaigns is to call on bystanders in bullying situations to take responsible action. While many different forms of campaigns, including print and media campaigns, have aimed at trying to reduce the presence of bullying in schools by informing bystanders, there is still a need to find new strategies for reducing bullying behavior. One potential media form that could be used in bullying prevention campaigns is the use of virtual reality. Virtual reality simulations allow for a more immersive environment than other media forms, as the medium is capable of creating feelings of presence, various perspectives, and empathy in its users. This thesis reports results from a one-factor, three-condition laboratory experiment comparing responses to portrayals of a bullying situation in which users ($N = 78$) were placed in the perspective of a bystander in a bullying scenario across three different media stimulus conditions: a customized virtual reality condition, a non-customized virtual reality condition, and a video condition. The study compared effects of the media stimulus conditions on empathy, attitudes toward bullying victims and bullying, and anticipated future bystander behaviors, as well as presence and other outcomes related to perceptions of bullying. While it was hypothesized that the study would find stronger effects on empathy and anti-bullying bystander attitudes and anticipated behaviors among the

VR conditions, and in particular the customized VR condition, the study found no differences between media stimulus conditions for any outcomes except a significant effect on empathy, with participants in the video condition tending to report more feelings of empathy for participants than participants in the other two conditions, and perceptions of bullying as a problem in the participants' school, again with scores highest in the video condition. This pattern of results was further explored in a follow-up qualitative focus group study ($N = 10$), in which trends from two focus group sessions featuring 10 participants indicated that the quality of the virtual reality graphics effected empathy, a lack of bystander intervention options reduced effectiveness, and customization cues had little effect on participants. Results from the laboratory experiment and follow-up focus group study suggest that in some cases, it may be difficult to use VR simulations to elicit empathy-related prosocial responses. While further study is needed to clarify what features of VR simulations might make them most effective in encouraging certain prosocial behaviors, findings here suggest that photorealistic graphics should be used in VR simulations to evoke empathy, additional intervention capabilities in VR simulations could make them more effective in producing bystander intervention behavior, and that customization cues should be prominent and possibly individually tailored.

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INTRODUCTION

Peer bullying is a prevalent problem for students in school settings beginning as early on as elementary school and occurring as late as post-secondary education. A 2010-2011 School Crime Supplement study from the National Center for Education Statistics and Bureau of Justice Statistics found that 28 percent of students in grades 6-12 experienced bullying (National Center for Education Statistics, 2014). Many different types of peer bullying occur, including physical, verbal, relational, and cyber (Wang, Iannotti, & Nansel, 2009). Regardless of the type of peer bullying victims endure, bullying has serious effects on those engaging in bullying, being bullied, and witnessing bullying. Effects include but are not limited to mental health problems (Kaltiala-Heino, Rimpela, Marttunen, Rimpela, & Rantanen, 1999), physical health complaints (Rigby & Slee, 1999), decreased academic achievement (Kochenderfer & Ladd, 1996), and criminal behavior (Olweus, 2002). For example, Olweus (2002) found that those who experienced bullying or were bullies were more likely to engage in criminal behavior. Rigby and Slee (1999) found that students who were involved in bully-victim problems at school were more likely than their peers to report having suicidal ideations. Due to the damaging effects of peer bullying, parents, teachers, researchers, and government alike are concerned with understanding how to stop and prevent peer bullying (Polanin, Espelage, & Pigott, 2012).

To combat the problem of bullying in schools, educators, government, and students correspondingly have created several anti-bullying campaigns and intervention strategies. Anti-bullying programs utilize diverse implementation strategies. They also focus on different issues surrounding bullying, such as bullying effects, intervention, and reconciliation. An early anti-bullying school program was the Olweus Bully Prevention Program, which was first implemented in Norway after a bullying incident that lead to suicide, and is now even

implemented in schools in the US (Olweus, Limber, & Mihalic, 1999). This program was created to help students identify bullies in school and to learn to cope with bullying effects (Olweus et al., 1999). Another early classroom-based program was The Second Step Violence Prevention Program, which was developed to help students increase their social competence (Ferguson, San Miguel, Kilburn, & Sanchez, 2007). A more recent bullying prevention program focused on reconciliation between victims and bullies (Ahmed & Braithwaite, 2006). One intervention technique used recently to help prevent and stop peer bullying is to target bystanders in the bullying situation and teach them how to act in a bullying situation *(*Vaillancourt, Hymel, & McDougall, 2009). This strategy was used in the popular 2012 *Be More Than a Bystander* campaign.

In 2012, the Ad Council and partners developed numerous Public Service Announcements (PSAs) for a campaign called *Be More Than a Bystander*, which aimed at empowering bystanders to take action in bullying situations (Ad Council, n.d.). The series of PSAs was targeted toward students and parents to increase education about bullying prevention. The PSAs directed the audience to go to StopBullying.gov, a US Department of Health and Human Services website, to learn more about bullying prevention, particularly about safe bystander actions students can take in a bullying situation. According to the Ad Council, in the six months following the campaign launch, the PSAs and the StopBullying.gov website received an increase in viewership (Ad Council, n.d.). In addition, during this time period, there was an overall increase in online searches of bullying-related information and available resources. The *Be More Than a Bystander* campaign is part of a larger Ad Council and partners campaign called *The Bully Project*, and part of the US Department of Health and Human Services *Stop Bullying* campaign (Ad Council, n.d.).

Given the success of online and television PSA campaigns, such as the *Be More Than a Bystander* campaign, it is worthwhile to explore the efficacy of other media formats in bystander bullying prevention campaigns, as combating bullying is a continual matter of global importance. One potential avenue is virtual reality, which provides a more immersive experience than most other forms of media.

Virtual reality, also referred to as an immersive virtual environment technology, is an effective methodological tool to study learning, perspective taking, and attitude and behavior change (Steuer, 1992). Immersive virtual reality is capable of creating presence for participants, allowing them to feel mentally and physically engaged in virtual reality (Steuer, 1992). In social situations, this allows for users to imagine what it feels like to be in that particular circumstance. Perspective taking allows for individuals to experience a different perception of social situations, understand what feelings the situation evokes in them, and imagine what that situation would feel like for someone else (Yee & Bailenson, 2006). Through perspective taking in virtual reality users can attempt to empathize with others in the present social situation (Chambers & Davis, 2012). Empathy in a virtual environment can translate to empathy in real-life situations (Chambers & Davis, 2012).

Virtual reality technology can be used to evaluate the perception and empathy bystanders have toward victims of bullying when a bullying situation is present. This research will be valuable in understanding how to create more effective anti-bullying campaigns, particularly in the strategy of peer empathy. Paiva, Dias, Sobral, Aylett, Woods et al. (2005) compared student, teacher, and expert empathetic feelings towards those being bullied in a virtual reality simulation of a classroom bullying situation (Paiva, Dias, Dobral, Aylett, Woods, et al., 2005) The

researchers found that children reported more cognitive empathy and feelings of sorry for others than experts and teachers (Paiva et al., 2005).

Previous research has suggested that virtual reality may be helpful in combating bullying through behavior change. Muscott and Gifford (1994) recommended using virtual reality to model complicated social situations such as bullying, to help children develop prosocial skills. Sapouna, Wolke, Vannini, Watson, Woods, et al. (2010) studied bullying victimization and intervention behavior using an immersive simulation called FearNot, and found that it had significant short term effects on children for escaping victimization and preventing victimization. Virtual reality has known uses in helping promote prosocial skills, particularly to treat social phobias and other psychological disorders (Tettegah, Taylor, Whang, Meistninkas, & Chamot, 2006).

Prior research on bystander interventions in violent bullying situations using virtual reality technology showed that virtual reality may be an effective tool for encouraging bystander intervention, especially when taking advantage of the medium's ability to customize experiences to users' existing social groups (Slater, Rovira, Southern, Swapp, Zhang, Campbell & Levine, 2013). Slater, and colleagues (2013) measured intervention behaviors of participants during a virtual reality simulation in which a bullying victim was shown as either an in-group member or an out-group member compared to the participants' social group. The study found that participants engaged in more bystander intervention behaviors during the simulation when the victim was a member of their in-group (Slater et al., 2013).

The present study used the concept of in-groups and out-groups as conceptualized in the framework of social identity theory to compare the effectiveness of portraying a bullying bystander scenario in customized and non-customized virtual reality simulations or a video,

measuring users' empathy, attitude, anticipated behavior, and presence in bullying situations as self-reported outcome measures. A one-factor, three-condition laboratory experiment compared responses to a video condition from an existing media campaign, along with two original virtual reality simulations based on the content of the video campaign, to measure effects on the users who were placed in the perspective of a bystander in a bullying situation. The virtual reality technology used was a simulation developed with the Unity software package and displayed on a developer kit prototype of the Oculus Rift headset, which is scheduled for commercial release in January 2016 (Moynihan, 2015). In addition, a follow-up qualitative study drew feedback from focus groups to further explain the findings of the main experiment. With the upcoming commercial release of the Oculus Rift comes the opportunity for schools and homes to use this affordable technology in bullying prevention campaigns. This study explores the extent to which such virtual reality technology may represent a useful avenue for bullying prevention compared to video, a media format already used extensively in anti-bullying campaigns.

LITERATURE REVIEW

Bullying

Definition of Bullying

Bullying is a form of aggressive behavior, conducted by an individual or group, which involves attacking, humiliating, and/or excluding another individual (Salmivalli, 2009). Olweus (1993) stated that bullying is comprised of three components: enforcing harm, repetition, and an imbalance of power. Bullying behaviors toward a victim can be in the form of physical, verbal or social harm. Bullies have some form of power over victims, whether it is physical, psychological, or social, and they use that power to engage in harmful behavior toward a victim

(Oh & Hazler, 2009). Bullying is frequently a group process. As bullying can be a group process, bullying commonly occurs in large-group environments. Salmivalli (2009) studied bullying behavior and its effects in various group environments including school, workplace, and prison. Salmivalli (2009) found that if bullies are seeking status by bullying others, then the best intervention strategy is to intervene during adolescence. Also, Salmivalli (2009) concluded that these types of bullies are most likely to victimize others in a public place, such as at school.

Prevalence in Schools

Peer bullying is a prevalent problem for students in school settings beginning as early on as elementary school and occurring as late in education as college. A 2010-2011 School Crime Supplement study from the National Center for Education Statistics and Bureau of Justice Statistics found that 28 percent of students in grades 6-12 experienced bullying (National Center for Education Statistics). Another study found that as many as 30 percent of students faced bullying either as a victim or as a bully (Frey, Edstrom, & Hirschstein, 2009). School bullying is a problem recognized worldwide, and has many negative consequences on all parties involved in bullying (Espelage & Swearer, 2003).

Negative Effects

Bullying leads to negative effects on all of those present in a bullying situation including bullies, victims, and bystanders. Prior research studies discovered that those who were involved in bullying behavior, such as bullies, victims, and bystanders, are more likely to have anger issues and misconduct in school (Bosworth, Espelage, & Simon, 1999). Additionally, studies found connections between those present in bullying situations and criminal behavior (Olweus, 2002) and suicidal thoughts (Kaltiala-Heino, Rimpela, Marttunen, Rimpela, & Rantanen, 1999). In addition, studies found that negative effects such as physical health concerns (Rigby & Slee,

1999), low self-esteem (Rigby & Slee, 1993), depression (Sweeting, Young, West, & Der, 2006), anxiety (Craig, 1998), and poor school attendance (Kochenderfer & Ladd, 1996) are associated with behaviors of bullying victims. Aside from risks bullying poses to both bullies and their victims, research found that witnessing bullying situations has a negative influence on the bystanders present (Nishina & Juvonen, 2005). Bystanders reported feeling more uncomfortable in bullying situations compared to bullies and noted experiencing feelings of anxiety and insecurity (Stevens et al., 2000). After witnessing bullying situations, studies found the anxiety experienced by bystanders was associated with aggressive retaliation behavior and fears of being bullied (Rigby & Slee, 1993). With such a widespread range of negative consequences resulting from bullying, many schools worldwide attempt to reduce the prevalence of bullying by implementing bullying prevention programs (Polanin et al., 2012).

Prevention Programs

Since the early 1990's, there has been a rise in bullying prevention programs (Ferguson, San Miguel, Kiburn, & Sanchez, 2007; Ryan & Smith, 2009; Ttofi & Farrington, 2009, 2011). Researchers, teachers, and school administers alike have all used a variety of designs and theories to develop programs and attempt to decrease acts of school bullying (Astor, Meyer, Benbenishty, Marachi, & Rosemond, 2005). Several meta-analyses have been conducted to analyze bullying prevention programs of both qualitative (Ryan & Smith, 2009) and quantitative (Ferguson et al., 2007; Ttofi & Farrington, 2009, 2011; Merrell, Gueldner, Ross, & Isava, 2008; Smith, Schneider, Smith, & Ananiadou, 2004) types. Ryan and Smith (2009) reviewed 31 studies on bullying prevention programs and concluded that much work remains to further develop and evaluate bullying prevention programs. A meta-analysis of 53 bullying prevention programs conducted by Ttofi and Farrington (2009) found that bullying prevention programs were

effective and decreased bullying by 20-23% and victimization by 17-20%. Another meta-analysis of anti-bullying programs by Merrell et al. (2008) deduced that bullying prevention programs are more effective at influencing knowledge, attitudes, and self-perceptions, rather than bullying behavior. One strategy used in bullying prevention programs is to engage bystanders in taking action in bullying situations (Polanin et al., 2012).

Bullying and Bystanders

Bystanders are studied in a variety of contexts, ranging from reacting to emergency situations to witnessing violence (Oh & Hazler, 2009). Many diverse definitions on what constitutes a bystander exist, depending on the level of involvement individuals believe a bystander has in a circumstance. Barnett (1999) summarized various definitions and concluded that bystanders are present in a situation without being considered a spectator or observer. However, Twemlow, Fonagy, and Sacco (2004) argue that bystanders are not just observers on a situation; they have an active role and are involved participants. Included in the more active definition of bystanders is that bystanders have roles of support, opposition, or indifference to offenders (Oh & Hazler, 2009).

Students and peers who witness bullying are considered bystanders of bullying, and therefore are an important audience to access for bullying prevention programs. O'Connell, Pepler, and Craig (1999) found that bystanders are present in more than 80 percent of bullying situations. Bystanders of bullying situations can take on many different roles including intervening, encouraging, or watching passively (Cowie, 2000; Smith, Twemlow, & Hoover, 1998). Other bystander roles include acting as a reinforcer, assistant, defender, or outsider in a bullying situation (Salmivalli, 1999). A reinforcer bystander provides positive encouragement to bullies, showing support for bullying. An assistant bystander joins in on the bullying behavior,

often by holding or catching the victim. The most common type of bystander, an outsider, continues to be uninvolved in the bullying situation. A defender bystander supports the victim and rejects bullying behavior (Oh & Hazler, 2009). While a bystander may act individually, multiple bystanders of a situation may take on any of these roles together or separately. As bystanders have several options for taking action in a bullying situation, it is necessary to understand what influences their behavior to partake in one role over another. Unfortunately, most bystanders are less likely to act as a defender, because they are afraid of revenge and uncertain of the situation outcome (Oh & Hazler, 2009). Hazler (1996) found three reasons why bystanders do not intervene in a situation: they do not know what to do, they fear retaliation, and they think they could make the situation worse. Fully understanding what influences bystanders to take on certain roles in a bullying situation can provide ways to improve bullying prevention programs.

Bystander-Based Bullying Prevention Research

Research has produced mixed findings regarding the most successful ways to promote effective bystander intervention behaviors (Polanin et al., 2012). Prior research on bystander intervention in bullying prevention programs has examined bystander reactions and mediums for intervention. Studies on bystander reactions have also analyzed both personal and situational variables of influence. Several studies found that the gender of bystanders affected their reaction roles. The research found that males were more likely to act in the reinforcer and assistant roles, whereas females were more likely to act in the defender and outsider roles (O'Connell et al., 1999; Salmivalli, Lagerspetz, Bjöorkqvist, Österman, and Kaukiainen, 1996). Age was also a factor in bystander participation, as studies showed older bystanders were less likely to have a reaction in bystander situations (Menesini, Eslea, Smith, Grenta, Giannetti, Fonzi, and Costabile,

1997; Rigby and Slee, 1993). Another personal variable studied was social status, which found that the majority of victim defenders were of a high social status (Salmivalli et al., 1996). Studies on situation variables analyzed different types of aggression and its effects on bystander reactions. The findings revealed that when direct relational, indirect verbal, and indirect relational aggression types were used in a bullying situation, bystanders were more likely to support the bully. When direct physical and direct verbal aggression were used, bystanders were less likely to support the bully (Tapper & Boulton, 2005).

Along with personal variables, studies have also examined the relationships bystanders have to the bully or victim. Tisak and Tisak (1996) studied early adolescent students and found that bystanders were more likely to confront the bully when the bully was a good friend rather than an acquaintance. Chauz (2005) studied relationships between bystanders and bullies and victims using college participants, and found that bystanders were more likely to support one party when they had a closer relationship to a main participant on one side. These studies show that a relationship to the bullies or victims affects bystander intervention. However, the research shows a need for further understanding on how relationships and the group process influence bystander decisions.

Various mediums of intervention have been studied in order to discover the most effective educational methods for teaching students about bystander behavior. Mediums studied include classroom conflict (Merrell, 2004), videotaped reenactments and media (McLaughlin, 2009; Schumacher, 2007), and customized computer-adaptive programs that provide feedback on effective bystander behavior (Evers, Prochaska, Van Marter, Johnson, & Prochaska, 2007). Studies on peer-group intervention found that the programs tried to encourage bystander intervention (Vlachou, Andreou, & Didaskalou, 2008; Frey et al., 2009; Stevens, Oost, &

Bourdeaudhuij, 2000) and empathy for the victim (Gini, Albiero, Benelli, & Altoe, 2007; Nickerson, Mele, & Princiotta, 2008).

A meta-analysis study of school-based bullying prevention programs conducted by Polanin et al. (2012) revealed the need to create awareness of participant roles of bystanders, urge active behavior, and develop more opportunities for bystanders to engage in role-play and practice bystander intervention behavior in real life situations. The meta-analysis also found that bullying prevention programs could be effective at fostering helpful bystander intervention behavior in programs that focus on bystander attitudes and behaviors. Polanin et al. (2012) argued that prevention programs need to do more than just define intervention strategies, like walking away, seeking help or intervening. The researchers suggested future research in developing programs and measuring bystander variables. In addition, the study called for future research on the effects of bystander behavior on bullying. Lastly, due to inconclusive findings on empathy effects, the study called for future research on the effects of bystander empathy on prevention programs.

Virtual Reality as a Medium for Social Influence

Defining Virtual Reality

Virtual reality has often been explored as a media form for research and applications dealing with its potential for social influence (Steuer, 1992). Virtual reality can be defined as both a form of technological equipment, and a medium. Popular definitions of virtual reality involve using a technological system, which most often includes computer software with animation, a head-mounted display, and a set of wired clothing for tracking (Steuer, 1992). However, virtual reality can also be defined in terms of human experience (Steuer, 1992). For instance, Blascovich, Loomis, Beall, Swinth, Hoyt, and Bailenson (2002) defined virtual reality

as, "synthetic sensory information that leads to perceptions of environments and their contents as if they were not synthetic" (p. 105). Crucial to understanding virtual reality as a human experience in addition to technology is the idea of presence.

Psychological Responses to Virtual Reality

   Presence. Presence, also referred to as telepresence, is an important concept in understanding the human experience within virtual reality (Steuer, 1992). The concept of presence can be thought of as one's surroundings, not just in the physical environment, but also by surroundings facilitated by metal processes (Gibson, 1979). Steuer (1992) defined presence as "the extent to which one feels present in the mediated environment, rather than in the immediate physical environment" (p. 76). Comparably, Witmer and Singer (1998) describe presence as, "the subjective experience of being in one place or environment, even when one is physically situated in another" (p. 225). Presence also encompasses an individual's perception that the experience is real and has degrees of sensory richness, also known as vividness (Lee 2004; Steuer, 1992). Riva, Gaggioli, and Villani (2007) found that presence can evoke affective responses. They also argued that virtual reality could be tailored to create specified emotions in individuals. Studies on therapeutic uses of virtual reality have observed that through presence, people can experience simulations of their phobias or stressors and learn to overcome them. Hodges, Kooper, Meyer, Rothbaum, Opdyke, de Graaff, Williford, and North (1995) studied the therapeutic use of virtual reality in helping to overcome participants' fears of heights. Participants in that study were exposed to their fear in various forms, such as an elevator simulation, and reported high levels of presence. The study found that over time, participants' fear decreased as they experienced the simulations (Hodgeset al., 1995). Similar studies on social anxiety (Pertaub, Slater, & Barker, 2002), paranoia (Freeman, Slater, Bebbington, Garety,

Kulpers, Fowler, & Vinayagamoorthy, 2003) post-traumatic stress disorder (Rothbaum, Hodges, Alarcon, Ready, Shahar, Graap, & Baltzell, 1995), and pain distraction (Hoffman, Patterson, & Carrougher, 2000) showed that presence in the virtual reality environment is an important experience in therapy interventions. By using the notion of presence, Steuer (1992) defines virtual reality as "a real or simulated environment in which a perceiver experiences telepresence" (p. 77). The concept of presence may be a key element of how virtual reality can evoke emotions and physical feelings of being in another environment, making it an alternative medium of communication and an effective tool for creating simulations that closely correspond with real-life experiences (Steuer, 1992).

Virtual reality is capable of inducing more presence than traditional forms of media (Tamborini, Eastin, Skalski, Lachlan, Fediuk, & Brady, 2004). Tamborini and colleagues (2004) stated that virtual reality video games and standard video games can elict more presence than television and other forms of media. Tamborini and colleagues studied presence effects across different media environments related to video games. In a comparison of three environments, a virtual reality video game, a standard video game, and a passive video game (wherein a participant watched but did not play a video game), both the virtual reality and standard video game conditions produced higher reported levels of presence from participants than the passive condition (Tamborini et al., 2004).

Perspective taking. Research in perspective taking explores cues, processes, and outcomes involved in people imagining themselves in the shoes of another person. Prior research on this subject found that perspective taking increases thoughts about the overlap between the self and others (Yee & Bailenson, 2006). For example, Davis and colleagues (Davis, Conklin, Smith & Luce, 1996) found that participants engaging in perspective taking had more self-related

and positive associations to the target others in the situation, creating a merging of the self and others. Ames (2004) suggested a similarity-contingency model that heuristics of projection and stereotyping allow for internalizing the states of others. Virtual reality offers a superior alternative to any other forms of perspective-taking methodology, by allowing users to be present in the perspective of another. Yee and Bailenson (2006) argued that virtual reality perspective-taking simulations are more effective than other perspective-taking techniques because they place users in the body of another person, rather than just asking them to imagine being in another's scenario. The researchers found that perspective taking in immersive virtual reality technology is beneficial in reducing negative stereotypes (Yee & Bailenson, 2006). As previous research has shown, there is a need for bystanders to practice bystander-bullying situations, in order to learn how to respond to a given situation (Ferguson et al., 2007). The use of virtual reality in this study allows for users to take the perspective of a bystander in a bullying situation, and gain the practice needed for an effective prevention program. Perspective taking also leads to having more empathy for others.

Empathy. Perspective taking allows for individuals to experience a different perception of social situations, understand what feelings the situation evokes in them, and imagine what that situation would feel like for someone else. Through perspective taking in immersive virtual reality, users can attempt to empathize with others in the present social situation. Empathy in the virtual world can translate to empathy in real-life situations. Prior research suggests the need for a convenient way for people to engage in perspective taking, because it leads to greater empathetic feelings for another. For instance, Chambers and Davis (2012) argue that the more easily people can imagine themselves in the place of others, the more empathy they will have for others. Virtual reality offers this ease of perspective taking, and can therefore lead to more

empathy. Research in empathy and virtual reality has found that virtual reality is an effective tool to evoke empathy for those who are stigmatized. In a study investigating effects of a virtual reality simulation of schizophrenia on perceptions of persons with schizophrenia, Kalyanaraman and colleagues (2010) found that a virtual reality simulation created more positive perceptions and evoked greater empathy for those with schizophrenia compared to a control condition or a paper-and-pencil narrative thought-listing exercise alone, with a combination of the virtual reality presentation and the paper-and-pencil exercise even more effective in influencing those outcomes. These findings suggest that virtual reality can be effective in creating more empathy for others, especially for stigmatized groups. Virtual reality can be useful in this empathy creation for stigmatized groups such as victims of bullying. In addition to the finding from Kalyanaraman, and colleagues (2010) that virtual reality can increase empathy for persons with schizophrenia, Torres, Cangas, Garcia, Langer and Zarate (2012) found that participants using a virtual reality 3-D simulation of school and home scenarios and presented with a list of possible response options to the various scenarios selected fewer responses involving risky behaviors such as drug use and bullying compared to participants using a parallel paper and pencil essay form.

Prosocial behavior change. Along with the customizable and immersive properties of virtual reality, virtual reality can also help create positive social behavior change through simulation interaction. For instance, Parsons and Mitchell (2002) found that the ability to play roles and practice behavior in simulations has potential to promote problem solving. Rothbuam and Hodges (1999) verified the value of using virtual reality for anxiety disorders including fear of heights, flying and post-traumatic stress disorder. Klinger, Bouchard, Legeron, Roy, Lauer, Chemin, and Nuges (2005) found that virtual reality can be used to treat social phobias.

Similarly, research conducted by Botella, Villa, Garcia-Palacios, Banos, and Perpina (2004) showed that virtual reality can help with panic disorders. Additionally, Vincelle, Anolli, Bouchard, Wiederhold, Zurloni and Riva (2003) found uses for virtual reality in helping those who suffer from agoraphobia. Previous research has shown that virtual reality simulations are capable of producing prosocial behaviors. More specific to the topic of bullying, Sapouna, Wolke, Vannini, Watson, Woods, Schneider, Enz, Hall, Paiva, Andre, Dautenhahn, and Aylett (2010) conducted a study using an immersive virtual learning intervention called FearNot, designed specifically to help children who are likely to encounter bullying develop victimization coping skills and learn how to escape and prevent bullying situations. The study included self-reported pre-study and post-study measures of victimization behavior to explore effects of the simulation. Participants in the study engaged in the simulation, which featured a bullying situation in a classroom setting and a chance for participants to give advice to the victim after a bullying encounter. Findings indicated that the virtual learning intervention had short-term effects on children's ability to avoid being bullied and prevent the bullying of others (Sapouna et al., 2010).

While these previous studies have tended to compare effects of virtual reality simulations and related immersive technologies on empathy and related prosocial responses to effects of a paper-and-pencil narrative exercise or a control condition, there is limited research comparing effects of virtual reality on such responses compared to effects of other potentially less immersive electronic media such as video. However, based on the potential for virtual reality to elicit enhanced responses such as presence and the VR medium's demonstrated potential for effects on empathy and other social responses, we predict:

H1a: Participants using either a customized or non-customized VR simulation of a bullying bystander experience will report more empathy toward the bullying victim than participants viewing a video of a bullying bystander experience.

H1b: Participants using either a customized or non-customized VR simulation of a bullying bystander experience will report more anti-bullying attitudes than participants viewing a video of a bullying bystander experience.

H1c: Participants using either a customized or non-customized VR simulation of a bullying bystander experience will report more intentions to participate in bystander intervention behaviors than participants viewing a video of a bullying bystander experience.

Customization in Virtual Reality

In addition to all of the immersive properties of virtual environments, virtual reality also allows for the unique capability of customization compared to many other media presentation formats. The concept of customization is founded on the principle of tailoring messages to an aspect of the self (Petty, Barden & Wheeler, 2002). Therefore, customization is often linked with distinctiveness and identity (Kalyanaraman & Sundar, 2006). Petty, Wheeler, and Bizer (2000) argued that when messages include some aspect of the self, customized messages have persuasive effects. In fact, Petty, Barden, and Wheeler (2002) summarized that in many experiments regarding customized messages, individuals favor objects or experiences that relate to an aspect of their self, as opposed to those that do not involve their self. Customization in virtual reality can exist on a larger group scale or on an individual level.

Customization in virtual reality can involve using technology to create uniquely tailored messages for individuals (Fox & Bailenson, 2009). Several studies tested the notion of virtual self-modeling, to see if virtual reality simulations can change real world behaviors. Fox and

Bailenson (2009) studied virtual self-modeling by using virtual representations of participants in simulations to show effects of exercise behaviors, finding that virtual self-modeling may influence real life exercise behavior change (Fox & Bailenson, 2009). A similar study by Fox, Bailenson, and Binny (2009) tested the concept of virtual imitation, participants' willingness to model an avatar's behavior, to see whether a customized virtual simulation involving diet could change real world health behaviors. The study found that using the virtual self had influence on participants' real world behavior (Fox, Bailenson, & Binny, 2009).

In addition to individual-level customization, which can be logistically challenging, virtual reality also allows for the customization of simulations at a group level to reflect aspects of individuals' social identity. The idea of social identity was first conceptualized by Tajfel (1972) to understand how people categorize themselves within society (Tajfel, 1972). Social identity theory states that people classify themselves and others into numerous social categories, such as organizational membership, religious groups, and age groups (Tajfel & Turner, 1985). Social identity theory involves a system of relational meaning coming from social categories of various in-groups and out-groups (Kessler, 2013). Ashforth and Mael (1989) argue that social classification has two functions: so individuals can methodically define others and so they can define themselves in the environment. Social identity theory involves the concept of two identities within an individual, personal identity and social identity (Ashforth & Mael, 1989). How people define themselves tends to be relative and comparative to others (Tajfel & Turner, 1985).

Social identification is often referred to as group identification, and they can be seen as interchangeable concepts. When individuals identify with a group, they see themselves as intertwined within a group, as experiencing the ups and downs a group faces, and as in a

reciprocal relationship with the group (Ashforth & Mael, 1989). Individuals categorize themselves with a social group often based on values, prestige, out-group awareness, and factors such as sameness, shared goals, and so on. Social group belonging allows for uncertainty reduction and validation for an individual in the in-group. In-groups encompass prototypical behaviors that attempt to differentiate them from out-groups (Kessler, 2013). Also, in-groups focus on positively distinguishing themselves from other groups (Hogg, 2001). Attitudes toward out-groups vary depending on the environment of the in-group (Brewer, 1999). In-groups view out-groups in numerous ways, ranging from hostile, to indifferent, to sympathetic (Brewer, 1999). Identification with an in-group can result in individuals' increased contribution to a group and help to its members. Group identification can also lead to in-group favoritism and bias, a concept often researched in business management (Kessler, 2013).

Social identity theory and virtual reality. Slater et al. (2013) used an immersive virtual reality situation to study bystander responses in a violent situation where the victim was an in-group or out-group member. The virtual reality simulations involved comparing bystander intervention effectiveness between a victim of a violent crime who was either a member of an in-group of participants or not. The in-groups and out-groups were identified by customizing the victim's shirt in the simulation to either represent an in-group or not. Specifically, the experiment conducted by Slater et al. (2013) studied bystander intervention variations in violent incidents in two simulation conditions. They recruited male fans of the Arsenal Football Club in England to participate in the virtual reality simulation. The simulation setting was a bar, in which the participant engaged in a conversation about football with a virtual human (the eventual victim). After conversing for some time, another virtual human walked over to the first virtual human, argued with him, and eventually physically harmed the other virtual human by pushing him

against a wall. The bystander of the violent bullying situation, the participant, had two

intervention options of verbal intervention and physical intervention. The victim was also

identified as an in-group member, or an out-group member to the participant. The study used one

customized condition in the simulation, in which the victim wore an Arsenal Football Club t-

shirt. In the other simulation, the study used an out-group (or arguably a "non in-group," as the

condition did not overtly place the victim in an identified out-group) in which the victim wore a

plain t-shirt. The customization of virtual reality allowed researchers to examine the role of

social identification in bystander interventions. The study found that participants were more

likely to intervene, verbally or physically, in the violent bullying situation during the simulation

when the victim was an in-group member than when the victim was an out-group member.

While the Slater et al. (2013) study only compared effects of the in-group and out-group

conditions and did not compare effects of the simulations to other media formats, their results

related to group-level customization lead us to make the following predictions regarding effects

of a customized simulation compared to a non-customized simulation and a video condition:

H2a: Participants using a customized VR simulation of a bullying bystander experience

will report more empathy toward the bullying victim than participants using a non-customized

VR simulation and participants viewing a video of a bullying bystander experience.

H2b: Participants using a customized VR simulation of a bullying bystander experience

will report more anti-bullying attitudes than participants using a non-customized VR simulation

and participants viewing a video of a bullying bystander experience.

H2c: Participants using a customized VR simulation of a bullying bystander experience

will report more intentions to participate in bystander intervention behaviors than participants

using a non-customized VR simulation and participants viewing a video of a bullying bystander experience.

MAIN EXPERIMENT

Given that prior research has suggested that virtual reality may be an effective medium for evoking behavioral response, perspective taking and empathy, including in bullying scenarios, this study explores the effectiveness of virtual reality in a bullying bystander scenario with a focus on comparing both customized and non-customized virtual reality simulations to a video campaign depicting a similar bystander scenario to explore whether virtual reality campaigns may be uniquely effective compared to existing video campaigns.

Methods

All participants (N=78) in a one-factor, three-condition laboratory experiment were randomly assigned to one of three conditions: a customized virtual reality condition, a non-customized virtual reality condition, or a video condition. Participants first filled out a series of pre-experiment questionnaire items, then took part in the bystander scenario using virtual reality or video as per their assigned condition, and concluded their participation by filling out questionnaires containing the study's dependent measures.

Participants

Initially, a total of 80 participants for the experiment were recruited from communication courses at Virginia Tech in exchange for course credit using a department-wide research participation system. One participant was unable to complete the study session due to a malfunction with the virtual reality simulation. A researcher mistakenly gave a second participant two pre-exposure questionnaires, as opposed to a pre-exposure and post-exposure questionnaire. These two participants were eliminated from the sample prior to analyses, leaving

a final sample of 78 participants for analyses. The 78 final participants' mean age was 19.74 (*SD* = 1.33) (Range = 18-26) and their gender makeup was 67.95% (*n* = 53) female. The participants' year in school was 29.87% freshmen (*n* = 23), 41.56% (*n* = 32) sophomores, 20.78% juniors (*n* = 16), and 7.72% seniors (*n* = 6). All study procedures were approved in advance by the Virginia Tech Institutional Review Board.

Stimulus Materials and Independent Variable Manipulation

The stimulus materials for this study included a video from the "Be More than a Bystander" campaign, developed by the Ad Council and the US Department of Health and Human Services, and two original virtual reality simulations, which were based off of the "Be More than a Bystander" campaign video (Effects of Bullying, n.d.). The video, published in 2012, titled "Bullying Prevention-Lockers," is a 30 second video in which a bystander witnesses one female student being bullied by two other female students. The bullying takes place in the school hallway near the lockers in-between classes. The victim is both verbally and physically bullied throughout the video. The video condition was presented using a computer LCD monitor and computer speakers. The virtual reality simulations were created to closely resemble the general content and message of this video, but using computer-generated three-dimensional graphics in a virtual reality presentation. The simulations were created using Unity software package and displayed using a developer kit version of an Oculus Rift virtual reality headset. The Oculus Rift headset is a head-mounted display complete with goggles that allow for a 360° view of the virtual world. The Oculus Rift presents a 3D stereoscopic view with parallel views of images for both eyes, which is how people perceive images in the real world (Oculus Rift, n.d.). The users also wore over-the-ear headphones to provide audio for the simulation. The headset was connected to a computer, which ran the created simulation through a game development

program called Unity. The simulations pictured a school setting, and two female students

bullying another female student, and used the same audio from the video. The simulations also

included the same end title screen shown in the video, directing viewers to a website about more

information on bystander intervention.

        Customized VR condition. For the customized VR condition, the study used a virtual

reality simulation developed to make the user feel immersed in a bullying situation as a

bystander witnessing bullying (Figure 1). The simulation placed the user in the perspective of a

bystander to a bullying scenario, where two students are bullying, both verbally and physically, a

third student in a school hallway outside of the lockers. The simulation provided a group-level

customization cue by showing the bullying victim wearing a Virginia Tech logo on her shirt. The

user was able to look around in the simulations, but did not have the capability to independently

move around in the virtual world or interact with the bullies and/or the victim.

Figure 1. Images from the Customized VR Condition

Teach your kids how to
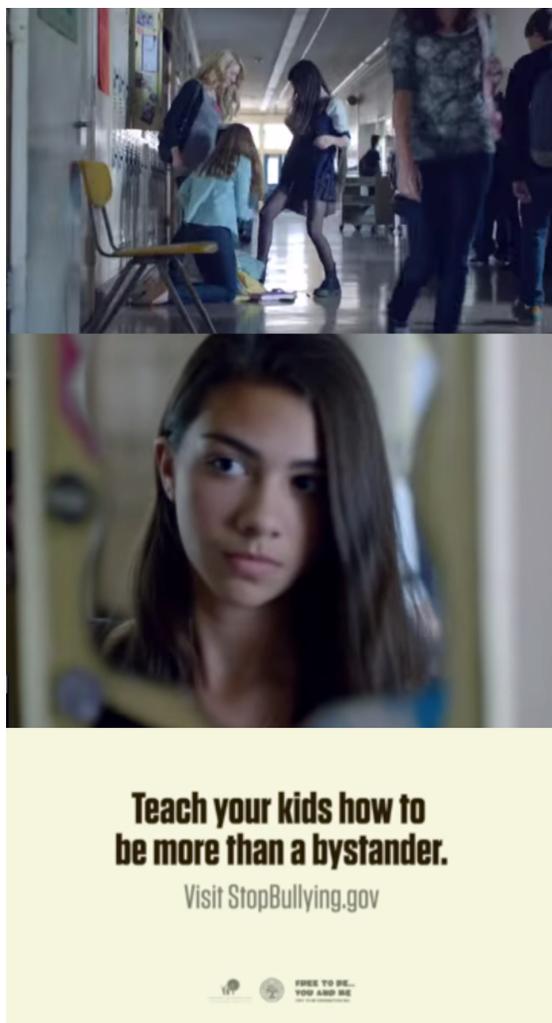be more than a bystander.
Visit StopBullying.gov

Non-customized VR condition. Participants in the non-customized condition used a virtual reality simulation that was exactly the same as in customized condition, except that there was no customization component of the Virginia Tech logo and colors on the bullying victim's clothing (Figure 2). In the non-customized condition, the victim wore clothing with no logos.

Figure 2. Images from the Non-customized VR Condition

Video condition. For the video condition, participants watched the "Bullying Prevention-Lockers" video from the Ad Council and the US Department of Health and Human Services' "Be More than a Bystander" campaign (Figure 3). The video was displayed on a desktop monitor for easy viewing. The video is included as a condition in the study for an external validity check of the simulation conditions' effectiveness against existing media campaign materials even though the exact video content of the video and VR simulations are not precisely matched (i.e., the video used filmed actors while the VR conditions used computer-generated models).

Figure 3. Images from the Video Condition

Descriptive and Individual Difference Measures

      Demographic measures. The pre-exposure questionnaire administered to participants

before the stimulus exposure (Appendix A) included single-item measures assessing age, sex,

and year in school.[1]

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[1] The pre-exposure questionnaire also included 120 measures from Swearer & Carey (2003) and Swearer, Turner, Givens, & Pollack (2008) related to individual experiences with being a victim of bullying, being a bystander of bullying, or being a bullying perpetrator. These measures were included to collect data regarding individual differences that may have served as possible moderators of any main effects of the stimulus conditions. Based on the study's results regarding the effects of the stimulus conditions on the study's outcome measures, and based on generally low prevalence reported for most of the individual difference measures related to specific types

Collective self-esteem/Importance to identity. To collect descriptive data assessing the extent to which participants identified with their school and social groups to inform the context of the customization manipulation, a measure of importance of identity to collective self esteem was adapted from Luhtanen and Crocker (1992). The measure used a 4--item index, to access the degree to which a participant agreed or disagreed (1= "Strongly disagree," 7= "Strongly agree") with a statement. Two 4-item versions of the scale were administered in the pre-exposure questionnaire: one assessing identification with the participants' school (Cronbach's Alpha = .81) and another assessing identification with participants' social groups more generally (Cronbach's Alpha = .83).

Pre-existing perceptions of school bullying as a problem. To provide context about participants' perceptions of the relevance of the simulation's subject matter to them, a one-item yes-or-no question in the pre-exposure questionnaire asked participants if bullying is a problem in their school. This measure was adapted from Swearer and Carey (2003) and Swearer, Turner, Givens, and Pollack (2008).

Pre-existing perceptions of schools' responsibility to address bullying. As another measure of participants' perceptions of the relevance of the simulations' subject matter to them, another one-item yes-or-no question in the pre-exposure questionnaire asked if participants if their school should worry about bullying. This measure was adapted from Swearer and Carey (2003) and Swearer, Turner, Givens, and Pollack (2008).

Dependent Measures

Empathy for the bullying victim in the scenario. The dependent measure of empathetic feelings for victims of bullying was adapted from Batson et al. (1997) and measured, using a 6-

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and contexts of bullying experiences, these data were not analyzed further, but the items can be seen in the pre-exposure questionnaire in Appendix A.

item index, how closely a set of adjectives describes participants' emotions toward victims of
bullying (1= "Not at all," 7= "Extremely") This scale was administered in the post-exposure
questionnaire (Appendix B) (Cronbach's Alpha = .92).

Attitudes toward bullying victims. A measure of attitudes toward bullying victims was
adapted from Batson et al. (1997) and measured, using a 7-item index, attitudes towards bullies
and bullying victims (1= "Strongly disagree," 9= "Strongly agree") (1= "Not at all," 9= "Very
much") (1= "Not at all important," 9= "Extremely important") (1= "Extremely negative," 9=
"Extremely positive"). This scale was one of two scales used to measure attitudes toward
bystander intervention and administered in the post-exposure questionnaire (Cronbach's Alpha =
.77). A second measure of attitudes toward bullying was also used, adapted from Swearer and
Carey (2003) and Swearer, Turner, Givens, and Pollack (2008) and using a 14-item index
assessing attitudes toward bullying (1 = "Totally False," 5 = "Totally True). This scale was
administered in the post-exposure questionnaire (Cronbach's Alpha = .65).

Anticipated future bystander behavior. A measure of participants' future anticipated
bystander behavior in bullying situations was adapted from Banyard, Plante, and Moynihan
(2005) and measured, using a 16-item index, how likely a participant is to engage in a bystander
intervention behavior (1= "Unlikely," 5= "Very likely"). This scale was administered in the post-
exposure questionnaire (Cronbach's Alpha = .87).

Retrospective reports of bystander behavior. In addition to anticipated future
bystander behavior, a measure of participants' retrospective reports of past bystander behavior
was adapted from Banyard, Plante, and Moynihan (2005) as a possible measure of perceived
norms and social desirability associated with bystander intervention. The retrospective bystander
behavior measure used the same scales as the future bystander behavior index and measured,

using a 16-item index, prior engagement in a bystander intervention behavior. This scale was administered in the post-exposure questionnaire (Cronbach's Alpha = .78).

Perceptions of school bullying as a problem. A one-item yes-or-no question in the post-exposure questionnaire asked participants if bullying is a problem in their school (the same item used in the pre-exposure questionnaire). This measure was adapted from Swearer and Carey (2003) and Swearer, Turner, Givens, and Pollack (2008).

Perceptions of schools' responsibility to address bullying. A one-item yes-or-no question in the post-exposure questionnaire asked participants if their school should worry about bullying (the same item used in the pre-exposure questionnaire). This measure was adapted from Swearer and Carey (2003) and Swearer, Turner, Givens, and Pollack (2008).

Other Outcome Measures

Presence. As a possible moderator or mediator of effects of the stimulus conditions on dependent measures, participants' reports of presence experienced in the conditions was measured in the post-exposure questionnaire using a 3-item scale adapted from Kalyanaraman and colleagues (2010) assessing participants' agreement of amount of presence within the simulation (1= "Strongly disagree," 7= "Strongly agree") and feeling of being "there" within the simulation (1= "There," 7= "Not there") (Cronbach's Alpha = .86).

Customization manipulation check. A one-item manipulation check question was developed to measure how often participants in the customized VR condition reported that the victim was wearing a Virginia Tech logo compared to the non-customized and video conditions. A single yes-or-no question asked whether the participant noticed the Virginia Tech logo or not. This scale was administered in the post-exposure questionnaire.

Procedure

The study was conducted in a laboratory setting where each participant took part in experiment sessions alone. First, participants completed an informed consent form, followed by the pre-exposure questionnaire. Next, the participants either watched the "Be More than a Bystander" video, or engaged in one of the two virtual reality conditions according to random assignment. For participants assigned to either of the virtual reality simulations, the researcher briefly explained how to use the virtual reality simulator, situated the headset and controls, and then the participant engaged in the simulation. After the simulation, the researcher helped to remove the equipment. For those participants assigned the video condition, the researcher told the participant they would be viewing a 30 second video, and then played the video on the computer monitor. After completing the video or virtual reality simulation, participants completed the post-exposure questionnaire. Finally, participants were debriefed, thanked, and dismissed.

Results

Descriptive Statistics

Participants' mean reported agreement on identifying with Virginia Tech group membership was 5.10 ($SD = 1.16$) on the 7-point scale, which a one-sample t test found to be significantly higher than the scale midpoint of 3.5, $t(77) = 12.15$, $p < .0001$. Participants' mean reported agreement on identifying with social group membership was 5.38 ($SD = 1.12$) on the 7-point scale, which a one-sample t test found to be significantly higher than the scale midpoint of 3.5, $t(77) = 14.75$, $p < .0001$. Before exposure to the stimulus, 19.48% ($n = 15$) of participants reported agreement that bullying was a problem in their school, and 5.13% ($n = 4$) reported that their school should worry about bullying.

Empathy for the bullying victim in the scenario. H1a predicted that participants in either VR condition (customized or non-customized) would have more empathy toward the bullying victim than participants in the video condition, while H2a predicted that participants in the customized VR condition would have more empathy toward the bullying victim than participants in both the non-customized VR condition and the video condition. A one-way analysis of variance (ANOVA) with media stimulus condition as the independent factor and empathy for the bullying victim in the scenario as the dependent variable found that the effect was significant, $F(2, 75) = 6.66, p = 0.0022$, but not in the hypothesized direction, with empathy scores higher for the video condition ($M = 5.47, SE = 2.42$) than for the non-customized VR condition ($M = 4.64, SE = 2.42$) and the customized VR condition ($M = 4.24, SE = 2.42$). Post-hoc comparisons using Tukey's HSD tests indicate that scores for the video condition were significantly higher than for the non-customized VR condition and the customized VR condition (ps < .05), while the difference between scores for the two VR conditions was not significant ($p = .48$). H1a and H2a are disconfirmed.

Attitudes toward bullying victims. H1b predicted that participants in either VR condition (customized or non-customized) would report more anti-bullying attitudes than participants in the video condition. H2b predicted that participants in a customized VR condition would report more anti-bullying attitudes than participants in a non-customized VR condition or a video condition. A one-way ANOVA with media stimulus condition as the independent factor and attitudes toward bullying victims as the dependent variable found that the effect was not significant, $F(2, 75) = 0.63, p = .54$. A one-way ANOVA with media stimulus condition as the independent factor and attitudes toward bullying as the dependent variable found that the effect was not significant, $F(2, 75) = 1.29, p = .28$. H1a and H1b are not supported.

Anticipated future bystander behavior. H1c predicted that participants in either VR condition (customized or non-customized) would report more intentions to participate in bystander intervention behaviors than participants in the video condition. H2c predicted that participants in a customized VR condition would report more intentions to participate in bystander intervention behaviors than participants in a non-customized VR condition or a video condition. A one-way ANOVA with media stimulus condition as the independent factor and anticipated future bystander behavior as the dependent variable found that the effect was not significant, $F(2, 75) = 0.05$, $p = .95$. H1c and H2c are not supported.

Retrospective reports of bystander behavior. A one-way ANOVA with media stimulus condition as the independent factor and prior retrospective reported bystander behavior as the dependent variable found that the effect was not significant, $F(2, 75) = 2.33$, $p = .10$.

Presence. A one-way ANOVA with media stimulus condition as the independent factor and presence as the dependent variable found that the effect was not significant, $F(2,75) = 0.47$, $p = .63$.

Perceptions of school bullying as a problem. A chi-square analysis with media stimulus condition as the independent factor and perceptions of school bullying as a problem as the dependent variable found that the effect was significant, $\chi^2 (2, N = 77) = 6.14$, $p = .047$. In the video condition, 34.62% ($n = 9$) of participants thought bullying was a problem in their schools, in the non-customized VR condition, 8.00% ($n = 2$) thought bullying was a problem, and in the customized VR condition, 15.38% ($n = 4$) thought bullying was a problem.

Perceptions of schools' responsibility to address bullying. A chi-square analysis with media stimulus condition as the independent factor and perceptions of schools' responsibility to

address bullying as the dependent variable found that the effect was not statistically significant, $\chi^2 (2, N = 78) = 4.48, p = .11$.

Manipulation check. A chi-square analysis with condition as the independent factor and reports of the presence of the school logo on the bullying victims' clothing in the scenario as the dependent variable found that the effect was significant, $\chi^2 (4, N = 78) = 6.52, p = .038$. In the video condition, 4.00% ($n = 1$) of participants reported that the victim was wearing the school's logo, in the non-customized VR condition, 25.00% ($n = 6$) reported that the victim was wearing the school's logo, and in the customized VR condition (the only condition in which the victim was actually wearing the school's logo), 26.92% ($n = 7$) reported that the victim was wearing the school's logo.

Discussion

The main experiment revealed several findings related to the effectiveness of the compared media stimulus conditions. While it was hypothesized that the VR simulations would produce more empathy in participants compared to the video, with the customized VR condition having the highest report of empathy, the study results did not support these predictions. In general, the non-customized and customized VR conditions were less effective than the video condition in eliciting empathy. There was a significant effect of media stimulus condition on empathy for the bullying victim in the scenario, with the video condition having the highest levels of participant reported empathy. This study also found that perceptions of bullying as a problem were higher in the video condition. However, this finding may have been a sporadic effect given the null findings regarding other attitude and behavior related measures and the total number of tests conducted in the experiment's analyses. Study findings also show that the customization manipulation used in the VR simulations may not have been effective. Even

though there was a significant effect of the media stimulus condition on the manipulation check item, the majority of participants did not correctly report seeing the school logo in the customized condition, and the difference in the number of participants reporting seeing the school logo between the two VR conditions (customized and non-customized) was only $n = 1$. With that said, it is possible that the customization manipulation may have still made the school identity salient to participants even though they did not recall seeing the logo given that such cues can affect thoughts, feelings, and behavior without participants being consciously aware of the cue (Bargh, Chen, & Burrows, 1996). Regardless of the case, customization did not seem to influence the outcome measures. In general, the main experiment's results suggest that a VR simulation (at least as operationalized here) is no more effective at encouraging bystander interventions in bullying situations than a video clip, and possibly less effective.

FOLLOW-UP STUDY: FOCUS GROUPS

Based on the null results of several hypotheses in the main experiment, and the significant finding of higher levels of empathy in the video condition compared to the VR conditions, a follow-up focus group study was conducted in order to better inform the results from the main experiment. The qualitative data gleaned from the follow-up focus group study provided insight into the interpretability and implications of the main experiment's results.

Methods

All participants ($N = 10$) in a focus group study viewed all three conditions from the main experiment: the customized VR condition, the non-customized VR condition, and the video condition. Participants in the follow-up study filled out demographic and individual differences measures (the same measures for these variables used in the main experiment's pre-exposure questionnaire) in a brief questionnaire to collect data about the study participants. Participants

were each exposed to all three media stimulus conditions used in the main experiment, then took part in a focus group discussion that involved responding to questions prompted by a moderator in a small-group environment.

Participants

A total of 10 participants for the experiment were recruited from communication courses at Virginia Tech in exchange for course credit using a department-wide research participation system. None of the participants recruited for the main experiment were recruited to participate in the focus group study. All study procedures were approved in advance by the Virginia Tech Institutional Review Board.

Procedure

Participants were recruited into one of two small focus group sessions; the first focus group session had four participants, and the second session had six participants. The same two moderators conducted both focus group sessions. First, participants gathered as a group in a conference room, completed an informed consent form, and filled out a preliminary questionnaire, which asked participants to provide demographic information about their age, sex, and year in school. Then, the moderators explained the logistics of the study session to the participants.

After the brief explanation, one moderator brought individuals to the laboratory to take part in all three media stimulus conditions, while the other remained in the conference room with the participants who either had not engaged in the conditions or had already completed exposure to the conditions. Participants were exposed to the media stimulus conditions individually and were escorted back to the conference room when they finished with the media stimulus conditions in the laboratory. All focus group participants watched the video condition first, then

engaged in the non-customized VR condition, and lastly experienced the customized VR condition. Before each condition, the moderator briefly explained the length and general content of the condition. The moderator also noted that the final VR condition would be almost exactly the same as the other VR condition, with subtle differences.

Once all of the participants completed their exposure to the stimulus conditions, the moderators prompted an open group discussion using a series of prompt questions from a moderator's guide (Appendix C) developed for the follow-up study based on the researchers' questions and speculation about results from the main experiment. Depending on the nature of the discussion, the moderators asked additional questions at times to seek more participant feedback on the experiment conditions. Participants were encouraged to speak freely about their experiences with the conditions, and about real-life bullying scenarios they have experienced. The moderators recorded the audio of the focus group discussions for data interpretation and transcription (Appendix D & E).

Question Prompts

The focus group moderators prepared a moderator's guide containing six question prompts to act as discussion prompts in the focus group sessions. The question prompts were based on the researchers' questions and speculation regarding the main experiment's results.

In order to understand which content and functional aspects of the conditions the participants found effective, as well as which components of the conditions evoked empathy in participants, the following question prompt was used by the moderators: "What worked well about the video/VR simulation? What about the video made you feel empathy for the victim and might influence your attitudes and behavior in the future when you may be a bystander during a bullying episode?"

To gain insight on which content and functional aspects of the conditions the participants did not find effective, as well as which components of the conditions did not induce empathetic feelings in the participants, the following question prompt was used by the moderators: "What did not work well about the video/VR simulation? What was ineffective in terms of making you empathetic for the victim and influencing your attitudes and behavior in the future when you may be a bystander during a bullying episode?"

In order to understand how to improve evoking empathetic feelings for victims and intended bystander intervention from participants in future study conditions, the following question prompt was used by the moderators: "What would you change about the video/VR simulation to make it more effective at making people feel empathy for the victim and encouraging bystanders to intervene in bullying episodes?"

To assess differences in perceptions of the characters in the video and simulation due to the differences in photorealism between the video and VR conditions, and the lack of presence recorded from the VR conditions, the following question prompt was used by the moderators to gain insight on the image effects: "The video had photorealistic video of real actors, while the VR simulation had computer-generated characters. Did that influence your responses? Would you have responded differently if the VR simulation used photorealistic video with real actors instead of computer-generated characters?"

As there were some limitations in the participant's behavioral independence in the VR conditions, the following question prompt was used by the moderators to understand how the programmed VR affected participant responses: "Both the video and VR simulation took you through a scenario without you controlling the character's actions. Would you have responded

differently if the VR simulation involved you making interactive choices and controlling your actions and movements in the simulation?"

To better understand the effectiveness of in-group and out-group customization in virtual reality, as well as gauge how noticeable the customization was in the condition, the following question prompt was used by the moderators: "Did the customization in the customized VR simulation affect your feelings toward the bullying victim? Why or why not?"

Thematic Analysis

In order to analyze the focus group transcriptions, the researcher conducted a thematic analysis. Thematic analysis is a method for systematically identifying perceptions of themes across a given data set (Braun & Clarke, 2012). Utilizing this method of analysis enables the researcher to locate commonalities in a topic, and then make sense of these shared meanings within the topic. First to begin the analysis process, the researcher transcribed the audio of the focus group sessions (Appendix D & Appendix E). After transcription, the researcher read and reread the focus group transcriptions to identify major ideas and themes in participant responses.

<div align="center">

Results

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Thematic analysis of the focus group transcriptions revealed several trends within participant responses. The following trends emerged from the focus group responses: the quality of the virtual reality graphics affected empathy, virtual reality simulations evoked some feelings of presence and empathy, the simulations needed additional bystanders and bystander intervention capabilities, the customization feature of the simulations was ineffective, and the bullying in the simulations needs to match bullying that occurs within the target audience group.

VR Graphical Quality

In discussions on how the video and virtual reality conditions did or did not evoke empathy, several participants felt that the graphical realism of the conditions affected their feelings of empathy toward the victim. A few participants felt that the characters in the virtual reality conditions were difficult to empathize with due to the non-photorealistic quality of the graphics. For instance, one participant said:

"…the simulation was kind of hard to empathize with anyone because you couldn't see like their faces, you couldn't see who was talking, almost like the faces didn't go with the body language." Another participant agreed and stated, "…their actions wouldn't match up with their words and their voices so it was kind of weird."

Similarly, in response to the question asking if participants would have felt differently if the virtual reality simulations had photorealistic images as opposed to computer-generated images, several participants felt that such a change would have affected their levels of empathy. Participants explained that the lack of photorealism and delay in voice and body language in the virtual reality agents made the virtual reality simulations less effective in producing empathetic feelings than the video condition. For instance, one participant replied:

"I think it would have made me more, a bit more, empathetic and felt like I was actually there…if the people were more real looking, because like when I watched the video…I really empathized with them."

A second participant said:

"…if the voices matched what they're doing then I think it would be a lot more effective because you are there, you're in that situation instead of just watching the video on the screen, so like I think that would be really effective."

Another participant responded:

"it obviously was animated and not real life, so you don't feel as much empathy I guess

for the victim, cause [sic] you know it's animated."

In general, participants found the simulation quality to hinder their ability to empathize with the

bullying victims compared to the video condition.

VR Influenced Presence and Empathy

Despite the numerous remarks that the quality of the simulation graphics negatively

impacted the simulation effectiveness, a few participants still thought the simulation was

effective in terms of evoking empathy and presence. For instance, a participant commented:

"…cause [sic] it was like a virtual reality thing, you could kind of put yourself in the

shoes of someone who would be witnessing it in real life, or it might bring up memories

…of past times when you witnessed it."

Likewise, another participant added:

"…in the VR it actually walked you past what's going on, I felt kind of bad." Contrary to

the main experiment results, there was some evidence in the focus groups that the virtual

reality simulations did produce empathetic feelings for the victim and feelings of

presence within the simulations.

Logistics of Bystander Scenario

Throughout discussion on what types of changes participants would like to see in the

virtual reality simulations in order to make them more effective, participants brought up

suggestions of adding more bystanders in the simulation, and including the capability to

intervene in the bulling scenario. Several participants noted that there was a lack of other

bystanders in the simulation. Participants felt as though additional onlookers in the bullying

scenario could increase the participant's intentions to intervene. For example, one participant

said, "…put a bystander in there, because I feel like there was actually no one even watching." A second participant stated, "…could add more people…that would've made it where you feel like you could've done something." In addition, participants felt as though watching a bystander intervene in the bullying situation, or having the capability to intervene would make the simulations more effective. For instance, a participant commented, "watching someone do something [intervene to stop the bullying] and having you be the bystander through the simulation that would help I think." Another participant remarked:

> "I think the message would be a lot more clear if…you could actually help because then you could be like oh I did something, look I'm in the eyes of someone who is doing this, I can do it too."

The same participant also felt as though by not having a bystander intervene, the simulation could potentially send a negative message about victim empathy and bystander intervention to participants. The participant said:

> "…it [the simulation] makes it look like it's ok to walk by, even though the ending of the ad [simulation] says anti-bullying, the whole ad [simulation] no one is doing anything, they just watch it and walk away…I feel like it kinda [sic] gave like a negative twist to the image by not doing anything. You should actually show someone doing something."

Overall, participants agreed that additional bystanders and bystander intervention would help the simulation be more effective in participants' intentions and empathy.

Ineffectiveness of Customization Cue

In regards to the customization condition, the majority of the participants, six out of ten, did not notice the customized feature of the Virginia Tech logo on the bullying victim. The

responses to the question of customization effectiveness were brief, and there were mixed feedback on customization's potential to be effective had participants noticed the logo.

Need for Tailoring of Simulation

Several participants mentioned that adjusting the simulation based on the intended target audience would produce more empathy. Participants commented that tailoring both the age of the virtual reality agents and the type of bullying depending on the target age group for the simulation would increase effectiveness.

First, participants suggested making the agents younger in the bullying situation, as this could evoke more empathy in both a college age group and a younger age group. For instance, one participant said, "I think that it's more relatable to make them [virtual reality agents] younger. I thought that would hit home more." Another participant added: "If you make them younger, like elementary students, like really young, I feel like the younger they are, the more it touches your heart."

In a discussion on what additional items could make the simulation more effective for college students, participants also suggested that if the simulation featured older agents, than the type of bullying would need to change. In particular, they felt that the type of bullying would be online and feature harassment and gossiping. For instance, a participant said, "It would be more online stuff, like, posting pictures that aren't very appealing…writing things on people's walls on Facebook or Yik Yak." Overall, participants felt that a few adjustments depending on target audience to the simulation could create more empathy for victims and make the simulation more relatable.

Discussion

Several trends emerged from the focus group discussions, suggesting why the video was more effective than the virtual reality conditions in terms of generating empathy, and how an anti-bullying simulation could be bettered for future research on bystander interventions in bullying situations. The focus group participants made clear that the quality of graphics in the simulation contributed to why the video was generally better at creating empathetic feelings in the participants. Participants also mentioned that the simulation did produce some feelings of presence and empathy, though those responses were never in a direct comparison to the video effectiveness, and they were only mentioned by some participants in discussion. Focus group participants also called for additional bystanders to be present in the simulation, as well as options for participants to intervene in the bullying situation within the simulation. The majority of the participants did not notice the customization component of the simulation, and participants were unsure whether or not that would make a difference in their level of empathy for the victim. Lastly, participants suggested changing aspects of the simulation such as character age or the type of bullying occurring in the simulation.

GENERAL DISCUSSION

Summary of Results

The present study was an attempt to investigate the effects of a VR simulation, customized or non-customized, in encouraging responses related to bystander intervention in bullying scenarios compared to a video. Findings from the main experiment suggest that the video condition was more effective in producing empathy than either the customized or non-customized VR conditions, and that the VR and video conditions were comparable in their effects on a range of measures related to attitudes and anticipated behavior related to bullying, save one possibly sporadic effect wherein participants in the video condition were more likely to

consider bullying a problem in their school than participants in the VR conditions. Focus group participants suggested that the VR simulations were less effective at producing empathy due to a lack of photorealism of the characters in the simulation. Participants from the focus group also commented that the inability to control the VR simulations and to intervene in the bullying scenario caused the simulations to be less effective than the video. Customization did not appear to influence measured responses to the VR simulation. Participants from the focus group noted that the customization cue, the Virginia Tech logo, was ineffective.

Theoretical and Practical Implications

While research has suggested virtual reality is more effective in producing empathetic feelings from participants than other forms of media such as video (Kalyanaraman et al., 2010), this study did not find stronger reported empathy for virtual reality simulations over a video condition. Findings revealed that the video condition produced more empathy in participants than either of the virtual reality conditions. Results indicate that the virtual reality simulations were less effective in evoking empathetic feelings toward a victim of bullying than the video condition.

The findings for empathy may be informed by the non-significant effect of the possible mediating variable of feelings of presence among participants. Presence is a key concept in research pertaining to the potential for virtual reality to induce emotional responses in participants (Riva et al., 2007; Steuer, 1992). It is possible that the VR simulation that is more effective at making participants feel "there" would not only elicit more reported feelings of presence, but also more empathy and other emotional responses. Slater et al. (2013) refer to this as 'plausibility,' and note three ways to enhance plausibility within an immersive virtual environment. These three ways include the level of which events occurring in the simulation

refer personally to the participant, the level of which the environment responds to participants' actions and the credibility of the scenario presented in the simulation in differences between in-groups and out-groups (Slater et al., 2013). Perhaps a simulation that more effectively incorporates these elements would increase presence among participants in a scenario such as the one used in the present study.

Another possible reason that the present study did not produce significant differences in feelings of presence across participants is the short duration of the simulation, which was designed to match the length of the video (which in turn was designed to be an appropriate length for a television advertisement). In their study comparing responses to a VR video game, a traditional video game, and a "passive" video game viewing experience, Tamborini et al. (2004) proposed that their study's three five-minute long sessions were not enough time for participants to experience presence in the VR game condition. The present study only allowed for participants to engage in the VR conditions for approximately one minute. The short time in the VR simulation could have contributed to the non-significant effect of presence, and in turn, empathy as well. It may be that an "apples-to-apples" comparison of VR and video stimuli using the same time duration is not feasible because video can be effective for brief message lasting less than a minute while the ideal duration of a VR experience is much longer.

Another explanation for the empathy results may be that when the graphics in the virtual reality scenario are computer generated, empathy for characters is not elicited to the same extent as with a photorealistic video despite the immersive nature of a VR scenario. According to the follow-up focus group study, participant responses indicated that the lack of photorealism in the simulations affected their feelings of empathy toward the bullying victim. Participants felt as though it was more difficult to empathize with the virtual reality bullying victim than the video

bullying victim because of the quality of the simulation graphics. Studies on computer generated images (CGI) and photorealism in virtual reality have found that the type of character render style can affect participants' perceptions of emotions with CGI characters. McDonnell, Bredit, and Bülthoff (2012) conducted a study on the effects of render style on perceptions of virtual humans using 13 different character render styles ranging from abstract to realistic. The study found that participants perceived the most abstract and most realistic render styles as the most appealing imagery. Participants found images ranging in the middle of this scale to be the most unappealing (McDonnell, Bredit, & Bülthoff, 2012). It may be that the CGI images used for the VR conditions in this study are more comparable to the more unappealing rendered characters in the middle of the scale in the McDonnell et al., study than to the more appealing characters at either end of their scale. Mäkäräinen, Kätsyri, and Takala (2013) studied emotional intensity and exaggerated facial expressions in CGI and photorealistic imagery in animated faces. Their study found that less realistic faces received low scores for emotional intensity. The McDonnell et al. (2012) and the Mäkäräinen et al. (2103) studies both acknowledge the importance of understanding the uncanny valley (Mori, 1970) when creating animated images. The uncanny valley refers to the phenomenon wherein a virtual character is animated to a point of human realism that is highly realistic in many ways, but still discernibly different from photorealistic, which viewers find to be creepy or unsettling. This effect is problematic when a virtual character is intended to be likeable (Mäkäräinen et al., 2013). In the present study, participants may have found virtual characters to be in the range of the uncanny valley, making it difficult to empathize with them.

Similarly, the focus group participants also commented that the lack of sync between audio and character movement in lips and other physical components contributed to having less

empathetic feelings for the victim. Slater et al. (2013) asked participants to describe technical factors that made them feel less present in the simulation. One of the technical factors mentioned that affected participants' presence was that characters' mouths were not synced with the sound (Slater et al., 2013). In the present study, the audio from the bullying video was used with CGI characters without any measures taken to match facial movements with the audio track, which could have reduced feelings of presence as well as participants' empathy for the bullying victim.

While it was predicted that participants using either of the VR simulations would report more anti-bullying attitudes and intentions to participate in bystander intervention behaviors than those viewing the video, no such differences were observed. Additionally, it was predicted that the customized VR simulation would produce more anti-bullying attitudes and intentions to participate in bystander intervention behaviors, but no such differences were observed. A possible explanation for these null effects may be that the VR simulations did not allow for independent interaction in bystander intervention behaviors within the simulations. Participants in the VR conditions were unable to direct themselves or intervene in the bullying situation throughout the simulations. Focus group participants commented that the VR simulation would have been more effective had they had the opportunity to intervene in some way to stop the bullying. In addition, they felt as though the scenario's automated movement of the user's point of view past the bullying situation was ineffective in encouraging intervention behavior. Participants would have preferred to be able to stop at the bullying situation rather than being portrayed as walking by without helping the victim. Slater et al. (2013) noted that their study on bystander intervention in a violent situation could have policy implications, in that it acts as an example of what a bystander should do in the situation. Slater et al. (2013) commented that in their simulation a bystander should not walk away; they should be encouraged to help the victim

of violence. They further noted that by showing a bystander take action to help a victim helps encourage bystander intervention. Slater et al. (2013) also proposed that participants in their study were more likely to intervene if the simulation was more interactive. In a study on what motivates video game players during a game, Ryan, Rigby, and Przybylski (2006) found that autonomy in a video game, conceptualized as the ability for a player to make choices and control actions in a game, increased players' game enjoyment and desire to play a video game in the future. Allowing participants in the present study to stop near the bullying situation and take action in the VR simulations could have increased anti-bullying attitudes and bystander behavior intentions among participants.

Another factor that could have influenced effects of the customized and non-customized VR conditions was distraction. In an immersive VR environment, there are many distractions that draw attention from specific content in the scenario. Witmer and Singer argued that distractions, such as isolation (a head mounted display), selective attention (the observer's willingness to focus on the simulation), and interface awareness (unnatural surroundings) can all negatively impact a viewer's ability to be present within a virtual environment (Witmer & Singer, 1998). The head mounted display, participants' ability to focus, and the virtual reality environment itself may all have served as distractions from the prosocial message in the VR simulations used in the present study. In comparison, the video condition did not provide as many external distractions for the viewer as the VR conditions.

Hypotheses predicting that the customized VR simulation would have greater effects on empathy, anti-bullying attitudes, and anti-bullying behavioral intentions compared to the non-customized condition were not supported. One explanation could be that the customization cue was not strong enough to influence participants. Although there may have been reactions to the

cue without participants knowing, it is likely that the customization cue did not evoke strong enough in-group and out-group associations to influence behavior. While the Slater et al. (2103) study used a similar customization cue of adding an in-group organization's logo to the victim's t-shirt and found significant effects on bystander intervention behaviors for members of the in-group, the present study did not achieve the same result with the same customization cue. The effects of social identity and associations with in-groups and out-groups on participants may vary with the type of simulation or targeted in-group. For example, in the Slater et al. (2013) study, the VR simulation included a more violent form of physical bullying toward the victim than portrayed in the present study. Also, the Slater et al. (2013) study had an all-male participant group compared to the mixed-gender participant pool in the present study. It is possible that these and other contexts influence the strength on social identity cues in a scenario such as the one in this study.

With the upcoming commercial release of the Oculus Rift technology, a key focus of this study was to investigate whether virtual reality—including customized virtual reality—could be a useful tool to increase bystander intervention in bullying situations in environments such as schools and homes. In particular, the study sought to find if using this technology would be a successful bystander intervention training tool for schools and homes. As the study did not find stronger effects of the VR conditions over the video condition, it is difficult to suggest that purchasing this technology is necessary to achieve bystander intervention education goals. However, the limitations of the VR simulations used in this study make further research needed to determine if such a suggestion is valid. A refined VR simulation may produce different effects relative to a video condition. While in many ways inconclusive, this study has several theoretical and practical implications for studying empathy, presence, attitudes, and behavior in virtual

reality and bystander intervention, as well as for applying design elements in media aiming to influence these responses. This study provides at least tentative suggestions toward a better understanding of how to evoke empathetic feelings from participants in a mediated portrayal of a bullying scenario. The study also has implications for research on presence, providing a reminder that not all immersive virtual environments are capable of producing greater presence responses than less immersive media. The study also showed that even with a clearly defined social group, effectiveness of in-group cues and is not a given. Also, this study suggests that researchers and designers developing virtual reality simulations might do well to carefully consider issues such as graphical realism, the uncanny valley autonomy and task distraction in their conceptualizations and designs.

Limitations

This study contains several limitations that should be considered when evaluating the study's findings. First, one limitation of this study is its participants' demographics. All participants in the study were Virginia Tech students and were young adults. Given an intended use for the VR simulations is for use in schools with students ranging in school year from elementary to high school, studying this participant pool may have yielded different results. Also, the length of the conditions may have been too short to have full effects on participants. For instance, the video condition was approximately 30 seconds long, and the VR simulations were approximately one minute long. Another limitation of this study is that the VR simulations and the video condition are not precisely matched. While the conditions were designed to be as comparable as possible in the study, there were still several differences between the conditions (i.e. age of characters, number of characters, overall appearance). In particular, the video condition was professionally made, whereas the VR conditions were created using prototype

technology and more limited design and programming resources, making the conditions difficult to match in terms of production values. The logistics of this study limited the resources available for production costs related to the simulation, as did the developer kit status of the VR hardware. Research on a simulation with a higher budget, a larger design team with more experience and available production time, and hardware ready for widespread commercial release may yield different outcomes. Finally, this study did not include any measures of actual anti-bullying behavior, which may be influenced in different ways than the questionnaire measures here.

Suggestions for Future Research

This study offered several possible explanations as to why the video condition produced more empathy in participants than the VR conditions, as well as explanations for the study's null effects related to attitudes and intended behavior. The findings tentatively suggest that creating a more effective simulation could have produced more significant effects of the VR conditions. This study's findings reveal several considerations for future researchers to consider when constructing VR simulations. When developing a VR simulation intended to evoke empathy and influence attitude and behaviors, researchers should include some design aspects that this study's simulations lacked. Specifically, researchers seeking to create effective VR simulations in the future should create simulations focusing on the following characteristics: photorealistic graphics, strong customization cues, and user autonomy.

This study's results suggest that to develop a more effective VR simulation, researchers should use photorealistic images. As focus group participants in this study found it difficult to empathize with the victim in the VR simulations due to the CGI graphics, future studies should use more photorealistic images in order to produce affective responses from participants. Higher quality graphics in VR simulations could result in more empathetic feelings from users as virtual

characters appear more realistic to users. Future research should involve a similar study as the present study, only using photorealistic images in a VR simulation and comparing that to the effects of a similar video condition to determine the effectiveness of a more photorealistic VR simulation.

Another characteristic future researchers should likely employ in VR simulations that incorporate customization is stronger customization cues. The effect of customization in this study was non-significant, and many focus group participants reported not noticing the customization cue in the customized VR condition. As this study used a customization cue of a school logo, future research should include stronger customization cues in simulations. When researchers are targeting in-groups to study customization effects, future studies should use stronger customization cues than one group logo. One suggestion might be to include interaction among virtual reality characters that are members of a participant's in-group in addition to an in-group logo. For example, Slater et al. (2013), in their study on bystander intervention, had an in-group virtual character talk about a common in-group subject with the participant before the virtual character became a victim of a violent situation, in which the participant could choose to intervene and stop the violence. Future research on effects of in-group customization in VR simulations should consider the use of multiple in-group components as customization cues. Also, customization cues in future research in the area might focus less on group affiliation cues, and more on individual customization cues. More individually-tailored cues, such as rendering the users' appearance accurately onto the simulation, might be more effective than the group-level cue used here.

Additionally, future research should explore VR simulations that allow for user autonomy. As findings of this study suggest that participant engagement in the VR simulation

could produce influences on attitudes and behavior, future research should add capabilities for participants to control aspects of their involvement with the simulation. Future research should involve a similar study in which participants engaging in the VR simulation are able to control their actions and have the ability to intervene in the bystander situation. Such an intervention could be based on the Slater et al. (2103) study in which participants had the option to verbally or physically intervene in a bystander situation. To create an effective VR simulation that influences empathy, attitude, and behavior, future researchers might to well to design simulations that include photorealistic images, multiple customization cues, and user control capabilities.

Conclusion

Educating students on bystander intervention and encouraging them to intervene as bystanders in bullying situations is an important strategy for anti-bullying campaigns and bullying prevention. Virtual reality is a tool that can be used to assist in bystander intervention education and can be customized to reflect in-groups and out-groups, which may increase bystander intervention behaviors. Although studies have researched participant bystander intervention in virtual reality, this study was novel in that it compared effects of a virtual reality simulation to those of a video. While no significant effects were found for measures of attitude and intended behavior, this study found that the video condition evoked more empathy from participants than the virtual reality conditions. This study is useful for schools and practitioners who develop anti-bullying campaigns, as it provides insight into how various forms of media evoke empathetic feelings for victims of bullying. Also, this study is valuable for those developing virtual reality simulations because it reveals several suggestions for how best to construct a simulation that will elicit empathetic feelings and influence users' attitudes and behavior. Virtual reality can be very effective in taking users to many places real and imagined,

but this study's results suggest that it may sometimes be a challenge to make virtual reality users feel for the characters they encounter there.

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APPENDIX A: PRE-EXPOSURE QUESTIONNAIRE

Anti-Bullying Study Pre-Questionnaire 1 – Demographics and Individual Differences

1. What is your gender?   Male   Female

2. What is your age? _____ years

3. What is your year in school?   Freshman   Sophomore   Junior   Senior

Anti-Bullying Study Pre-Questionnaire 2- CSE 1

Instructions: Please respond to the following statements on the basis of how you feel about Virginia Tech. There are no right or wrong answers to any of these statements; we are interested in your honest reactions and opinions. Please read each statement carefully, and respond by using the following scale from 1 to 7:

1.	Overall, Virginia Tech has very little to do with how I feel about myself.	1	2	3	4	5	6	7
2.	Virginia Tech is an important reflection of who I am.	1	2	3	4	5	6	7
3.	Virginia Tech is unimportant to my sense of what kind of a person I am.	1	2	3	4	5	6	7
4.	In general, Virginia Tech is an important part of my self image.	1	2	3	4	5	6	7

Anti-Bullying Study Pre-Questionnaire 3- CSE 2

Instructions: Please respond to the following statements on the basis of how you feel about being a member of social groups. There are no right or wrong answers to any of these statements; we are interested in your honest reactions and opinions. Please read each statement carefully, and respond by using the following scale from 1 to 7

		Strongly Disagree	Disagree	Disagree Somewhat	Neutral	Agree Somewhat	Agree	Strongly Agree
1.	Overall, my group memberships have very little to do with how I feel about myself.	1	2	3	4	5	6	7
2.	The social groups I belong to are an important reflection of who I am.	1	2	3	4	5	6	7
3.	The social groups I belong to are unimportant to my sense of what kind of a person I am.	1	2	3	4	5	6	7
4.	In general, belonging to social groups is an important part of my self image.	1	2	3	4	5	6	7

Anti-Bullying Study Pre-Questionnaire 4- Bully Survey

The Bully Survey – Part A

In this part, you will be asked about times when <u>you</u> were bullied.

REMEMBER: Bullying happens when someone hurts or scares another person on purpose and the person being bullied has a hard time defending himself or herself. Usually, bullying happens over and over.
- Punching, shoving, and other acts that hurt people physically
- Spreading bad rumors about people
- Keeping certain people out of a "group"
- Teasing people in a mean way
- Getting certain people to "gang up" on others

Have you been bullied this school year?
☐ Yes   ☐ No

If YES, how often have you been bullied? (Check one)
☐ One or more times a day   ☐ One or more times a week   ☐ One or more times a month

If you have not been bullied this year, you may move on to Part B.

1a. Where have you been bullied? Check all the places:

☐ academic class	☐ dining hall
☐ bus	☐ parties
☐ gym	☐ sporting events
☐ hallway	☐ bars
☐ bathroom	☐ online
☐ phone	☐ text message
☐ home	

1b. From the list below, check the ONE place you have been bullied the most.

☐ academic class	☐ dining hall
☐ bus	☐ parties
☐ gym	☐ sporting events
☐ hallway	☐ bars
☐ bathroom	☐ online
☐ phone	☐ text message
☐ home	

2. How did you get bullied? (Check how often this happened)

	Never happened	Rarely happened	Sometimes happened	Often happened	Always happened
a. Called me names	☐	☐	☐	☐	☐
b. Made fun of me	☐	☐	☐	☐	☐
c. Said they will do bad things to me	☐	☐	☐	☐	☐
d. Played jokes on me	☐	☐	☐	☐	☐
e. Won't let me be a part of their group	☐	☐	☐	☐	☐
f. Broke my things	☐	☐	☐	☐	☐
g. Attacked me	☐	☐	☐	☐	☐
h. Nobody would talk to me	☐	☐	☐	☐	☐
i. Wrote bad things about me	☐	☐	☐	☐	☐
j. Said mean things behind my back	☐	☐	☐	☐	☐
k. Pushed or shoved me	☐	☐	☐	☐	☐

3. Who bullied you most often (check all that are true):

☐ older men
☐ younger men
☐ men my age
☐ older women
☐ younger women
☐ women my age
☐ someone who is strong

☐ someone who is an adult
☐ someone who is powerful
☐ someone who is popular
☐ someone who has many friends
☐ someone who is smart
☐ someone who I don't know

4. How much of a problem was the bullying for you?

	Never a problem	Rarely a problem	Sometimes a problem	Often a happened	Always a problem
a. Made me feel sick	☐	☐	☐	☐	☐
b. I couldn't make friends	☐	☐	☐	☐	☐
c. Made me feel bad or sad	☐	☐	☐	☐	☐
d. Made it difficult to learn at school	☐	☐	☐	☐	☐
e. Didn't come to school	☐	☐	☐	☐	☐
f. I had problems with my family	☐	☐	☐	☐	☐

5. Why do you think you were bullied? Check all that are true. Because:

- ☐ the way I look
- ☐ they think I'm fat
- ☐ they think I'm skinny
- ☐ they think I look too old
- ☐ they think I look too young
- ☐ they think my friends are weird
- ☐ I'm sick a lot
- ☐ I'm disabled
- ☐ I get bad grades
- ☐ where I live
- ☐ I'm disabled
- ☐ I get good grades
- ☐ where I live
- ☐ the clothes I wear
- ☐ the color of my skin

- ☐ the country I'm from
- ☐ I am different
- ☐ the church I go to
- ☐ my parents
- ☐ my brother
- ☐ my sister
- ☐ my family is poor
- ☐ my family has a lot of money
- ☐ someone in my family has a disability
- ☐ I get angry a lot
- ☐ I cry a lot
- ☐ I can't get along with other people
- ☐ the way I talk
- ☐ my sexuality

5b. From the list below, check the MAIN reason you were bullied.

- ☐ the way I look
- ☐ they think I'm fat
- ☐ they think I'm skinny
- ☐ they think I look too old
- ☐ they think I look too young
- ☐ they think my friends are weird
- ☐ I'm sick a lot
- ☐ I'm disabled
- ☐ I get bad grades
- ☐ where I live
- ☐ I'm disabled
- ☐ I get good grades
- ☐ where I live
- ☐ the clothes I wear
- ☐ the color of my skin

- ☐ the country I'm from
- ☐ I am different
- ☐ the church I go to
- ☐ my parents
- ☐ my brother
- ☐ my sister
- ☐ my family is poor
- ☐ my family has a lot of money
- ☐ someone in my family has a disability
- ☐ I get angry a lot
- ☐ I cry a lot
- ☐ I can't get along with other people
- ☐ the way I talk
- ☐ my sexuality

6. How do you think your teachers and school staff took care of the bullying?
☐ Very well ☐ Okay ☐ Bad ☐ I don't know

7a. How do you think your teachers and school staff took care of bullying?
☐ Very well ☐ Okay ☐ Bad ☐ I don't know

9. Did your parents know about the bullying that happened to you?
☐ Yes ☐ No ☐ I don't know

10. Were you able to defend yourself from the bullying?
☐ Yes ☐ No

The Bully Survey—Part B

In this part, you will be asked about <u>other</u> students who have been bullied.

REMEMBER: Bullying happens when someone hurts or scares another person on purpose and the person being bullied has a hard time defending himself or herself. Usually, bullying happens over and over.

- Punching, shoving, and other acts that hurt people physically
- Spreading bad rumors about people
- Keeping certain people out of a "group"
- Teasing people in a mean way
- Getting certain people to "gang up" on others

Did you ever see a student other than yourself who was bullied? (Check one)
☐ one or more times a day   ☐ one more times a week   ☐ one or times a month

IF YES, how often did you see this student being bullied? (Check one)
☐ one or more times a day   ☐ one or more times a week   ☐ one more times a month

If you don not know any students who have been bullied this year, you may move on to Part C.

1a. Where was the student bullied? Check all the places:

☐ academic class   ☐ telephone
☐ bus   ☐ parties
☐ gym   ☐ sporting events
☐ hallway   ☐ online
☐ bathroom   ☐ text message

1b. From the list above, check ONE place you saw the student bullied the most.

☐ academic class   ☐ telephone
☐ bus   ☐ parties
☐ gym   ☐ sporting events
☐ hallway   ☐ online
☐ bathroom   ☐ text message

2. How did this student get bullied? (Check how often this happened)

	Never happened	Rarely happened	Sometimes happened	Often happened	Always happened
a. Called them names	☐	☐	☐	☐	☐
b. Made fun of them	☐	☐	☐	☐	☐
c. Said they will do bad things to them	☐	☐	☐	☐	☐
d. Played jokes on them	☐	☐	☐	☐	☐
e. Won't let them be a part of a group	☐	☐	☐	☐	☐
f. Broke their things	☐	☐	☐	☐	☐
g. Attacked them	☐	☐	☐	☐	☐
h. Nobody would talk to them	☐	☐	☐	☐	☐
i. Wrote bad things about them	☐	☐	☐	☐	☐
j. Said mean things behind their back	☐	☐	☐	☐	☐
k. Pushed or shoved them	☐	☐	☐	☐	☐

3. Who bullied this student (check all that are true):

☐ older men
☐ younger men
☐ men my age
☐ older women
☐ younger women
☐ women my age
☐ someone who is strong

☐ someone who is an adult
☐ someone who is powerful
☐ someone who is popular
☐ someone who has many friends
☐ someone who is smart
☐ someone who I don't know

4. How did seeing the bullying affect you?

	Never a problem	Rarely a problem	Sometimes a problem	Often a happened	Always a problem
a. Made me feel sick	☐	☐	☐	☐	☐
b. I couldn't make friends	☐	☐	☐	☐	☐
c. Made me feel bad or sad	☐	☐	☐	☐	☐
d. Made it difficult for me to learn	☐	☐	☐	☐	☐
e. I didn't come to school	☐	☐	☐	☐	☐
f. I had problems with my family	☐	☐	☐	☐	☐

5a. Why do you think this student was bullied? (Check all that are true). Because:

☐ the way they look
☐ they are fat
☐ they are too skinny
☐ they look too old
☐ they look too young
☐ their friends are weird
☐ they are sick a lot
☐ they are disabled
☐ they get good grades
☐ they bad grades
☐ where they live
☐ the clothes they wear
☐ the color of their skin
☐ the country they are from

☐ they are different
☐ the church they go to
☐ their parents
☐ their brother
☐ their sister
☐ their family is poor
☐ their family has a lot of money
☐ someone in their family has a disability
☐ they get angry a lot
☐ they cry a lot
☐ they can't get along with other people
☐ the way they talk
☐ their sexuality

5b. From the list above, check the MAIN reason this student was bullied.

☐ the way they look
☐ they are fat
☐ they are too skinny
☐ they look too old

☐ they look too young
☐ their friends are weird
☐ they are sick a lot
☐ they are disabled

☐ they get good grades
☐ they bad grades
☐ where they live
☐ the clothes they wear
☐ the color of their skin
☐ the country they are from
☐ they are different
☐ the church they go to
☐ their parents
☐ their brother

☐ their sister
☐ their family is poor
☐ their family has a lot of money
☐ someone in their family has a disability
☐ they get angry a lot
☐ they cry a lot
☐ they can't get along with other people
☐ the way they talk
☐ their sexuality

6. Did the teachers and school staff know about the bullying you saw?
☐ Yes ☐ No ☐ I don't know

7. How do you think your teachers and school staff took care of the bullying?
☐ Very well ☐Okay ☐Bad ☐ I don't know

The Bully Survey - Part C

In this part, you will be asked about when <u>you bullied</u> other students.

REMEMBER: Bullying happens when someone hurts or scares another person on purpose and the person being bullied has a hard time defending himself or herself. Usually, bullying happens over and over.
- Punching, shoving, and other acts that hurt people physically
- Spreading bad rumors about people
- Keeping certain people out of a "group"
- Teasing people in a mean way
- Getting certain people to "gang up" on others

Did you ever bully someone this school year?
☐ Yes ☐ No

If yes, how often did you bully this person? (Check one)
☐ one or more times a day ☐ one or more times a week ☐ one or more times a month

If you never bullied other students this year, go to Part D and answer the rest of the questions.

1a.Where did you bully him or her? Check all the places:

☐ academic class
☐ bus
☐ gym
☐ hallway
☐ bathroom

☐ telephone
☐ parties
☐ sporting events
☐ online
☐ text message

1b. From the list below, check the ONE place you bullied the person the most.

☐ academic class
☐ bus
☐ gym
☐ hallway
☐ bathroom

☐ telephone
☐ parties
☐ sporting events
☐ online
☐ text message

2. How did you bully this person? (Check how often this happened)

	Never happened	Rarely happened	Sometimes happened	Often happened	Always happened
a. Called them names.	☐	☐	☐	☐	☐
b. Made fun of them	☐	☐	☐	☐	☐
c. Said I will do bad things to them	☐	☐	☐	☐	☐
d. Played jokes on them	☐	☐	☐	☐	☐
e. Won't let them be a part of my group	☐	☐	☐	☐	☐
f. Broke their things	☐	☐	☐	☐	☐
g. Attacked them	☐	☐	☐	☐	☐
h. Nobody would talk to them	☐	☐	☐	☐	☐
i. Wrote bad things about them	☐	☐	☐	☐	☐
j. Said mean things behind their back	☐	☐	☐	☐	☐
k. Pushed or shoved them	☐	☐	☐	☐	☐

3. Who did you bully? (Check all that are true)

☐ older men
☐ younger men
☐ men my age
☐ older women
☐ younger women
☐ women my age
☐ someone who is strong

☐ someone who is an adult
☐ someone who is powerful
☐ someone who is popular
☐ someone who has many friends
☐ someone who is smart
☐ someone who I don't know

4. How much was this a problem for you?

	Never a problem	Rarely a problem	Sometimes a problem	Often a happened	Always a problem
a. Made me feel sick	☐	☐	☐	☐	☐
b. I couldn't make friends	☐	☐	☐	☐	☐
c. Made me feel bad or sad	☐	☐	☐	☐	☐
d. Made it difficult for me to learn	☐	☐	☐	☐	☐
e. I didn't come to school	☐	☐	☐	☐	☐
f. I had problems with my family	☐	☐	☐	☐	☐

5a. Why did you bully this person? (Check all that are true) Because:

☐ the way they look
☐ they are fat
☐ they are too skinny
☐ they look too old
☐ they look too young
☐ their friends are weird
☐ they are sick a lot
☐ they are disabled
☐ they get good grades
☐ they bad grades
☐ where they live
☐ the clothes they wear
☐ the color of their skin
☐ the country they are from

☐ they are different
☐ the church they go to
☐ their parents
☐ their brother
☐ their sister
☐ their family is poor
☐ their family has a lot of money
☐ someone in their family has a disability
☐ they get angry a lot
☐ they cry a lot
☐ they can't get along with other people
☐ the way they talk
☐ their sexuality

5b. From the list below, check the MAIN reason you bullied this person.

☐ the way they look
☐ they are fat
☐ they are too skinny
☐ they look too old
☐ they look too young
☐ their friends are weird
☐ they are sick a lot
☐ they are disabled
☐ they get good grades
☐ they bad grades
☐ where they live
☐ the clothes they wear
☐ the color of their skin
☐ the country they are from

☐ they are different
☐ the church they go to
☐ their parents
☐ their brother
☐ their sister
☐ their family is poor
☐ their family has a lot of money
☐ someone in their family has a disability
☐ they get angry a lot
☐ they cry a lot
☐ they can't get along with other people
☐ the way they talk
☐ their sexuality

6. Did the teachers and school staff know about the bullying you did?
☐ Yes ☐ No ☐ I don't know

7. How do you think your teachers and school staff took care of the bullying?
☐ Very well ☐ Okay ☐ Bad ☐ I don't know

The Bully Survey—Part D

In this part, you will be asked about your thoughts on bullying.

1. How much do you agree with each sentence?

	Totally false	Sort of false	Both true and false	Sort of true	Totally true
a. Most people who get bullied ask for it.	☐	☐	☐	☐	☐
b. Bullying is a problem for kids.	☐	☐	☐	☐	☐
c. Bullies are popular.	☐	☐	☐	☐	☐
d. I don't like bullies.	☐	☐	☐	☐	☐
e. I am afraid of bullies.	☐	☐	☐	☐	☐
f. Bullying is good for wimpy kids.	☐	☐	☐	☐	☐
g. Bullies hurt kids.	☐	☐	☐	☐	☐
h. I would be friends with a bully.	☐	☐	☐	☐	☐
i. I can understand why someone would bully others.	☐	☐	☐	☐	☐
j. I think bullies should be punished.	☐	☐	☐	☐	☐
k. Bullies don't mean to hurt anybody.	☐	☐	☐	☐	☐
l. Bullies make kids feel bad.	☐	☐	☐	☐	☐
m. I feel sorry for kids who are bullied.	☐	☐	☐	☐	☐
n. Being bullied is no big deal.	☐	☐	☐	☐	☐

2. Is bullying a problem in your school?
☐ Yes ☐ No

3. Do you think schools should worry about bullying?
☐ Yes ☐ No

APPENDIX B: POST-EXPOSURE QUESTIONNAIRE

Anti-Bullying Study Post Questionnaire 1 - Presence

Please rate your level of agreement with the following statements on a scale from 1 to 7 with "1" being "there" and "7" being "not there."

1. While engaging in the virtual reality simulation, how much did you feel like you were really "there" in the virtual reality environment?

There	1	2	3	4	5	6	7	Not there

2. While engaging in the virtual reality simulation, how much did you feel like the virtual reality environment was a real place?

Real	1	2	3	4	5	6	7	Not real

3. While engaging in the virtual reality simulation, how much did you feel like other characters in the simulation were real?

Real	1	2	3	4	5	6	7	Not real

Anti-Bullying Study Post Questionnaire 2—Empathy Set

Please indicate how much you felt each of the emotions listed below for the victim of the bully during the exercise on a scale from 1 to 7 with "1" being "Not at all" and "7" being "Extremely."

	Not at all						Extremely
Sympathetic	1	2	3	4	5	6	7
Compassionate	1	2	3	4	5	6	7
Soft-hearted	1	2	3	4	5	6	7
Warm	1	2	3	4	5	6	7
Tender	1	2	3	4	5	6	7
Moved	1	2	3	4	5	6	7

Anti-Bullying Study Post Questionnaire 3—Attitudes Toward Bullying Victims Questionnaire

Please indicate how much you agree with the statements listed below about your concern for and feelings toward bullies and bully victims on a scale from 1 to 9 with "1" being "Strongly disagree" and "7" being "Strongly agree."

	Strongly disagree								Strongly agree
a. For most people who are bullied, it is their own fault they are bullied.	1	2	3	4	5	6	7	8	9
b. Most people who are bullied could have avoided being bullied.	1	2	3	4	5	6	7	8	9
c. Our society does not do enough to help people who are bullied.	1	2	3	4	5	6	7	8	9
d. Our society should do more to protect the welfare of people who are bullied.	1	2	3	4	5	6	7	8	9

Please indicate how much you agree with the statements listed below about your concern for and feelings toward bullies and bully victims on a scale from 1 to 9 with "1" being "Not at all" and "9" being "Very much."

	Not at all								Very much
a. How much do you personally care about the plight of people who are bullied?	1	2	3	4	5	6	7	8	9

Please indicate how much you agree with the statements listed below about your concern for and feelings toward bullies and bully victims on a scale from 1 to 9 with "1" being "Not at all important" and "9" being "Extremely important.

	Not at all important								Extremely important
a. Compared with other social problems we face today (e.g., crime, education, drugs, homelessness, environmental protection, energy conservation), how would you rate the importance of helping those who are bullied?	1	2	3	4	5	6	7	8	9

Please indicate how much you agree with the statements listed below about your concern for and feelings toward bullies and bully victims on a scale from 1 to 9 with "1" being "Extremely negative" and "9" being "Extremely positive."

	Extremely negative								Extremely positive
a. In general, what are your feelings toward people who bully others?	1	2	3	4	5	6	7	8	9

Anti-Bullying Post Questionnaire 4 –Bully Survey

The Bully Survey—Part D

In this part, you will be asked about your thoughts on bullying.

1. How much do you agree with each sentence?

	Totally false	Sort of false	Both true and false	Sort of true	Totally true
a. Most people who get bullied ask for it.	☐	☐	☐	☐	☐
b. Bullying is a problem for kids.	☐	☐	☐	☐	☐
c. Bullies are popular.	☐	☐	☐	☐	☐
d. I don't like bullies.	☐	☐	☐	☐	☐
e. I am afraid of bullies.	☐	☐	☐	☐	☐
f. Bullying is good for wimpy kids.	☐	☐	☐	☐	☐
g. Bullies hurt kids.	☐	☐	☐	☐	☐
h. I would be friends with a bully.	☐	☐	☐	☐	☐
i. I can understand why someone would bully others.	☐	☐	☐	☐	☐
j. I think bullies should be punished.	☐	☐	☐	☐	☐
k. Bullies don't mean to hurt anybody.	☐	☐	☐	☐	☐
l. Bullies make kids feel bad.	☐	☐	☐	☐	☐
m. I feel sorry for kids who are bullied.	☐	☐	☐	☐	☐
n. Being bullied is no big deal.	☐	☐	☐	☐	☐

2. Is bullying a problem in your school?
☐ Yes ☐ No
3. Do you think schools should worry about bullying?
☐ Yes ☐ No

Anti-Bullying Post Questionnaire 5 –Anticipated Future Bystander Behavior

Please indicate how likely you are to engage in the behavior stated below on a scale from 1-5 (1= "Unlikely", 5= "Very likely").

	Unlikely	Somewhat unlikely	Somewhat likely	Likely	Very likely
a. Confront a friend who plans to bully someone.	1	2	3	4	5
b. Confront a friend if I hear rumors that they have bullied someone.	1	2	3	4	5
c. Check in with a friend who was recently in a bullying situation.	1	2	3	4	5
d. Say something to a friend who is about to start a bullying situation.	1	2	3	4	5
e. Express concern if a friend makes fun of someone else.	1	2	3	4	5
f. Report a friend to the police if I heard rumors that they were bullying someone.	1	2	3	4	5
g. Challenge a friend who says it is ok to bully someone else.	1	2	3	4	5
h. Call for help (i.e., call 911) if I saw a group of people bullying someone in the parking lot.	1	2	3	4	5
i. Call for help if I see someone in a bullying situation calling out for help.	1	2	3	4	5
j. Tell an RA or other campus authority about information I might have about a bullying situation even if pressured by my peers to stay silent.	1	2	3	4	5
k. Go with a female friend to the police department if she says she was bullied.	1	2	3	4	5
l. Go with a male friend to the police department if he says he was bullied.	1	2	3	4	5
m. Visit a website to learn more about bullying.	1	2	3	4	5
n. Join an organization that works to stop bullying.	1	2	3	4	5
o. Participate in a rally on campus to stop bullying.	1	2	3	4	5
p. Take a class to learn more about bullying and bullying interventions.	1	2	3	4	5

Anti-Bullying Post Questionnaire 6 –Retrospective Reports of Bystander Behavior

Please indicate whether you have participated in the behavior stated below in the past 12 months, by checking either "Yes," "No," or "Wasn't in the situation."

	Yes	No	Wasn't in the situation
a. Confront a friend who plans to bully someone.	☐	☐	☐
b. Confront a friend if I hear rumors that they have bullied someone.	☐	☐	☐
c. Check in with a friend who was recently in a bullying situation.	☐	☐	☐
d. Say something to a friend who is about to start a bullying situation.	☐	☐	☐
e. Express concern if a friend makes fun of someone else.	☐	☐	☐
f. Report a friend to the police if I heard rumors that they were bullying someone.	☐	☐	☐
g. Challenge a friend who says it is ok to bully someone else.	☐	☐	☐
h. Call for help (i.e., call 911) if I saw a group of people bullying someone in the parking lot.	☐	☐	☐
i. Call for help if I see someone in a bullying situation calling out for help.	☐	☐	☐
j. Tell an RA or other campus authority about information I might have about a bullying situation even if pressured by my peers to stay silent.	☐	☐	☐
k. Go with a female friend to the police department if she says she was bullied.	☐	☐	☐
l. Go with a male friend to the police department if he says he was bullied.	☐	☐	☐
m. Visit a website to learn more about bullying.	☐	☐	☐
n. Join an organization that works to stop bullying.	☐	☐	☐
o. Participate in a rally on campus to stop bullying.	☐	☐	☐
p. Take a class to learn more about bullying and bullying interventions.	☐	☐	☐

Anti-Bullying Study Post Questionnaire 7- Manipulation Check

1. **Was the bully victim in the virtual reality simulation wearing clothing with a Virginia Tech logo?**
☐ Yes ☐ No

APPENDIX C: FOCUS GROUP MODERATOR'S GUIDE

These questions will be used as prompts for discussion among focus group participants.

What worked well about the video/VR simulation? What about the video made you feel empathy for the victim and might influence your attitudes and behavior in the future when you may be a bystander during a bullying episode?

What did not work well about the video/VR simulation? What was ineffective in terms of making you empathetic for the victim and influencing your attitudes and behavior in the future when you may be a bystander during a bullying episode?

What would you change about the video/VR simulation to make it more effective at making people feel empathy for the victim and encouraging bystanders to intervene in bullying episodes?

The video had photorealistic video of real actors, while the VR simulation had computer-generated characters. Did that influence your responses? Would you have responded differently

if the VR simulation used photorealistic video with real actors instead of computer-generated characters?

Both the video and VR simulation took you through a scenario without you controlling the character's actions. Would you have responded differently if the VR simulation involved you making interactive choices and controlling your actions and movements in the simulation?

Did the customization in the customized VR simulation affect your feelings toward the bullying victim? Why or why not?

APPENDIX D: FOCUS GROUP 1 TRANSCRIPT

Moderator 1: Introduction

Question 1 [0.00]

Moderator 2: What worked well about the video/VR simulation? What about the video made you feel empathy for the victim and might influence your attitudes and behavior in the future when you may be a bystander during a bullying episode?

Response 1: Is this the first one?

Moderator 1: Mhmm.

Response 2: I personally thought the simulation was kind of hard to empathize with anyone because you couldn't see like their faces you couldn't see who was talking, almost like the faces didn't go with the body language, so...

Response 3: I just kind of saw this thing as a pre I don't know acting thing, like you know it wouldn't be that good, but you if you got a good feeding off the people you would put it into production type of thing, I just watched it didn't get much empathy out of it, just kind of watched it, just observed, there really wasn't much to it.

Moderator 1: Ok.

Response 4: There wasn't like much movement between the people that were in the simulation so like their actions wouldn't match up with their words and their voices so it was kind of like weirdish.

Response 5: It was very blocky like the frame rate wasn't like smooth.

Moderator 1: Right, right, like a little choppy?

Response 6: Yeah, mhhmm.

Moderator 1: Ok cool.

Question 2 [1:13]

Moderator 2: So the next question was what did not work well about the video/VR simulation? Which we kinda just talked about, but is there anything else that was ineffective in terms of making you empathetic for the victim?

Response 7: I'm sorry did you say is there anything that did make us empathetic or didn't?

Moderator 2: Yeah actually, um is there anything that did make you feel empathetic?

Response 8: Yeah I guess actually the voiceover was mean so you were like ok that sucks for whoever that person is but you couldn't see really anything so.

Response 9: I was hearing the bullying, and even though I was watching that I was picturing something, that action, that actually happening, I wasn't getting from the video just kinda like I was sitting and hearing it but in my head actually putting a proper picture in place to see how that would actually make me feel.

Moderator 1: Gotcha.

Response 10: Yeah like the auditory was more effective.

Response 11: Much more.

Moderator 1: Ok.

Question 3 [2:08]

Moderator 2: What would you change about the video/VR simulation to make it more effective at making people feel empathy for the victim and encouraging bystanders to intervene in bullying episodes?

Response 12: Um one thing I would actually do is put a bystander in there, because I feel like there was actually no one even watching, so especially if you're trying to target helping bystanders get up and do something there should one hundred percent be a bystander in the simulation.

Response 13: Yeah, when you have a simulation where there's three people [hard to hear]… like you [hard to hear]…you can show them it's possible.

Moderator 1: Yeah like some action being taken and then maybe comparing one action verse another action?

Responses 14 & 15: Mhmm.

Moderator 1: Ok so, interesting. So you guys didn't feel like you were the bystander?

Response 16: Oh [laughs]. I felt like the bystander but I couldn't do anything to help so I kinda just like oh I'm just walking by.

Moderator 1: Right, so hard to say whether you're really the bystander or you're just kind of watching.

Response 17: I think they could add more people you would say, that would've made it where you feel like you could've done something, because if that was actually a real life situation, they could potentially turn on you, because that could've been a two verse one situation, because there really was no one in the hall once you turned that corner, it was just an empty hall except for those girls. So it really would've been more effective if you had like three or four people scattered in there because then worse case if they try to d something to other people, people could come join you because it's always, you need more than one person especially in high school and middle school because in a school setting no individual is going to stand out, it's not like the real world where you have to think like that, they all think it's a group mentality, it's a pack thing. So, to have more people around in the situation might be more beneficial for you to actually help.

Response 18: Also, like making it as if you're the bystander, like you know you're, like seeing it through the goggles and stuff, like you know oh that's what your role is in the simulation. You know you can't actually do anything so by maybe like, watching someone do something and having you be the bystander through the simulation that would help I think.

Moderator 1: Okay.

Response 19: I would just say like make the video more detailed because it's just like, I guess this blocky thing, like you can't really emphasize with them.

Moderator 2: Like the graphics more detailed?

Response 20: Yeah, yeah.

Moderator 1: Yeah. Ok.

Question 4 [4:18]

Moderator 2: The video had photorealistic video of real actors, while the VR simulation had computer-generated characters. Did that influence your responses? Would you have responded differently if the VR simulation used photorealistic video with real actors instead of computer-generated characters?

Response 21: I think it would've made me more, a bit more empathetic and felt like I was actually there if I was like, if the people were more real looking, because like when I watched the video I was like, I really empathized with them, and I wasn't even there but.

Response 22: I almost felt like it was like the beginning of a computer game. You know like when they do like some sort of acting thing, you know like, in the 90s and then like enter into the game portion you know like that's how it was.

Moderator 1: Like in Nintendo and…

Response 23: Yeah exactly.

Moderator 1: Where it would play something first and then go into the game.

Question 5 [5:16]

Moderator 1: Just a quick question that made me think that, do you guys think that if there were the photorealistic characters in the VR, do you think that that could be more effective than just the video? Or, is it hard to tell?

Response 24: I feel like it should be, especially if the voices matched what they're doing then I think it would be a lot more effective because you are there, you're in that situation instead of just watching the video on the screen. So like I think that would be really effective.

Response 25: I think the message would be a lot more clear if you were simulating watching and you could actually help because then you could be like oh I did something, look I'm in the eyes of someone who is doing this, I can do it too. If you do that, really in my opinion, it makes it

look like it's ok to walk by, even though the ending of the ad says anti-bullying, the whole ad no

one is doing anything, they just watch it and walk away, and it's like ok there you go, I feel like

it kinda gave like a negative twist to the image by not doing anything; being like ok it's here but

we know it's here, we all went to middle school we're all that age or whatever. You should

actually show someone doing something instead of actually just showing the actions.

Response 26: Because the thing I liked about the video is that they showed the girl in the end

watching through the mirror, at least you saw that person like not doing something but like

wanted to, you didn't get that sort of emotion from the simulation. So, if you had the simulation

walk up and then a voice in the background saying oh wait that's my voice sort of thing, and you

had them stop, that would definitely, you know, change the whole simulation.

Moderator 1: Ok that's really good, those are really good perceptions. Yeah, I think the next

one will really lead into what you guys are talking about.

Question 6 [6:59]

Moderator 2: Both the video and VR simulation took you through a scenario without you

controlling the character's actions. Would you have responded differently if the VR simulation

involved you making interactive choices and controlling your actions and movements in the

simulation?

Response 27: Yeah, I think that would.

Response 28: [Hard to hear].

Question 7 [7:26]

Moderator 2: Did the customization in the customized VR simulation affect your feelings toward the bullying victim? Why or why not?

Response 29: That was the VT shirt, right?

Moderator 1: Yeah, so did you guys pick up on that?

Response 30: Yeah.

Response 31: I really didn't, I was trying to look for something, and I didn't see the difference.

Moderator 1: Okay.

Response 32: What changed?

Moderator 1: The person being bullied, the victim's shirt had a Virginia Tech logo on it, and it was like a maroon color. Okay, so one person noticed. So, that's interesting because people hadn't really noticed either.

Response 33: Basically, that time, knowing that it was going to be different, I was looking to see what was different and I thought I picked it up in the beginning, but I guess that wasn't it, so I forgot to keep looking after that.

Moderator 1: Gotcha, yeah I wasn't sure if I should tell you if something was different or not, but I figured if I showed you the same thing again without telling you, you would be like she's showing us the same thing again.

Response 34: I remember you said something was different, but it started out the same, and then I saw she was wearing maroon and orange, I saw that she was wearing orange pants and I was like why is she wearing orange pants with maroon, but then I saw the VT logo.

Moderator 1: Gotcha.

Question 8 [8:36]

Moderator 1: Do you think that, well it's only really speculating because one of you saw it but, would that [customization] change your opinion on customization or affect your feelings at all [if you had seen the customization]?

Response 35: As soon as I saw it, the first thing I thought was like, oh man, college bullying is real and like I'm in college too, but like, I didn't, I still felt so helpless because I was like oh man this is a VT student, and I can't really help them.

Response 36: I just feel like we're too old of it to really touch base, if we were in middle school or high school and they had our shirt, that's a major difference but in college, you can walk away, most people; there's thirty thousand people, if you just go somewhere else, you can do it differently, that's kind of the difference from where we are and where they're at, the younger age, they can't get away from it. They're stuck, having to go on the same bus every morning, there's no way to get off that bus away from that bully or something like that. I fee like if they had the logo for the younger age, that would make a difference, that would be effective, but as a college student, not really.

Moderator 1: Yeah.

Response 37: You can just find other friends or get your bigger friends and beat up on them, like leave me alone or something like that. It just doesn't happen in college I feel like.

Moderator 1: Yeah, it's definitely different, there are different ways to get out of it, whereas you're kind of trapped in your situation in middle school and high school. Okay, I know I have one more question, then if Moderator 2 you have any more questions, you can just kind of just go ahead with them.

Question 9 [10:09]

Moderator 1: Okay so, do you think it made any difference that the actors, the characters in the simulation, being a little bit older than the ones in the video? Or, that just really wasn't…

Response 38: I did notice that they were older like you obviously gave the girls like curves and in the actually video it was like younger people. I think that it's more relatable to make them younger. I thought that that hit home more, especially for like the age group that you would be targeting. Because I don't really think you would be targeting college students. Then it's better to make them younger than like older high school students.

Response 39: If you make them younger, like elementary students, like really young, I feel like the younger they are the more it touches your heart. Like if I had a little kid, you don't want to, you're saying your little kid is off in the big bad world and they get picked on. Like this is something that you really don't want, so I feel like if you had a first grader or second grader, that would touch twice as hard as a middle schooler, the young kid would hurt even more, because I know I was bullied in kindergarten and that just was awful. And you really couldn't do anything about it, and the kid ended up being kicked out of school because he bullied too many people. It was that kind of situation and it ended right there, but it was awful at that young age being bullied and you couldn't do anything because you were in the same classroom everyday and the same play area. So I feel like the younger age would hit even harder.

Moderator 1: Right, because they're even more helpless?

Response 40: Yeah. It starts really young, I mean those kids are going to do it their whole lives if you don't tell them no, I mean I ended up going to high school with that kid, it ended up coming full circle. He ended up being, I mean he's working at a Target now, he's a nobody. You're like, if you could've taught him at a younger age to not act like that, to be a better kid, I feel like he could've been someone completely different. If someone told him stop, don't pick on that person, go play somewhere else or something like that, it could've changed a lot of things.

Moderator 1: Yeah, definitely, okay. So, maybe even younger intervention than middle school.

Response 41: Or, if someone is getting bullied there needs to be like, if a teacher also intervenes. Because, I know one time, sometimes the teachers just go like oh kids will be kids kind of thing, so hopefully if a teacher intervenes too, that will be a message to them as well. They should intervene; it's their job to protect the students.

Moderator 1: Yeah, okay, good idea. Do you have any other questions?

Moderator 2: I know you guys are talking about the difference between middle school, high school, and college, do you think if the bullying situation was different, if we were still targeting college students, like if it was more like people gossiping about each other, or forms of bullying that, what would you describe kinds of bullying in college?

Response 42: I would say bullying in college would be, it wouldn't be very face-to-face, it would be more online. It would be online stuff, like, posting pictures that aren't very appealing, not appealing, but like flattering to yourself or just like writing things on people's walls on Facebook or like on Yikyak and stuff that's like an anonymous thing, yakking about certain people, like in a mean way, which is definitely a problem.

Response 43: If you were looking at targeting college students, you would have to change almost the entire simulation just because it looked like a high school. You know so, that's mainly what I would change.

Response 44: I'm part of a coed fraternity, so I feel like a lot of the problems deal with when so and so dates so and so and then someone is jealous, and then they just start saying hate about that person who's dating the guy or something. I feel like it is also a lot more on the girl's side, I might be playing the [can't understand] but I fee like the girls, if it's a really close friend or close friends, you get close circles like that, and then someone gets really hurt by that, or someone just doesn't have the guts to say something if feel like that has happened a lot and that has broken a lot of relationships up in the fraternity because so and so date another person and it ended like four different relationships. So I feel like that, and then one person started spreading mean rumors about the girl, so I feel like that, it would be really hard to do something about it.

Moderator 2: Like hurting someone's reputation

Response 45: Yup, exactly. They just say mean things about them or just hurtful things. Also, different things about weight; I know my girlfriend, she's really skinny and she gets people who say oh you need to eat, people don't think that's attractive, things like that and its from girls who are a little bit heavier than her and it's like that is just mean to say to a girl for no reason just because you feel jealous or something like that, or whatever the reason is, but yeah it would just be totally, totally different to have the simulation be set in a college setting.

Moderator 1: Yeah, there would just be totally different issues.

Response 46: Yeah, just from my personal experience, like frats and sororities, I feel like are the main people that are like the bullies, especially because I know like frat brothers who have like picked on other people because they were like nerdy looking which is so dumb because that's like a high school thing to do so, or like they weren't in a frat, so they'd like bother them or something like that, which is really dumb. It's a mean thing to pick on them, but like I feel like frats and sororities are the main, not like everyone in a frat or sorority is a bully but like a good portion of the people, because they were the ones that were the bullies in high school, so that's just my personal experience with it.

Moderator 1: Yeah, that could almost be, if there were really going to be something like this for college, that could almost be like a target group, target audience to do an intervention with. Are there any other questions? I think I have just one more and then we will be finished because it's almost time.

Question 10 [15:42]

Moderator 1: Do you think the gender of the people in the video made a difference to you because they were women? Do you guys think that that made you feel any kind of empathy toward them? Or guys, more or less? Or, did you think that it wasn't really a factor, if there were guys it would've been the same thing?

Response 47: I think you could've done either gender, but I would keep all three of the gender the same.

Moderator 1: Okay.

Response 48: Whichever way you go.

Response 49: I don't know, because I mean, I feel like if you mix the genders, that's also a very real situation where, um, like both genders bother one gender, or bother both genders at the same time so it's not like just one. Because the way the video, I felt like it shows the girls very caddy, and it not only shows that girls are also bullies, and they are, but it also shows that like, like he said, it gives the perspective that only girls bully. Which is so no true.

Moderator 1: Right.

Response 50: and like it should show that both genders are equal bullies, and like that they, it's a situation in both genders, it's not just one gender that does this.

Moderator 1: Gotcha, okay that's good, because you don't want to give a bias view to the people that you're trying to influence there.

APPENDIX E: FOCUS GROUP 2 TRANSCRIPT

Moderator 1: Introduction

Question 1 [0.00]

Moderator 2: What worked well about the video/VR simulation? What about the video made you feel empathy for the victim and might influence your attitudes and behavior in the future when you may be a bystander during a bullying episode?

Response 1: Well the video thing just kinda made it seem a little more real. I'd like to think I would jump into the middle of something like that but definitely have more inclination to do so now.

Moderator 1: Good, so you thought the video might have changed your behavior a little in a more positive way.

Question 2 [0.45]

Moderator 2: What did you find motivating about it?

Response 2: Again just cause it was like a virtual reality thing you could kind of put yourself in the shoes of someone who would be witnessing it in real life, or it might bring up memories things like that of past times when you witnessed it.

Moderator 1: Anyone else?

Response 3: Oh and uh, just a 2D video is kind of like obviously like acting, I don't know, its kind of easy to detach yourself from a short tv commercial, but like in the VR, it actually walked you past what's going on, I felt kind of bad. I mean, you know because the camera was moving you so I mean, even if I did want to do anything, I felt bad cause it felt like you're just walking by.

Moderator 1: So like the presence, the actual movement? That's Good. OK, that's interesting, that's something we added so you could walk by it get that feeling so that's interesting that that's how it....

Response 4: Whole perspective on it.

Moderator 1: Uh hum, yeah.

Response 5: That's kind of like for me, you know, you could look, and kind of put you more in the situation rather than say like the commercial, whatever, is more of you know, film that you could tell so.

Moderator 1: Right, Ok, Great.

Question 3 [2.12]

Moderator 2: What did not work well about the video VR simulation and what was ineffective in terms of making you feel empathetic for the victim and influencing your attitudes and behavior in the future when you might be a bystander during a bullying episode?

Response 6: I guess something that didn't work quite as well like, for the simulation even though you are like walking past it and put it in that perspective, it obviously was animated and not real life, so you don't feel as much empathy I guess for the victim, cause you know it's animated.

Moderator 1: Do you think, well I guess I'll get to that actually, Different question.

Question 4 [2.52]

Moderator 2: OK. What would you change about the video/VR simulation to make it more effective at making people feel empathy for the victim and encouraging bystanders to intervene in bullying episodes?

Response 7: Making it more realistic would be cool. But then maybe having like a second video that had like the person wearing the goggles getting involved, would be a like a cool way to see it.

Moderator 1: Ok. So having maybe that and then maybe having, um an alternative one, where they actually then go ahead and take some sort of action would have been helpful? Ok.

Question 5 [3.31]

Moderator 2: The video had photorealistic video of real actors, while the VR simulation had computer-generated characters. Did that influence your responses? Would you have responded differently if the VR simulation used photorealistic video with real actors instead of computer-generated characters?

Response 8: Yeah, I definitely think so.

Response 9: Uh hum.

Response 10: I'm not so sure. I don't think it matters that much.

Moderator 1: You think you can kind of infer regardless?

Response 11: Yeah, It could have been more realistic. I feel like, at first I wasn't even sure what, why they were just kind of standing there, so that if it was animated that would be good. But the presence was still there even without photorealistic graphics.

Moderator 1: Ok cool.

Response 12: But I mean that's just me. I mean the video it would be great too. I'm not sure.

Moderator 1: Ok. What do the rest of you, do you think more photo realistic would have changed your opinion in the VR?

Response 13: Uh hum.

Moderator 1: Something that looked more like the video but in the VR?

Response 14: You don't have to try to actively try and imagine, like oh what would this look like in real life.

Moderator 1: Right, Ok.

Response 15: Also make like the headache factor [can't hear].

Moderator 1: Right, A couple of people watching it doesn't make them feel [can't hear].

Moderator 2: Did you guys like the VR or find it more uncomfortable?

Response 16: I thought it was cool.

Response 17: Uh hum.

Response 18: I don't know if I would do it every day, but you know what I mean, but it's like it's like one of the first times I've used it, so that's pretty cool.

Question 6 [5.03]

Moderator 2: OK cool. Both the video and VR simulation took you through a scenario without you controlling the character's actions. Would you have responded differently if the VR simulation involved you making interactive choices and controlling your actions and movements in the simulation? And why or why not?

Response 19: If I could, probably would, just because that's what you're supposed to do, and it was just a simulation [can't tell]. I think it definitely would have been easier, to be like, intervene in a video game than in real life, so I don't know if that's like, your question either.

Moderator 2: Gotcha.

Response 20: That's a good point. I think I agree with that.

Moderator 1: Like there aren't any consequences and where you are unable to yeah.

Response 21: Plus like you're walk, you know you're there so like, what if like a better person it's like nothing, like you know what I mean? Like you're the only person and you're at your locker and you're just like so.

Moderator 1: Right, right. Do you think if you could take that action in the video you could imagine yourself like younger or something and in this kind of situation if you watched that video and were able to take action in the video, do you that that would ever change anything, like in real life? Or not really?

Response 22: I think it's hard to speak for like I don't know was it supposed to be for like middle or high school?

Moderator 1: Yeah, uh- hum.

Response 23: I can remember awkward insecure me back in eighth grade. I hate to admit it, probably would have walked by.

Moderator 1: Right exactly.

Response 24: I kind of hard to imagine like how a group of like really young kids would react to it.

Moderator 1: Uh- hum. Yeah exactly. OK.

Question 7 [6.43]

Moderator 2: And did the customization in the customized VR simulation affect your feelings toward the bullying victim? Why or why not?

Moderator 1: So, How many of you caught on that the second one that they are wearing a Virginia Tech shirt, the victim was wearing a Virginia Tech shirt?

Response 25: That's what it was.

Question 8 [7.00]

Moderator 1: About half and half. OK, interesting. That's really what a bunch of other people have tested too. Actually that's more than normal. Um out of like 80 people, I think there were

only some. So do you think, those of you that picked up on that, did that effect your feelings towards the victim at all?

Response 26: Uh-uh.

Moderator 1: No?

Response 27: Not really, no.

Moderator 1: What did you think?

Response 28: I wondered what I missed in the first video.

Response 29: I know a little bit, just because like especially with yesterday. I don't know a lot of pride going round. So personally whenever I see somebody in Virginia Tech stuff, I'm not from Virginia, so I see it and a big connection and like identifying.

Moderator 1: Yeah. That's a good point. OK. That's great. Alright. There's like a million questions I could ask you guys, but I guess we should probably keep it rather simple. For the sake of everyone's time.