

**Virtual Perspective-taking: Examining Empathy Gaps for  
Children's Social Pain related to Bullying**



Deirdre Chambers

N00162906

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Thesis submitted as a requirement for the degree of MSc in Cyberpsychology, Dún  
Laoghaire Institute of Art, Design and Technology, 2019.

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Word count: 7,675

**Declaration**

I, Deirdre Chambers, declare that this thesis is entirely my own work and has not been previously submitted to this or any other third level institution.

Name \_\_\_\_\_

Signed \_\_\_\_\_

Date \_\_\_\_\_

### **Acknowledgements**

I would like to thank Robert Griffin, my supervisor, who gave me great help and support throughout this project. I would like to thank my family for all their patience and love. I would like to thank Lara, Ingrid and Katie who have made sure that I am graduating not just with a degree, but with three solid friendships as well. Most of all I would like to thank my mother who encouraged me to do this course and for that I am forever grateful.

Sheas mé ar droichead 's d'fhéach ós mo chomhair amach,  
D'amharc mé ar an mbóthar slán, sábháilte i m'dhaidh,  
Thugas mo chúl ar an rud choitianta,  
'S ar an mbealach nua romham thugas mo chroí.

*Bernadette Ní Shamraigh*

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**Abstract**

The purpose of this study was to measure children's estimations of social pain using a virtual reality (VR) bullying simulation. A mixed methods design was employed, measuring social pain scores, empathy gaps, gender differences, and exploring children's explanations for victimization. A child sample ( $n = 142$ ) completed imagine-self perspective-taking tasks before and after they virtually experienced the perspective of a victim or a bystander. VR perspective-taking did not increase social pain scores and no evidence of the empathy gap was found. Gender differences were found in social pain appraisals, with females estimating higher scores. Responses to an open-ended question suggested that children explain victimization through individualistic reasoning.

## Introduction

Bullying, a common form of social suffering, has been identified by the World Health Organization (Srabstein & Leventhal, 2010) as a global health and safety issue. The Irish Department of Education and Skills (2013) issued the National Action Plan on bullying making it a requirement that schools have an anti-bullying policy in place. These policies have been criticised for a lack of inclusivity (Purdy & Smith, 2016). Furthermore, in a large sample of Irish adolescents, 14 % reported that they had been face-to-face bullied, 10 % reported that they had been cyberbullied, and a further 10 % reported that they had been victims of both types of bullying (Callaghan, Kelly, & Molcho, 2014). This suggests that the anti-bullying programmes in place are not sufficiently dealing with the issue (Foody, Samara, & O'Higgins-Norman, 2017). Researchers (Graf, Yanagida, & Spiel, 2019; Ingram, Espelage, Merrin, Valido, Heinhorst, & Joyce, 2019) have recommended that future studies examine more novel and engaging interventions that are grounded in research (Hall, 2017) to combat school bullying.

Empathy is the ability to take the perspective of another individual and understand the emotions that they are feeling, including pain (Davis et al., 2004). Previous literature suggests that people have a tendency to underestimate the severity of this pain unless they are actively experiencing a similar pain (Loewenstein, 1996). This is known as the empathy gap phenomenon (Loewenstein, 1996) and it has been displayed in situations of social pain, like bullying (Nordgren, Banas, & MacDonald, 2011).

Graf and colleagues (2011) have suggested that anti-bullying programmes can be more effective if they incorporate perspective-taking tasks. Virtual reality (VR) offers an immersive and engaging way of experiencing another person's perspective (Herrera, Bailenson, Weisz, Ogle, & Zaki, 2018). Researchers (Nordgren et al., 2011) have also suggested that actively experiencing a socially painful situation can lead to a better understanding of the severity of the pain involved.

Taking into account the findings of previous studies, the present study conducted an examination into children's perceptions of social pain related to a virtual bullying simulation. The empathy gap phenomenon was explored by having children experience bullying either through a victim's perspective or a bystander's perspective. This study also examined gender differences in social pain estimations and administered an open-ended question to learn more about children's explanations for why people get bullied.

### Literature Review

The overarching goal of the present study was to examine the concept of social pain, particularly social pain involved with bullying. The study explored empathy gaps and how VR perspective-taking could display this phenomenon occurring in a child sample. These goals were grounded in the following literature.

#### Social Pain

When people think of pain, physical injury tends to come to mind first. Another form of pain, that has been described as human-specific is social pain (Murata & Watanabe, 2017). Social pain can be understood as pain experienced as a result of social relationships being damaged or lost (Eisenberger & Lieberman, 2004) such as bereavement, rejection, and exclusion (MacDonald & Leary, 2005). Panksepp (1998) has argued that social pain is adaptive, in that it encourages the formation of social relationships through attachment and discourages social separation, particularly during infancy.

A small body of research has examined gender differences in social pain perception. Murata and Watanabe (2017) found that female participants who were high in agreeableness displayed greater social empathy when observing another person's social pain. These results should be interpreted cautiously considering that the sample was not balanced for gender (19.92% were female). Another study found greater social pain-related neural activity in females that was mediated by depressed mood (Eisenberger, Inagaki, Rameson, Mashal, & Irwin, 2009). Social pain appraisals can also be affected by in-group empathy bias (Villar, Rodríguez, Rodríguez, & Pérez, 2018). Researchers found that children estimated higher social pain scores for pictures of people they considered to be in their in-group (Villar et al., 2018).

Nordgren and colleagues (2011) argue that being able to correctly estimate social pain is important because it determines individuals' responses to socially painful experiences. This indicates a need for accurate estimations of social pain. Researchers (Nordgren et al., 2011) argue that people frequently underestimate the intensity of social pain and that their estimates can only be amended by actively

experiencing the socially painful situation for themselves. The tendency to incorrectly estimate the severity of pain, both physical and social, can be attributed to what Loewenstein (1996) has termed a cold-to-hot empathy gap.

### **Empathy Gaps**

Empathy is the ability to take the perspective of another individual and understand what emotions they are feeling in a particular situation (Davis et al., 2004). Empathy gaps occur when an individual in a *cold* neutral, non-emotional state underestimates the influence that a *hot* emotional or visceral state will have on their behaviour or the behaviour of others (Loewenstein, 1996). This phenomenon has been found to occur across a wide variety visceral states, including cigarette cravings (Sayette, Loewenstein, Griffin, & Black, 2008) and end-of-life trade-offs (Stephens, Neal, & Overman, 2014).

One of the reasons why empathy gaps occur is constrained memory for affective experiences (Loewenstein, 1996). People find it hard to relive their original emotional reaction and instead rely on their immediately accessible feelings (Van Boven, Loewenstein, Dunning, & Nordgren, 2013). Empathy gaps can also be attributed to a desensitization bias, which occurs when an individual has been overexposed to the emotionally arousing situation (Ruttan, McDonnell, & Nordgren, 2015; Van Boven, Loewenstein, Dunning, & Nordgren, 2013). Individuals who have become desensitized will underestimate the intensity of their initial reaction to the situation (Van Boven et al., 2013). Ruttan and colleagues (2015) had participants read vignettes about school bullying. They found that participants who had previously endured bullying displayed more compassion towards the character who endures school bullying than the character who reacts to bullying with violent behaviour (i.e. failing to endure; Ruttan et al., 2015). Their findings contradict previous research (e.g. Batson et al., 1996) that suggests that people who have had experience with an emotional event will show greater empathy towards others experiencing the same situation.

Empathy gaps have been documented for experiences of social pain (Nordgren et al., 2011). A sample of college students played a game of *Cyberball*, a virtual boss-tossing computer programme, where they experienced either social inclusion (cold state) or exclusion (hot state). Participants in the social inclusion group consistently underestimated the painfulness of being socially excluded for both interpersonal and intrapersonal social pain (Nordgren et al., 2011). This result did not occur when participants received negative feedback that subsequently impacted their self-esteem. This strengthens their findings by suggesting that violating personal or non-social standards has different effects than violating social standards (Nordgren et al., 2011). One week after the *Cyberball* experiment, students were asked to recall their original pain estimation and only the excluded group underestimated the negativity of their initial appraisal (Nordgren et al., 2011). However, these findings are limited in that they did not account for gender differences.

Smith (2015) investigated whether empathy gaps for social pain would occur in children, specifically regarding situations of bullying. Similarly to Nordgren and colleagues (2011), she used a *Cyberball* intervention to manipulate social inclusion or exclusion. She hypothesised that estimations of social pain related to bullying would be higher in the excluded group than the included group. Due to limitations such as procedural issues, this hypothesis was not supported. Apart from this study, there is a significant gap in the literature of studies examining social pain empathy gaps occurring with children and Smith (2015) argues that more research is needed in this area.

### **Bullying**

Bullying can be defined “as aggressive, goal-directed behaviour that harms another individual within the context of a power imbalance” (Volk, Dane, & Marini, 2014, p. 2) and is a common form of social pain. There are many forms of bullying including physical or verbal harassment, relational bullying that is indirect (e.g. social ostracism), and cyberbullying, which occurs through digital devices (Olweus, 2013). The negative effects of bullying are numerous, from physical side-effects like stomach aches and insomnia to mental effects like depression (Knack, Jensen-

Campbell, & Baum, 2011) and suicide ideation (Espelage & Holt, 2013). Bullying has been found to play a major role in premeditated school shootings (Reuter-Rice, 2008).

Anti-bullying programmes have not shown much success in preventing bullying (Yeager, Fong, Lee, & Espelage, 2015). A recent meta-analysis found that bullying intervention programmes may be more effective with younger children than adolescents (Yeager et al., 2015). Researchers are calling out for more novel and theoretically grounded intervention programmes (Ingram et al., 2019; Graf et al., 2019).

Thornberg, Rosenqvist and Johansson (2012) conducted a mixed methods study to investigate adolescents' explanations of school bullying. They found that explanations were more often grounded in individualistic explanations (bully and victim crediting) than non-individualistic explanations (blaming social context; Thornberg et al., 2012).

Graf and colleagues (2019) studied the role of cognitive empathy in traditional and digital bullying through self-report measures. Their findings suggest that a person's willingness to embrace other people's perspectives is a crucial element of successful bullying intervention programmes. Other researchers have found positive results when testing bullying interventions by grounding their research in theories like social learning theory (Sapouna et al., 2010) or construal level theory (Ingram et al., 2019).

**Social learning theory.** Social learning theories (SLT; Bandura, 1986) argue that individuals learn how to cope with situations better if they can directly experience and become emotionally invested in a similar situation that requires coping. VR technology provides a way to simulate and experience these situations. Sapouna and colleagues (2010) tested a virtual learning programme called *FearNot!* on a large, cross-national sample of school children that taught bullying prevention techniques. Results indicated that the intervention was successful in increasing children's ability to avoid and prevent bullying situations (Sapouna et al., 2010). However, successful



results were only found in the UK and not the German sample of children and the effects were not long-lasting (Sapouna et al., 2010).

**Construal level theory.** Construal level theory (CLT; Liberman & Trope, 1998) postulates that an individual's mental representations of events are determined by psychological distance, for example, temporal distance (present vs future). Events that are perceived as psychologically closer will have more accurate, contextualised mental representations (Liberman & Trope, 1998). Reducing psychological distance has been found to positively increase empathy and prosocial behaviour for hypothetical situations (Lowenstein, 1996). VR can reduce psychological distance by simulating immersive environments that feel real to the user (Ingram et al., 2019). Using CLT as a framework for their study, Ingram and colleagues (2019) tested a pilot trial of a VR bullying prevention programme that enabled students to adopt the perspective of different characters involved in a bullying scenario. Results showed that the VR intervention increased empathy from pre-test to post-test, as well as other bullying prevention indicators (Ingram et al., 2019).

### **Perspective-taking**

Pioneer of the social sciences, Piaget, suggested that for children to experience empathy, they must first develop an ability to see the world from other people's points of view (Piaget & Inhelder, 1969). People with poor perspective-taking ability can sometimes have impaired social relationships. For instance, couples who do not interact with perspective-taking are less likely to be content with their relationship (Vorauer & Sucharyna, 2013).

More recently, Van Boven and colleagues' (2013) dual judgement model suggests that empathy gaps in self-judgements can generate empathy gaps in emotional perspective-taking. Accurate perspective-taking relies upon the accuracy of self-judgement. Because individuals display empathy gaps in self-judgements they will subsequently present empathy gaps when estimating the emotions of another (Van Boven et al., 2013).

Traditional perspective-taking tasks have been found to successfully increase an individual's empathy for a target (Herrera et al., 2018). Research has found that the effects of these tasks differ depending on whether an individual is imagining how another person feels in a situation (imagine-other) versus how they themselves would feel if they were in that situation (imagine-self; Batson, Early, & Salvarani, 1997). If the aim of the perspective-taking task is to increase willingness to help, using an imagine-self task may be more effective than an imagine-other exercise (Batson et al., 1997). Furthermore, gender differences have occurred in perspective-taking studies. Smith, Shepperd, Miller and Graber (2016) found female adolescents had better perspective-taking abilities than the males.

Perspective-taking tasks do not always effectively reduce the empathy gap. Empathy gaps often make negative social evaluations worse through inadequate emotional experience (Van Boven et al., 2013). However, biased evaluations may occur if the individual experiences misleading emotions. For example, simulating blindness helped participants feel what it's like to become blind but not the long-term experience of living with the disability (Silverman, Gwinn, & Van Boven, L., 2015). This resulted in the spread of misinformation and reinforced stereotypes (Silverman et al., 2015).

**Virtual perspective-taking.** VR experiences allow the user to feel like the simulated environment is real, a phenomenon known as presence (Witmer & Singer, 1998). Because empathy can be classified as understanding the perspective of another (Davis et al., 2004), researchers frequently call VR the ultimate empathy machine as it enables users to vividly experience the perspective of anyone (Herrera et al., 2018). Herrera and colleagues (2018) found that experiencing homelessness through VR produced more positive and longer lasting attitudes towards homeless people than a traditional approach. Contrastingly, McEvoy, Oyekoya, Ivory and Ivory (2016) tested the difference between bystander perspective-taking through customized VR, non-customized VR, and 2D video formats at eliciting empathy and found no significant difference between the mediums.

Knowles (2014) found a link between social pain and increased perspective-taking ability. Across three different studies, one including a virtual intervention (*Cyberball*), participants who were socially excluded or rejected and therefore experiencing social pain, presented greater perspective-taking ability than included participants (Knowles, 2014). An added strength to this study is that the researcher confirmed that the effect was not associated with the participants' attempts to evade self-awareness (Knowles, 2014).

### **The Present Study Aims and Hypotheses**

**First aim.** VR perspective-taking has been shown to increase understanding of other people's suffering more than traditional perspective-taking approaches (Herrera et al., 2018). Following this research, the first aim of the present study set out to test the effectiveness of virtual reality at increasing children's estimations of social pain by allowing them to experience the perspective of someone (victim or bystander) involved in a situation of bullying.

***Hypothesis 1:*** Estimations of social pain for bullying will be higher in the post-test after VR perspective-taking than in the pre-test for all participants.

**Second aim.** Empathy gaps have been exhibited for socially painful situations (Nordgren et al., 2011). However, there is a serious lack of research examining this phenomenon with a child sample (Smith, 2015). Bullying is a common socially painful experience and researchers (Ingram et al., 2019) have asked for more investigation into new interventions to help children understand bullying better. Therefore, the second aim of the present study was to examine the empathy gap phenomenon in children by placing students in either a hot state by being virtually bullied or a cold state of just witnessing bullying.

***Hypothesis 2:*** Participants in the victim perspective group will estimate higher scores of social pain than participants in the bystander perspective group in the post-test.

**Third aim.** Apart from a small number of studies (Eisenberger et al., 2009; Murata & Watanabe, 2017), a significant lack of research has examined gender differences in social pain. Given that gender differences have also been found in emotional perspective-taking (Smith et al., 2016), the third aim of this study investigated gender differences in children's estimations of social pain after an emotional perspective-taking task.

**Hypothesis 3:** There will be a significant difference in estimations of social pain between males and females in the pre- and post-test.

**Fourth aim.** Thornberg and colleagues (2012) have highlighted the importance of understanding children's perceptions of bullying because these perceptions have a direct effect on their actions in future bullying situations. The fourth aim of this study was to gain insight into children's explanations for victimization and uncover information that could be useful to bullying prevention programmes by administering the open-ended question, "Why do you think people get bullied?"

## Method

### Design

The present study conducted a field experiment with a mixed methods design. A within-subjects design was used to test the effect of VR perspective-taking on participants' estimations of social pain. A between-subjects design was used to test the effect of a victim's perspective versus a bystander's perspective on participants' estimations of social pain. Schools were randomly assigned into either the victim group or bystander group. Furthermore, a between-subjects design was employed to investigate gender differences in estimations of social pain in the pre- and post-test. A qualitative question was included in the final part of this study. Mixed methods designs have been shown to increase the validity of the findings and provide a more thorough understanding of the topic (Kelle, 2006), in this case children's attitudes towards bullying.

### Participants

Convenience sampling was employed and schools were contacted via email with information sheets for the principal, parents, and students (see Appendices A, B, and C) detailing the study. Initially, 146 students with principal consent, parental consent, and child consent (see Appendices D, E, and F) in the fifth and sixth classrooms of five primary schools based in Co. Dublin were recruited. Five of the participants failed to complete both the pre- and post-test and were omitted from the study. The final sample consisted of 141 participants, 57.4% male with age ranging between 10 and 12 years old ( $M = 11.3$ ,  $SD = 0.65$ ). Socio-economic and ethnic background data were not collected. Exclusion criteria included children under 10 years and children who had certain medical conditions as outlined in the physical screening form (Appendix G).

### Materials

The materials of this study included a virtual bullying simulation titled ABC\_VR developed by the researcher and an educational-technology company called Zeeko (see Appendix H and I for letter of support and summary of video creation). ABC\_VR consists of two 360° videos, optimized for VR headset usage, that simulate an

experience of classroom bullying through the perspectives of a person who is being bullied (the victim) and a person who is watching the bullying happen (the bystander). Both videos lasted 1min 56s and 1min 54s respectively. In the scene, the victim is praised by the teacher in front of the class for doing well in a test. When the teacher must leave the classroom, three female bullies begin to verbally abuse the victim. One of the bullies crumples up her test and the other takes a picture of the victim in distress (see Figures 1, 2, 3, and 4; see Appendix J for release form). The bullying ceases once the teacher returns to the classroom and the simulation ends.

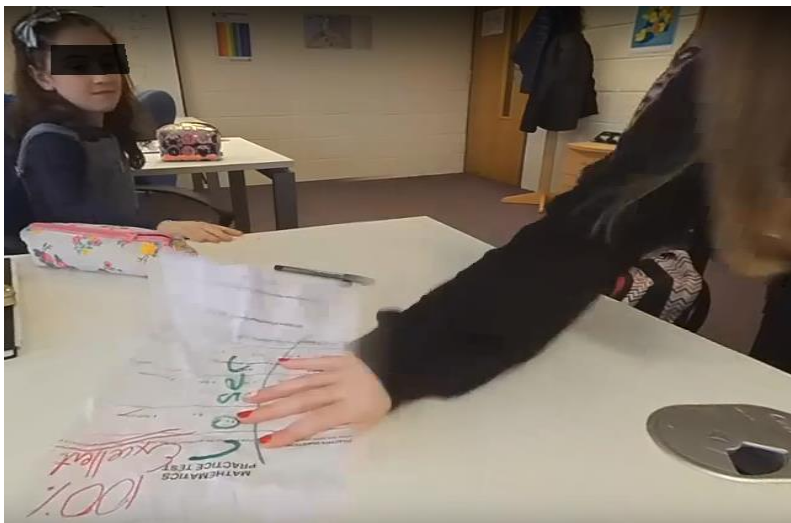


Figure 1. Screenshot from ABC\_VR of bully vandalising victim's test from victim's perspective (Zeeko, 2019).

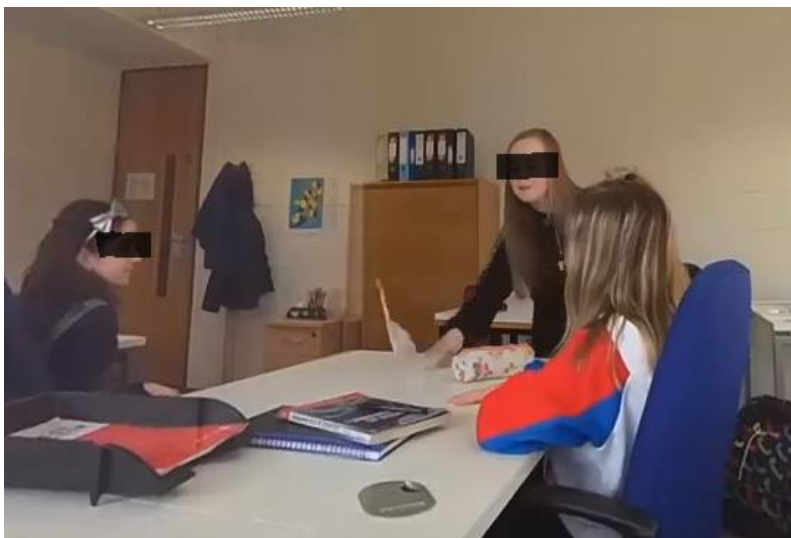


Figure 2. Screenshot from ABC\_VR of bully vandalising victim's test from bystander's perspective (Zeeko, 2019).



Figure 3. Screenshot from ABC\_VR of bully taking photograph from victim's perspective (Zeeko, 2019).



Figure 4. Screenshot from ABC\_VR of bully taking photograph from bystander's perspective (Zeeko, 2019).

Oculus Go head-mounted display headsets were used to facilitate the simulation. The Oculus Go allowed participants to watch the 360° videos in 3D monoscopic view, with parallel views of images for both eyes and built-in audio speakers (see Figures 3 and 4). These headsets were chosen because they are wireless, lightweight, do not require an external device, and the videos could be pre-loaded and watched offline (Oculus Go, n.d.).



Figure 5. Person using Oculus Go headset and controller (Wong, 2018).



Figure 6. Inside view of Oculus Go headset (Wong, 2018).

The pre-test included single-item measures assessing age and gender (see Appendix K). Students were instructed to write their favourite animal and colour on both the pre- and post-test which acted as participant indicators. The pre- and post-exposure (see Appendix L) questionnaires consisted of 2 different sets of 4 bullying vignettes. The vignettes acted as imagine-self perspective-taking tasks and depicted fictitious examples of boys and girls being bullied in different ways. These included; physical and verbal harassment, relational bullying and cyberbullying, based off of Olweus' (2013) examples of bullying. Students were instructed to read the vignettes and then indicate on the Faces of Pain Scale-Revised (FPS-R; Hicks, von Baeyer,



Spafford, van Korlaar, & Goodenough, 2001; see Appendix M) how hurt they would be if it had happened to them.

In the post-test, participants were asked to evaluate their experience: “How would you describe the experience you just had?” The question was assessed on a 10-point scale with the following 3 scale labels: 0 (*really bad*), 5 (*neither bad nor good*) and 10 (*really good*). This question was to act as a manipulation check. The post-test also included an open-ended question asking all the participants, “Why do you think people get bullied?”

The FPS-R (Hicks et al., 2001) was used as a self-report measure for social pain. The FPS-R is specifically designed for measuring pain severity in children. Pain is scored on a 0 to 10 metric. The FPS-R is a standardized scale that is considered one of the preferred scales for measuring pain (Pathak, Sharma, & Jensen, 2018). The FPS-R has been previously used to measure social pain with adults (Nordgren et al., 2011) and children (Smith, 2015).

### **Pilot Study**

A pilot study was carried out with adult participants ( $n = 4$ ) before data collection commenced to highlight any obstacles that may arise with the experimental procedure or issues with the equipment. Participants were briefed on the study and then completed the necessary forms (see Appendices N and O). The VR equipment and videos were found to run smoothly. Participants noted that the manipulation check question was confusing. They were not sure if it referred to experiencing VR (which the students might have enjoyed) or experiencing the bullying (which they might have disliked). The researcher decided to omit this question from the study.

### **Procedure**

Once ethical approval had been granted from the Department of Technology and Psychology Ethics Committee (DTPEC; see Appendix P) to carry out this research, schools were sent the pre-test in the form of an online link hosted on *surveymonkey.com* one week before the day of the experiment. They were instructed to have the participating students complete the questionnaire individually

in school. Three out of the five schools were unable to complete the online survey so they completed it in paper form on the day of the experiment.

The experiment was conducted in a spare classroom in each of the participating schools, where the researcher and an assistant set up the equipment. The experiment was conducted in groups of 13 students per group. If the participants had not already completed the pre-test online, they were instructed to carefully read and answer the questionnaire. The researcher explained to the students that they must put themselves in the shoes of the child in the story and imagine how hurt they would feel if the situation of bullying had happened to them.

After the pre-test, the researcher demonstrated how to use the headset and play the video. The researcher reminded the students first that they were about to experience a situation of bullying which can be upsetting. Secondly, they were reminded that VR can trigger some minor physical side effects, like dizziness. They were reassured that they could stop participating at any time, should they feel uncomfortable in any way. Once the students were ready, they were instructed to put on the headsets and experience either the victim or bystander perspective.

After the simulation, the participants completed the post-test. Once everyone had completed their post-tests, the researcher double-checked that all the students were not suffering physical or emotional side-effects and de-briefing sheets (see Appendix Q) were distributed.

### **Ethics**

This study did not commence until ethical approval was granted by the DTPEC. Before data was collected, informed consent was received from the participants, their parents and the principal of the participating schools, in accordance with The Psychological Society of Ireland's (2011) recommended ethical practices. There was no deception involved in this study. All participating individuals received information sheets before the study stating full details regarding the procedure, data collection, and potential emotional and physical risks. The children were reminded that grades would not be affected and that they could quit the study and remove their given

data at any time. The researcher of this study had been Garda vetted and this documentation was provided to the school (see Appendix R).

The topic of bullying is sensitive and the researcher was aware that it could trigger an emotional response in participants. A phone call with the principal of each school allowed the researcher to clarify this potential risk and advised the school to consider if there were students who may not be suitable to participate due to previous or current difficulties with bullying. After the experiment, a debriefing sheet was distributed, containing actionable insights on how to deal with bullying and information on organizations and resources available to the students.

As with all immersive media, there was a risk that participants could experience a degree of temporary cybersickness, dizziness, eye strain, headaches (Ip et al., 2018), cognitive overload, and disorientation (Cummings & Bailenson, 2016). Adverse effects of virtual reality have not been found to affect children and previous studies have shown that children experience less cybersickness compared to adults (Ip et al., 2018). However, the researcher watched out for verbal and nonverbal cues that a child was experiencing any of these symptoms. Children were seated and VR exposure did not exceed 2 minutes, which avoided the increased risk of cybersickness associated with long exposure times. Parents completed a physical screening form so that children who were susceptible to nausea, seizures or other medical conditions were excluded.

## Results

### Quantitative results

Hypothesis 1 stated that estimations of social pain would be higher in the post-test after VR perspective-taking than in the pre-test for all participants. Using SPSS (Version 25; IBM Corp., 2017), a one-tailed paired-samples t-test found a statistically significant decrease in social pain scores from the pre-test ( $M = 4.61$ ,  $SD = 2.29$ ; see Table 1) to the post-test ( $M = 4.06$ ,  $SD = 1.94$ );  $t(140) = 3.49$ ,  $p < .0005$  (one-tailed). The mean decrease in social pain scores was .54 with a 95% confidence interval ranging from .24 to .85. The eta squared statistic (.08) indicated a medium effect size. These findings suggest that exposure to a VR simulation of bullying did not increase participants' estimations of social pain severity. Therefore, hypothesis 1 was not supported.

Table 1

*Mean social pain scores for all participants in the pre- and post-test.*

Test phase	<i>n</i>	<i>M</i>	<i>SD</i>
Pre-test	141	4.61	2.29
Post-test	141	4.06	1.94

Hypothesis 2 stated that participants in the victim perspective group would estimate higher scores of social pain than participants in the bystander perspective group in the post-test. A one-tailed independent-samples t-test found no statistically significant difference between the mean scores of the victim group ( $M = 4.23$ ,  $SD = 1.79$ ; see Table 2) and the mean scores of the bystander group ( $M = 3.91$ ,  $SD = 2.07$ );  $t(139) = .97$ ,  $p > .05$  (one-tailed). The magnitude of the differences in the means (mean difference = .32, 95% CI: -.33 to .96) was very small (eta squared = .007). These results suggest that exposure to the victim's perspective did not result in higher estimations of social pain severity than the bystander perspective, thus rejecting hypothesis 2.

Table 2

*Mean social pain scores for victim group and bystander group in the post-test*

Test phase	Perspective	<i>n</i>	<i>M</i>	<i>SD</i>
Post-test	Victim	68	4.23	1.79
	Bystander	73	3.91	2.07

Hypothesis 3 predicted that there would be a significant difference in social pain scores between males and females in the pre- and post-tests. A two-tailed independent-samples t-tests found a significant difference between male ( $M = 3.9$ ,  $SD = 2.21$ ; see Table 3) and female mean scores ( $M = 5.56$ ,  $SD = 2.06$ ) in the pre-test;  $t(131.82) = 4.58$ ,  $p < .0005$  (two-tailed). The magnitude of the differences in the means (mean difference = 1.66, 95% CI: .93 to 2.38) was moderate (eta squared = .13). A significant difference was also found between male ( $M = 3.49$ ,  $SD = 1.76$ ) and female scores ( $M = 4.83$ ,  $SD = 1.92$ ) in the post-test;  $t(120.49) = 4.25$ ,  $p < .0005$  (two-tailed). The magnitude of the differences in the means (mean difference = 1.34, 95% CI: .72 to 1.96) was moderate (eta squared = .12). These results suggest the girls and boys were significantly different in their estimations of social pain severity. Therefore, hypothesis 3 was supported. Please see Appendix S for all SPSS (IBM Corp., 2017) output tables.

Table 3

*Mean social pain scores for females and males in the pre-test and post-test*

Test	Females			Males		
	<i>n</i>	<i>M</i>	<i>SD</i>	<i>n</i>	<i>M</i>	<i>SD</i>
Pre-test	60	5.56	2.06	81	3.9	2.21
Post-test	60	4.83	1.93	81	3.49	1.76

### Qualitative Results

**Data analysis.** An inductive thematic analysis was employed in order to analyse the answers to the open-ended question, “Why do you think people get bullied?” Other researchers (e.g. McEvoy et al., 2016) have utilised this form of analysis to study VR perspective-taking within the context of bullying. Thematic analysis allows the researcher to systematically identify themes within the data that relate to the

research question and then making sense of the shared meanings of the patterns (Braun & Clarke, 2012). To achieve this process, the researcher thoroughly read the data several times, identified the major patterns within the participants' responses and defined these into specific themes listed below (Braun & Clarke, 2012).

**Results.** Thematic analysis of the 125 answers to the open-ended question (13.6% did not answer) revealed several trends within the responses (see Appendix T for themes and corresponding quotes). The six major themes uncovered were jealousy, deviance, psychosocial problems, social positioning, mean personality, and personal differences (see Table 4 for percentages of participants who mentioned each main theme and subtheme).

**Jealousy.** Jealousy was mentioned by 37.6% of the students. The students frequently reasoned that people are bullied because the bully is jealous of them (28%). They referred to the bully being jealous of the victim's intelligence (5.6%), abilities (2.4%) or perceives the victim to be "better than them" (1.6%):

"Maybe because they are cleverer than some people and that makes other people get jealous."

**Deviance.** Among the reasons for why people get bullied, 28.8% mentioned deviance. Deviance refers to being different or not fitting in with everyone else. Many of the children reasoned that people get bullied because they are different (18.4%), have different characteristics (7.2%), have different interests (2.4%) or are considered outcasts (0.8%):

"For appearance, personality, religion, race or gender."

**Social positioning.** Another reason given by 9.6% of the participants was social positioning. They reasoned that victims are bullied because they are unpopular ("nerds"; 4.8%). Furthermore, people bully because they are seeking social status (2.4%), enjoy feeling powerful (0.8%) or are protecting themselves from being victimized (1.6%):

“Because some people are nerds and some people hate nerds so they bully them.”

**Psychosocial problems.** Psychosocial problems refer to problems that combine individual thoughts and behaviour with social factors (Ogden, 1995) and was mentioned in 8.8% of the answers. The students mentioned that the bully is suffering themselves and dealing with personal issues (8%). It was also noted that the bully may have previously or is currently being bullied (0.8%):

“Because bullies have their own problems and like to make others feel the same.”

**Mean personality.** 8% of participants attributed it to the personality of the bully. Students mentioned that people are bullied because bullies are mean (4%) or that they enjoy the practice of bullying (4%):

“Bullies enjoy watching people suffer.”

**Personal differences.** A small percentage (2.4%) attributed the bullying to personal differences between the victim and the bully:

“Because people hate each other.”

Table 4

*Percentage of participants who mentioned the main themes and subthemes in their open-ended answers*

Main theme	Subthemes	%
Jealousy	Jealousy in general	28
	Jealous of intelligence	5.6
	Jealous of abilities	2.4
	Victim perceived as better	1.6
	Total = 37.6	
Deviance	Victim is different	18.4
	Victim has different characteristics	7.2
	Victim has different interests	2.4
	Victim is considered an outcast	0.8
	Total = 28.8	
Social positioning	Victim is unpopular	4.8
	Bully seeks social status	2.4
	Bully fears being victimized	1.6
	Bully enjoys feeling powerful	0.8
	Total = 9.6	
Psychosocial problems	Bully is dealing with personal issues	8
	Bully has or is experiencing bullying	0.8
	Total = 8.8	
Mean personality	Bully is mean	4
	Bully enjoys bullying	4
	Total = 8	
Personal differences	Personal differences between bully and victim	2.4
	Total = 2.4	

*Note.* 4% answered "I don't know" and 0.8% reported other explanations unrelated to the main themes.



## Discussion

### Original Aims and Actual Findings

Previous research suggests that individuals must actively experience social pain to accurately understand its severity (Nordgren et al., 2011). The aim of this study was to examine whether experiencing bullying through VR would increase estimations of social pain on imagine-self perspective-taking tasks related to bullying. Hypothesis 1 stated that estimations of social pain would be higher after VR perspective-taking in the post-test than in the pre-test for all participants. This was not supported. Contrastingly, estimations of social pain severity were significantly lower in the post-VR exposure questionnaire.

The unpredicted decrease in social pain scores following the VR simulation may have been due to the novelty effect of using VR technology. The children may have been so excited about using the VR equipment, that they paid less attention to the narrative of the simulation and therefore scored lower estimations of social pain (Herrera et al., 2018). Furthermore, VR technology itself may have distracted the children. Witmer and Singer (1998) have argued that features of immersive virtual technologies like isolation, selective attention and sudden awareness of unnatural surroundings can decrease the user's ability to focus on the message being presented.

These findings are consistent with McEvoy and colleagues (2016) who found that a VR perspective-taking bullying simulation did not have the expected increasing effect on empathy or other emotions related to bystander intervention responses. However other studies have found a virtual manipulation successful at increasing social pain estimations (Nordgren et al., 2011). The results of this study are also inconsistent with Sapouna and colleagues (2010) who found that a virtual bullying intervention had a significant impact on children's anti-bullying attitudes and reducing victimization.

Hypothesis 2 predicted that participants experiencing the victim's perspective (hot state) would estimate higher scores of social pain than those experiencing the bystander's perspective (cold state). No significant difference between the group scores was found and consequently, this hypothesis was not supported. These findings are inconsistent with previous studies who have found evidence of empathy gaps related to social pain (Nordgren et al., 2011). Though insignificant, these results still contribute to the growing understanding of how children estimate pain related to socially painful situations. Studies that have successfully found evidence of empathy gaps have all used adult samples (e.g. Sayette et al., 2008; Stephens et al., 2014). Smith (2015) argues that children's appraisals of social situations may not be affected by being in a hot or cold emotional state. This effect may be something that is acquired across development.

Alternatively, the insignificant results may have been caused by procedural issues. Similarly to Smith (2015), the simulated situation of social pain in the present study may have not been severe enough to put the participants in a hot emotional state. It's also possible that there were no empathy gaps displayed due to weak identification with the victim. Nordgren and colleagues (2011) found accurate estimations of social pain were more likely to occur if the participant felt connected to the victim. The characters in the present study's simulation were of a similar age and ethnicity. The vignettes were balanced for gender and designed with Olweus' (2013) classifications for common types of bullying in mind. However, the children may have still found the characters unrelatable.

Hypothesis 3, which stated that a significant difference would be found in estimations of social pain between girls and boys before and after VR perspective-taking, was supported. On average, girls had higher scores of social pain than boys in both the pre- and post-test. The findings suggest that the girls found situations of bullying to be more socially painful than the boys. This contributes to previous literature that has found females to be more susceptible to social pain (Murata & Watanabe, 2017). For example, Eisenberger and colleagues (2009) found greater social pain-related neural activity in females. It also contributes to previous research

that has suggested that females have better perspective-taking abilities (Smith et al., 2016). The female participants in this study may have made higher estimations because they were better at taking the perspective of another.

Alternatively, the gender difference may have been affected by in-group bias. Villar and colleagues (2018) found that children rated the social pain of in-group members as higher than that of the out-group. The VR simulation depicted a female victim being antagonised by three female bullies. The girls in the present study may have identified more with the simulation, inducing a stronger emotional response, because they considered the characters as part of their in-group.

The fourth aim of this study was to gain insight into the reasons why children think people get bullied. An open-ended question was administered at the end of the post-test to all participants. A thematic analysis of the data found six key themes within the responses; jealousy, deviance, psychosocial problems, social positioning, mean personality, and personal differences. All of the themes, apart from deviance, refer to bully attributing reasons. Jealousy was the most popular attributor. Students frequently mentioned the bully being jealous because the victim is smarter or has better abilities. Psychosocial problems were another common reason given, with the children attributing bullying behaviour due to personal problems that the bully has or that the bully is also a victim. Deviance was a popular trend among reasons attributing to the victim. The children reasoned that people are bullied because they are different, for example, their looks and their interests. These themes are consistent with previous studies that have investigated children's explanations of bullying (Thornberg et al., 2012).

All these themes are individualistic explanations (bully and victim attributing) rather than non-individualistic explanations (situational). This contributes to research that has explored the social psychological phenomenon that is the fundamental attribution error (FAE; Ross, 1977). The FAE refers to the tendency for people to over-emphasise dispositional or personality-based explanations to events or behaviours and over-look situational or social factors (Thornberg et al., 2012). An

alternative explanation may be that the participants were unintentionally primed to use jealousy or deviance as explanations due to the storyline of the VR simulation where the victim is mocked for getting good results in a test.

### **Theoretical Implications**

While previous research has found a virtual intervention effective at increasing social pain estimations and displaying an empathy gap with adults (Nordgren et al., 2011), this study did not replicate similar findings with a child sample. This could be attributed to an insignificant reduction in the psychological distance in the VR environment. Reducing psychological distance has been found to increase empathy in hypothetical situations (Loewenstein, 1996) and this distance can be reduced by immersive environments according to CLT (Ingram et al., 2019). Considering this, it's possible that the children did not feel fully immersed in the VR simulation and it consequently had little impact on their appraisals of socially painful situations.

Desensitization may be another possible reason for the decrease in social pain scores after VR perspective-taking. Ruttan and colleagues (2015) have argued that individuals who have previously experienced social pain may negatively judge those who fail to endure similar pain. This suggests that the participants in the present study felt like they endured the social pain of the simulation and could therefore endure the hypothetical pain described in the imagine-self perspective-taking tasks.

It's also possible that the VR simulation did not trigger sufficient feelings of presence. SLT suggests that individuals can cope with situations better if they have directly experienced and become emotionally invested in previous similar situations (Bandura, 1986). If the children did not feel present in the simulation, they may not have felt like they directly experienced anything or become emotionally involved with the characters and their storylines, which decreased their social pain scores.

### **Practical implications**

The present study adds insight into the practical implications of VR research. The simulation used in this study lasted approximately 2 minutes, which may have not been enough time for the participants to experience presence. Previous studies have

also attributed insignificant findings (McEvoy et al., 2016) or lack of sustained effect (Sapouna et al., 2010) to a short virtual intervention. The simulation in the present study also lacked an interactive feature. Sapouna and colleagues (2010) found that actively interacting with the simulation, as opposed to just passively watching, was associated with reduced victimization in their child sample. This suggests that features like duration of virtual interventions and interactive elements need to be considered when conducting research with VR technology.

Additionally, the qualitative results of this study shed valuable insight into children's explanations for people being bullied. All of the explanations were individualistic. This information could be valuable to anti-bullying agencies or for schools when writing anti-bullying policies. A review by Hall (2017) suggested that anti-bullying policies may be more effective if the content is grounded on evidence-based research. Combining the research of the present study with previous studies could improve the quality of future bullying intervention programmes.

### **Limitations**

These findings should be interpreted with caution due to certain limitations of this study. Firstly, the present study relied on self-reported data which can be affected by social desirability bias and reference bias (Ingram et al., 2019). Secondly, there was no longitudinal feature of this study. Similarly to Ingram and colleagues (2019), this study cannot draw conclusions regarding long-term effects.

Additionally, the graphical quality of the VR simulation may have affected the results. Some of the children commented that the simulation was a little blurry. Previous studies have found that the display quality of the simulation (McEvoy et al., 2016) and instability of the software (Sapouna et al., 2010) can negatively impact a user's sense of immersion. The 360° videos in this study may have lacked the definition needed to trigger an emotional response in the children.

The design of this study is limited in that it lacked a pure control condition, similar to Herrera and colleagues' study (2018). Because this study was conducted outside of a laboratory, the researcher could not control for all intervenient

variables. The participants may have been distracted from the VR content by the classroom environment and group setting. Considering the influential role that the researcher had in the creation of the bullying simulations (see Appendix I), these findings are also subject to experimenter bias.

### **Strengths**

There are some noteworthy strengths to the present study. Firstly, a mixed methods design was employed. This increases the validity of the findings and adds greater depth to the topics discussed (Kelle, 2006), like children's explanations for bullying. Secondly, the study included a large minor population that was balanced for gender. Previous research has suggested that bullying interventions can be more affective with young children than adolescents (Yeager et al., 2015). Considering the extra ethical procedures that must be adhered to with child samples, as well as a sincere lack of studies investigating the empathy gap phenomenon with children (Smith, 2015), the age of the sample is a key strength to this study.

Additionally, the VR simulation was filmed with child actors playing the characters, as opposed to previous simulations that have used computer-generated avatars (McEvoy et al., 2016; Sapouna et al., 2010). This created a more realistic and immersive simulation, as previous studies have noted that children enjoy this feature (Ingram et al., 2019).

Furthermore, the FPS-R (Hicks et al., 2001), used to measure social pain, is a standardized scale that is widely accepted as one of the preferred measurements for estimating pain in children (Tsze, von Baeyer, Bulloch, & Dayan, 2013).

### **Future research**

Future research should replicate this study but with a larger sample size, an interactive element to the simulation and, as Ingram and colleagues (2019) suggest, compare this 3D bullying simulation with a 2D version and see if the medium of the exposure can significantly affect the results.

This study incorporated imagine-self perspective-taking tasks. Future research should compare these with imagine-other perspective-taking tasks in a similar study. Imagine-self tasks have been associated with prosocial and helping behaviours, more-so than imagine-other tasks (Batson et al., 1997). A study that compared these two types of tasks could investigate if the motivation to help was triggered by altruistic or egoistic mechanisms in the participants (Herrera et al., 2018).

Previous research suggests that users behave differently when using VR technology depending on their experience level with that technology (Bailenson & Yee, 2006). Considering that the novelty effect of VR can distract the user from the actual learning content (Herrera et al., 2018), future studies should control for the amount of previous experience that the participants have with VR.

### Conclusion

The main focus of this study was to investigate VR perspective-taking and its potential impact on children's perceptions of social pain related to bullying. It was hypothesised that the children would display an empathy gap for social pain in hypothetical bullying scenarios. Although no evidence of the empathy gap was found and the VR perspective-taking did not significantly increase social pain scores, the findings still make a contribution to the field of social pain and bullying. Girls scored significantly higher social pain scores than boys, both before and after VR exposure. This reflects previous research that has found females to be more susceptible to social pain (Eisenberger et al., 09) and have better perspective-taking ability (Smith et al., 2016).

When the children were asked reasons for why people get bullied, all respondents gave individualistic explanations. These findings suggest that children may not be aware of the non-individualistic explanations for bullying, such as group pressure or school environment (Thornberg et al., 2012). This information is particularly insightful for researchers, schools or anti-bullying agencies that might be developing new bullying prevention programmes. It might be worthwhile for these programmes to include a section that teaches children about the non-individualistic explanations of bullying so that they have a fuller understanding of the problem.

Despite the limitations of these findings, there is still vast potential for VR usage in classrooms to tackle issues like bullying. Previous studies have found that virtual technology was successful at combating bullying (Ingram et al., 2019; Sapouna et al., 2010). Although VR equipment is becoming more affordable and mainstream, it still may not be feasible given school budget restrictions and practical challenges (Ingram et al., 2019). More research is needed to evaluate the worthiness of implementing VR technology as a bullying prevention programme in schools.

In conclusion, the present study did not find evidence of the empathy gap phenomenon occurring in children's social pain estimations. However, it did shed



new light into gender differences in social pain perceptions and children's explanations for victimization.

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## **Appendices**

### *Appendix A*

#### Information sheet for principals

Hi there! My name is Deirdre Chambers. I am currently undertaking a master's degree in cyberpsychology in the Institute of Art, Design and Technology, Dún Laoighaire (IADT). As part of my master's degree, I must complete a research project, and that's what I'd like to talk to you about! This research is supported by Zeeko, an internet safety education company.

#### **Why am I conducting this research?**

Bullying has always been a problem, both in and outside of schools and it causes a lot of pain. This type of pain is known in psychology as social pain. Bullying is an issue that is commonly discussed and all schools have anti-bullying awareness built into their curriculum. I'm sure your own school has an **anti-bullying policy** in place. But still it remains a problem. Virtual reality technology is a new way of teaching kids about bullying and has proven effective in previous research.

#### **What is virtual reality and why is it useful?**

Virtual reality (VR) is a 3D artificial environment, generated by digital technology. It is an immersive experience, meaning you feel like you are actually there in the artificial environment. VR is often experienced through a headset, or goggles. Virtual technology can be useful in anti-bullying campaigns as it helps people understand the social pain of those involved in situations of bullying by placing them directly into that situation. It also breathes new life into bullying awareness education, and makes it more interesting for children who may be bored of learning about this topic.

#### **What is the aim of this research?**

People often incorrectly estimate how painful a situation of social suffering (like bullying) is. Research has shown that incorrect estimations of social pain can be corrected when people actively experience the situation for themselves. The aim of this research is to simulate a bullying experience for a child and see if that affects

how painful they estimate scenarios of bullying as being. They will perceive bullying either through the perspective of the victim, or the perspective of the bystander (onlooker).

### **What will be required of my students if I decide to let them participate?**

The experiment will go ahead in January 2019. The students will complete a questionnaire first that will ask them to read about 4 bullying scenarios. They will be asked to rate how painful they would find those situations if it happened to them. Before VR exposure, I will do a quick run through with the class, demonstrating how to use the equipment. Each child will be given their own headset. The students will be previously assigned to either the victim's simulation or the bystander's simulation. All the children will put on the headsets at the same time and be exposed to VR for the same amount of time, no longer than 2 minutes. After exposure, they will be given a sheet and asked to read about 4 bullying scenarios. Again, they will be asked to rate how painful they would find those situations if it happened to them.

### **What does the VR simulation involve?**

This simulation is taken from *ABC\_VR*, an anti-bullying programme developed by Zeeko. It will involve a classroom scene where the victim is being mocked for doing well in a test. The victim is called names like; "nerd" and "loser." The group experiencing the victim's perspective will have the bullying directed towards them. The group experiencing the bystander's perspective will just witness all this happening to the victim.

### **Is there any risk of participating?**

**Physical risks:** Please be aware that the manufacturers of the headset that will be used (Oculus Go) recommend users be of 13 years or older. There is a small risk that using the VR device may lead to some physical side effects like motion sickness, disorientation or mild eye strain. With your help, there will be medical care arrangements in place, just in case a student has a negative reaction. VR exposure will be for a maximum of 2 minutes, to reduce the likelihood of any sickness. On the

rare chance a student has a negative reaction to VR, they will be given a break and provided with some water. If a child is epileptic, particularly susceptible to motion sickness has eye problems or any other conditions that you think would make them not suitable for this study, please inform me so that they can be excluded from the study. (A second researcher will be on hand to facilitate a fun activity in a different room while the study is going on).

***Emotional risks:*** The topic of bullying can be very sensitive for some children. Experiencing a bullying simulation could trigger an emotional response. If a student has had a previous negative experience with bullying, or is currently experiencing bullying, think about whether or not they should be included in this study, and please let me know if you think they should be excluded. If the student wants to be a part of a VR simulation, but not experience bullying, we can facilitate that by giving them a headset with a relaxing type of simulation e.g. walking through a peaceful meadow. A leaflet containing tips on how to deal with bullying, as well as local resources available to the students, will be distributed at the end of the experiment.

**How will privacy of the students be protected?**

To ensure anonymity, no identifying information, but age and gender, will be asked for. The children will be instructed to not put their name anywhere on the post-test documents. All data will be stored on a previously empty USB device. When the data is not in use, it will be stored in a secure place to ensure protection of the data. Once the research project is finally reviewed, completed and submitted to IADT, the device containing the data will be destroyed.

**Can the students withdraw from the study at any stage?**

Yes. The school and the students' involvement in this study is completely voluntary and you are welcome to withdraw from the research at any stage without providing a reason and there will be no penalty for doing so.

**Who do I talk to if I have concerns after the study is finished?**

If you have any questions, please contact myself (N00162906@student.iadt.ie) or my research supervisor Robert Griffin (robert.griffin@iadt.ie). If you would like your school to participate in this study, please fill out the attached consent form.

Thank you for your time,

Deirdre Chambers

## *Appendix B*

### Information sheet for parents

Hi there! My name is Deirdre Chambers. I am currently undertaking a master's degree in cyberpsychology in the Institute of Art, Design and Technology, Dún Laoighaire (IADT). As part of my master's degree, I must complete a research project, and that's what I'd like to talk to you about! This research is supported by Zeeko, an internet safety education company.

#### **Why am I conducting this research?**

Bullying has always been a problem, both in and outside of schools and it causes a lot of pain. This type of pain is known in psychology as social pain. Bullying is an issue that is commonly discussed and all schools have anti-bullying awareness built into their curriculum. I'm sure your child's school has an **anti-bullying policy** in place. But still it remains a problem. Virtual reality technology is a new way of teaching kids about bullying and has proven effective in previous research.

#### **What is virtual reality and why is it useful?**

Virtual reality (VR) is a 3D artificial environment, generated by digital technology. It is an immersive experience, meaning you feel like you are actually there in the artificial environment. VR is often experienced through a headset, or goggles. Virtual technology can be useful in anti-bullying campaigns as it helps people understand the social pain of those involved in situations of bullying by placing them directly into that situation. It also breathes new life into bullying awareness education, and makes it more interesting for children who may be bored of learning about this topic.

#### **What is the aim of this research?**

People often incorrectly estimate how painful a situation of social suffering (like bullying) is. Research has shown that incorrect estimations of social pain can be corrected when people actively experience the situation for themselves. The aim of this research is to simulate a bullying experience for a child and see if that affects how painful they estimate scenarios of bullying as being. They will perceive bullying

either through the perspective of the victim, or the perspective of the bystander (onlooker).

### **What will be required of my child(ren) if I let them participate?**

The experiment will go ahead in January 2019. The students will complete a questionnaire first that will ask them to read about 4 bullying scenarios. They will be asked to rate how painful they would find those situations if it happened to them. Before VR exposure, I will do a quick run through with the class, demonstrating how to use the equipment. Each child will be given their own headset. The students will be previously assigned to either the victim's simulation or the bystander's simulation. All the children will put on the headsets at the same time and be exposed to VR for the same amount of time, no longer than 2 minutes. After exposure, they will be given a sheet and asked to read about 4 bullying scenarios. Again, they will be asked to rate how painful they would find those situations if it happened to them.

### **What does the VR simulation involve?**

This simulation is taken from *ABC\_VR*, an anti-bullying programme developed by Zeeko. The simulation will involve a classroom scene where the victim is being mocked for doing well in a test. The victim is called names like; "nerd" and "loser." The group experiencing the victim's perspective will have the bullying directed towards them. The group experiencing the bystander's perspective will just witness all this happening to the victim.

### **Is there any risk of participating?**

**Physical risks:** Please be aware that the manufacturers of the headset that will be used (Oculus Go) recommend users be of 13 years or older. There is a small risk that using the VR device may lead to some physical side effects like motion sickness, disorientation or mild eye strain.. With the help of the school, there will be medical care arrangements in place, just in case a student has a negative reaction. VR exposure will be for a maximum of 2 minutes, to reduce the likelihood of any sickness. On the rare chance a student has a negative reaction to VR, they will be

given a break and provided with some water. If a child is epileptic, particularly susceptible to motion sickness has eye problems or any other conditions that you think would make them not suitable for this study, please inform me so that they can be excluded from the study. (A second researcher will be on hand to facilitate a fun activity in a different room while the study is going on).

***Emotional risks:*** The topic of bullying can be very sensitive for some children. Experiencing a bullying simulation could trigger an emotional response. If a student has had a previous negative experience with bullying, or is currently experiencing bullying, think about whether or not they should be included in this study, and please let me know if you think they should be excluded. If the student wants to be a part of a VR simulation, but not experience bullying, we can facilitate that by giving them a headset with a relaxing type of simulation e.g. walking through a peaceful meadow. A leaflet containing tips on how to deal with bullying, as well as local resources available to the students, will be distributed at the end of the experiment.

#### **How will the privacy of the children be protected?**

To ensure anonymity, no identifying information, but age and gender, will be asked for. The children will be instructed to not put their name anywhere on the post-test documents. All data will be stored on a previously empty USB device. When the data is not in use, it will be stored in a secure place to ensure protection of the data. Once the research project is finally reviewed, completed and submitted to IADT, the device containing the data will be destroyed.

#### **Can I withdraw my child(ren) from the study at any stage?**

Yes. You and your child's involvement in this study is completely voluntary and you are welcome to withdraw from the research at any stage without providing a reason and there will be no penalty for doing so.

#### **Who do I talk to if I have concerns after the study is finished?**

If you have any questions, please contact myself (N00162906@student.iadt.ie) or my research supervisor Robert Griffin (robert.griffin@iadt.ie). If you would like your child(ren) to participate in this study, please fill out the attached consent form.

Thank you for your time,

Deirdre Chambers



*Appendix C*

## Information sheet for children

Hello! My name is Deirdre and I would love to work with you and your classmates! I want to learn about bullying and one really great way to learn is to do an **experiment**. Like a scientist! Only instead of the laboratory, it's going to happen in your classroom. A company called Zeeko has kindly helped me carry out this experiment.



What are we studying?

**Bullying** is really serious thing, as I'm sure you know. People who get bullied can feel a lot of pain. Not just physical pain, like you cut your knee, but emotional pain, like feeling sad.

For this study we are going to use **virtual reality** (VR). Researchers sometimes use VR to put people in situations that they've never been in before. With VR, you put on some goggles, and next thing you know, you're in a totally different place! Everywhere you look, up, down, sideways...you are in that new place. So it's a great **tool for experiencing** things.



I would like to use VR to let you experience a bullying **simulation**. A simulation is something that's **made by a computer** but looks really **realistic**, so it makes you feel like you are really there. This simulation involves a person being bullied. There will be two groups. 1 group will experience bullying through the eyes of the **person being bullied**. The other group will experience it through the eyes of a **bystander**, or a person just watching it all happen. Everyone will get their own headset and you will wear it for about **2 minutes**. Before and after the simulation you will read 4 different stories about children being bullied. You will be asked to rate how hurt your feelings would be if you had been the person getting bullied in those stories.

Important stuff!

VR can sometimes make people feel **dizzy**, a little **sick** (like they're car-sick) or it can hurt their **eyes**. These things don't happen all the time, but they can happen. Your teacher and I will be there, so **if you did want to stop** or weren't feeling well, **that's OK** and we will help you.



Bullying happens in a lot of schools all over the world. It's a difficult thing to experience and a **sensitive subject** to talk about. It's OK if you would rather not experience the bullying in VR and it's OK if you would rather not talk about bullying in the classroom. If you would still like to try the VR goggles, we can give you something different. If you don't want to use VR at all, that's fine too!

This is **not a school test** and there are no right or wrong answers. I just want to know what you think! If you want to skip a question, that's fine. If you want to stop using the VR at any time, that's fine just let me or your teacher know. Nobody will be upset with you.

I promise to keep all your answers **100% private**. I won't tell your answers to your parents, teachers or anybody else.

Remember that your parents will have to give you permission to be in this study. But it's important for me to know what you want as well. Please fill out the **consent form** that is with this sheet and let me know if you would or would not like to be a part of this project.



Thank you so much!

---

Deirdre (Researcher)

*Appendix D*

Principal consent form

**Research project title:** Virtual perspective-taking: examining empathy gaps for children’s social pain related to bullying

After reading the **information sheet** attached with this letter, if you would like your school to participate in this research project, please sign below.

I, the undersigned principal of the school

(Name in PRINT) \_\_\_\_\_

located in (Address in PRINT)

\_\_\_\_\_  
\_\_\_\_\_

CONFIRM the participation in the above mentioned project. In addition, I allow Deirdre Chambers to contact pupils, their parents, and teachers and use the space of our school to conduct the research.

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

*Appendix E*

## Parent / guardian consent form

As the informed parent/guardian of this study, I have read the information sheet provided with this document and I understand that:

- My child's participation is voluntary and they can be withdrawn from the study at any time.
- There are slight risks involved in this study.
- My child's information and results will remain confidential and anonymous.

Please tick this box if you have read and filled out the medical history form accompanying this document.

Please indicate below if there is any other information relating to this child that the researcher should be made aware of.

---

---

Should you have any other questions regarding your child's participation on this study, please don't hesitate to contact myself (N00162906@student.iadt.ie) or my supervisor, Robert Griffin (robert.griffin@iadt.ie).

Yes, I give permission for my child to participate in this study.

No, I do not give permission for my child to participate in this study.

Name (BLOCK CAPTIALS): \_\_\_\_\_

Signature: \_\_\_\_\_

Child's Name: \_\_\_\_\_

Date: \_\_\_\_\_

*Appendix F*

## Participant consent form

Name (in capital letters): \_\_\_\_\_

Teacher's name (in capital letters): \_\_\_\_\_

Please tick the box if it is true for you:

- I have read the information sheet about this project.
- I understand that all my answers are private.
- I understand that there are some side effects to using VR, like getting dizzy or feeling sick.
- I understand that I will experience a fake bullying situation.
- I understand that we will be talking about bullying in class.
- I understand that I can stop participating in this study at any time.

Please tick the box if it is true for you:

- I want to be a part of this study.
- I don't want to be a part of this study.

Please sign your name here: \_\_\_\_\_

Date: \_\_\_\_\_

*Appendix G*

Physical screening form for child participants

Name parent / guardian (PRINT): \_\_\_\_\_

Name of child (PRINT): \_\_\_\_\_

Child D.O.B (dd/mm/yy): \_\_\_\_\_

If this child has any of the following, please tick either Yes or No:

	YES	NO
Sensitive to motion sickness?		
Prone to eye-strain / serious sight problems?		
Difficulties with balance?		
Difficulties with hearing?		
Prone to dizziness and/or nausea?		
Prone to headaches?		
Prone to seizures?		
Has epilepsy?		
Has a heart condition?		
Other conditions (please describe):		

Does this child have any psychological / neurological disorders?

\_\_\_\_\_

Would this child be particularly distressed by discussing topic of bullying?

\_\_\_\_\_

\_\_\_\_\_

Parent/Guardian signature: \_\_\_\_\_

*Appendix H*

## Letter of support and permission to use material from Zeeko



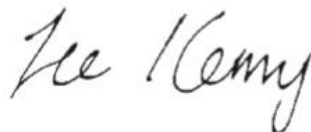
Nova UCD,  
Belfield,  
Dublin 4  
27/11/2018

Dear Sir / Madam,

This letter is to inform you that Deirdre Anne Chambers (23/05/1995) is a full-time employee of Caraglass Ltd. trading as Zeeko. Deirdre is employed as our educational content creator. Earlier this year, she assisted our head of research, Dr. Marina Everri, with exploring the educational benefits of virtual reality (to teach internet safety skills) in some primary schools in Dublin. This research involved using VR headsets with children and presenting a 30 minute self-esteem and cyberbullying awareness presentation to 5<sup>th</sup> and 6<sup>th</sup> year classes. Deirdre was excellent in providing assistance to children in the use of this kind of technology. Additionally, Deirdre was aware and prepared for any physical/emotional side effects that might occur.

We are happy to provide Deirdre with our application ABC\_VR and with VR headsets that she can use for her Cyber Psychology Research Project. We are very interested to see the results of the study.

Yours sincerely,



---

Joe Kenny  
CEO Zeeko



*Appendix I*

## Summary of ABC\_VR video creation

The researcher of the present study is currently employed by an educational-technology company called Zeeko, based in NovaUCD Research and Innovation Centre. In 2018, Zeeko tasked the researcher with the creation of the 360° bullying simulations that would be a part of ABC\_VR. Zeeko gave permission for the researcher to use these simulations as part of her research project. This allowed the researcher to create the videos with the hypotheses of the present study in mind.

Social identity theory (Tajfel, 1974) suggests that an individual's identity is heavily influenced by their in-group. The in-group is made up of the people that they identify the most with. For example, this could be people of a similar age, ethnicity or religion (Tajfel, 1974). Villar and colleagues (2018) found that children estimated higher social pain scores for pictures of people they considered to be in their in-group. With this research in mind, the ABC\_VR simulations were constructed in a way that would make it an identifiable experience for the target population; Irish primary school children above the age of 10.

The narrative was based on typical school bullying that had been reported to Zeeko by Irish primary school teachers previously. The characters in the simulation were played by Irish boys and girls aged between 10 and 13. The guardians of the children were present at all times during the filming. The guardians signed release forms that granted the researcher permission to use the videos as part of the present study (see Appendix J).

The videos were filmed using an Insta360 Pro 360° camera. An empty office in the NovaUCD building was turned into a classroom. The researcher wrote the script and directed the children during filming. However, due to the 360° nature of the shoot, a director could not be present in the classroom during the filming. Future researchers who are looking to work with 360° equipment should be prepared for this obstacle.



The simulations are slightly limited in that the three bullies are all female. This may have affected how much the male participants of the present study identified with the characters. Researchers who are interested in re-creating a similar to ABC\_VR should aim for a more gender balanced format.

Links to the 360° videos can be found here:

Victim perspective: <https://www.youtube.com/watch?v=TmRvTUFiUGA>

Bystander perspective: <https://www.youtube.com/watch?v=52Y9s29r5Xk>

*Appendix J*

Parental Consent Form for Recording of Minor Participants

**Project title:** ABC\_VR 360 video

**Co-Ordinator:** Deirdre Chambers, Content Creator, Zeeko, NovaUCD; Kathy McLaughlin, Operations Manager, Zeeko, NovaUCD

**Supervisor:** Joe Kenny, C.E.O. Zeeko, NovaUCD, email: joe@zeeko.ie

***Use capital letters and sign the form:***

I, the undersigned (NAME and SURNAME of parent/guardian 1)

.....

Having the parental authority over (NAME OF THE PARTICIPANT CHILD)

.....

born the .../.../... in (City) ..... (Country) .....

and living at (Home address) .....

City ..... Post code .....

**DECLARE**

- To have been given sufficient information from Deirdre Chambers and Kathy McLaughlin on the project, especially on: (a) the request for our child to be allowed to participate in the production; (b) the use of the production as marketing material, (c) the specific procedures our child will be required to comply with; and (d) the procedures that we as parents are asked to comply with.
- That this material will be used in conjunction with Deirdre Chambers’ Masters in Cyberpsychology (IADT) Research Project.
- That our child has been given specific information from a person that is prepared to work with minor children, and in a way s/he was able to understand.

**AUTHORIZE**

- Our child to participate in filming, which consists of audio/ video recordings in Nova UCD during the year 2019.
- Pictures and videos collected of the children to be used in Deirdre Chambers' Research Project.
- The use of the collected material for promotional activities which will include distribution of the material to schools corporates and possible investors within Ireland and Europe..

**By our signature below, we as adults having the parental authority/legal guardianship of the above-named child, having read, understood and agreed with what stated above, hereby authorize our child to participate in the mentioned above project.**

NAME and SURNAME of the parent/guardian of the child .....

SIGNATURE .....

DATE: .../... /...

*Appendix K*

## Pre-test document for participants

**Part A**

Are you a (please tick): Boy  Girl  Other

How old are you? \_\_\_\_\_

What class are you in? \_\_\_\_\_

What's your favorite animal? (Remember this for the next questionnaire!)

\_\_\_\_\_

What's your favorite colour? (Remember this for the next questionnaire!)

\_\_\_\_\_

**Part B**

Bullying vignettes

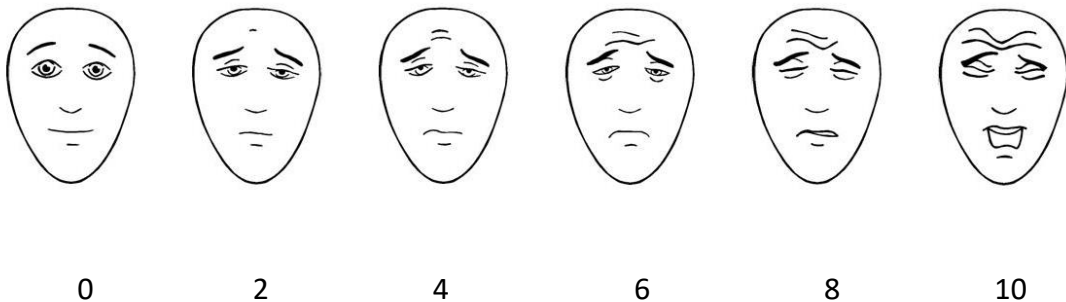
Instructions: Please read the following 4 short stories about bullying. Try to imagine this **happening to you** as you read. Think about how **you would feel**. Afterwards, please indicate on the scale of faces under each paragraph, **how much pain you would feel** or **how hurt you would be** if it had happened to you.

Remember, 0 = "no pain" and "10" = "very painful".

**PLEASE TURN THE PAGE**

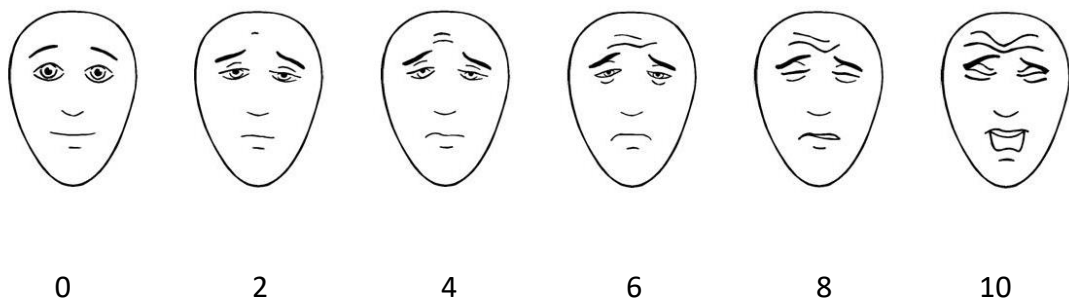
1) Jeremy is in the school hallway walking to his classroom. He stops for a moment to tie his shoes. He can hear other kids in the hallway shout; "Ew, Jeremy stinks! He smells GROSS!" As the kids walk past him, they hold their noses and say "What's that smell?" Jeremy finishes tying his shoes and walks into the classroom, trying to ignore his classmates who are all giggling.

**How hurt would you be if this happened to you?** Please circle the number that best describes this:



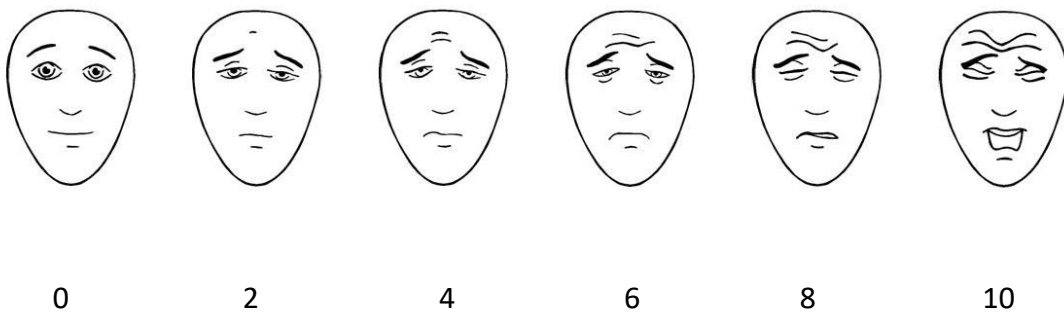
2) It is break-time and Eliza is eating her lunch. Her classmate Poppy comes over to her. Poppy is very popular in school and she has two of her best friends with her. Poppy asks Eliza for her Irish homework. "I forgot to do mine, so I need to copy yours," she says. Eliza spent a lot of time last night on her Irish and says no. Poppy picks up Eliza's lunchbox and dumps her food on the floor. She then picks up a water bottle and says "If you don't give me your homework, I'm going to dump all this water over your head!" Eliza quickly gives her the Irish homework.

**How hurt would you be if this happened to you?** Please circle the number that best describes this:



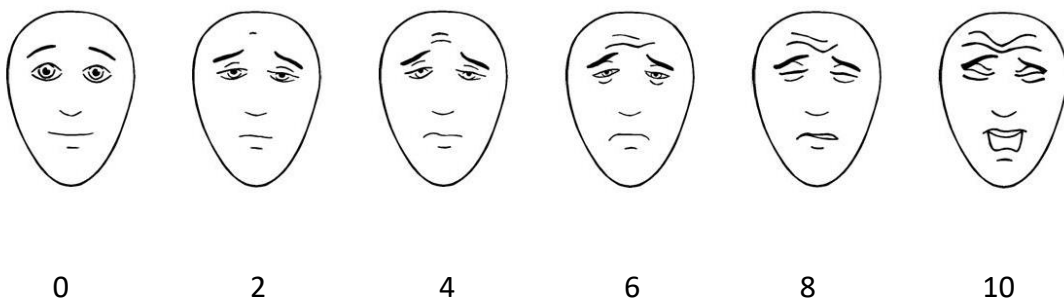
3) Ted's Mum took a photo of him and his sister and posted it on Instagram. She tagged Ted in the picture. Ted's friends have been commenting on the picture. One person wrote; "Wow Ted, who's your hot girlfriend? ;)." Another person wrote; "OMG this is the lamest pic I've ever seen!!" Another person wrote; "Eh, who still lets their Mam post pics of them, what a dork..." Ted quickly finds his Mum and asks her to take down the picture.

**How hurt would you be if this happened to you?** Please circle the number that best describes this:



4) Tina and her friend Manny are messing around after school one day. Tina starts making silly faces and Manny takes pictures of her. "These are so going on SnapChat," says Manny, "No, please don't, I look so weird!" replies Tina. Manny goes ahead and starts sending the snaps to loads of people. The next day in school, Tina overhears the other students sniggering about the photo. She finds out that the kids in the class above her have also been sent the photo.

**How hurt would you be if this happened to you?** Please circle the number that best describes this:



*Appendix L*

## Post-test document for participants

**Part A**

Are you a (please tick): Boy  Girl  Other

How old are you? \_\_\_\_\_

What class are you in? \_\_\_\_\_

What's your favorite animal? (Remember this for the next questionnaire!)

\_\_\_\_\_

What's your favorite colour? (Remember this for the next questionnaire!)

\_\_\_\_\_

**Part B**

Bullying vignettes

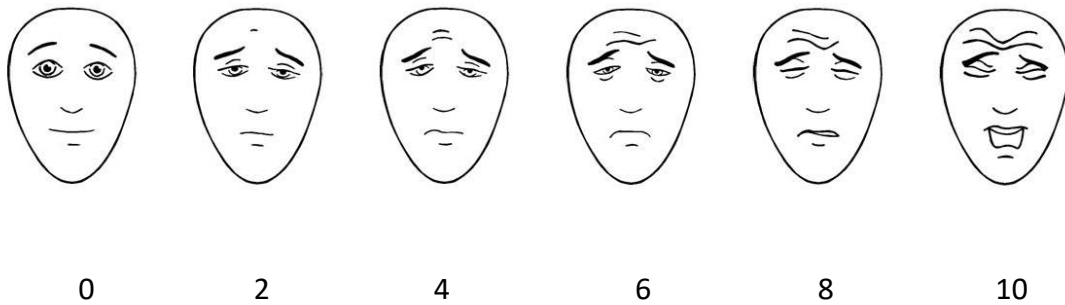
Instructions: Please read the following 4 short stories about bullying. Try to imagine this **happening to you** as you read. Think about how **you would feel**. Afterwards, please indicate on the scale of faces under each paragraph, **how much pain you would feel** or **how hurt you would be** if it had happened to you.

Remember, 0 = "no pain" and "10" = "very painful".

**PLEASE TURN THE PAGE**

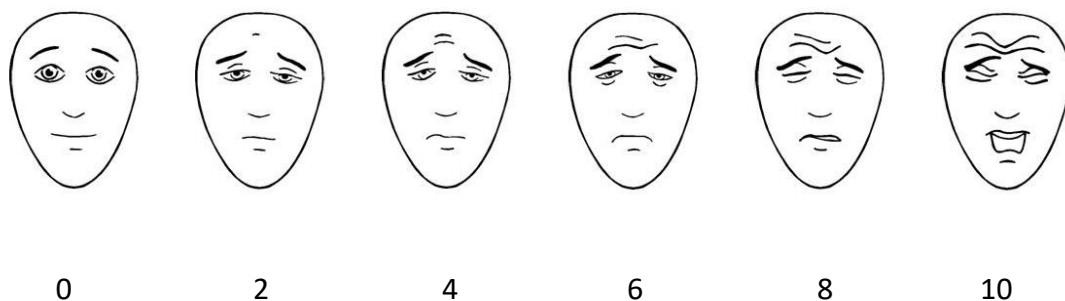
1) Lara is in the school yard. Her class mates are all chatting about a game of FortNite they were playing last night. They ask Lara if she plays FortNite. She tells them that her parents don't allow her to play video games. The other kids start teasing her and say; "Who doesn't play FortNite? That's so weird!" They tell her that she's a baby for doing what her parents tell her to do.

**How hurt would you be if this happened to you?** Please circle the number that best describes this:



2) All the boys in Phillip's class play sports and video games. But Phillip doesn't like sports and he finds video games boring. He likes baking, knitting and singing in the local choir. Because he has different interests, the other boys at school don't talk to him. They ignore him at lunch time and try not to sit beside him in class. Phillip usually eats lunch alone.

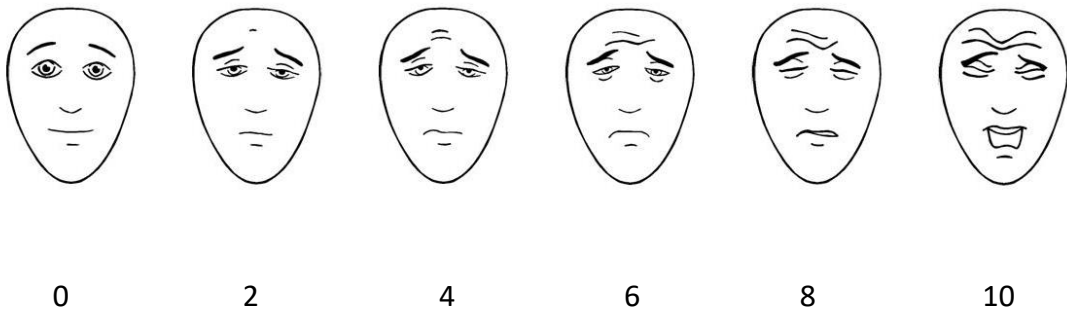
**How hurt would you be if this happened to you?** Please circle the number that best describes this:





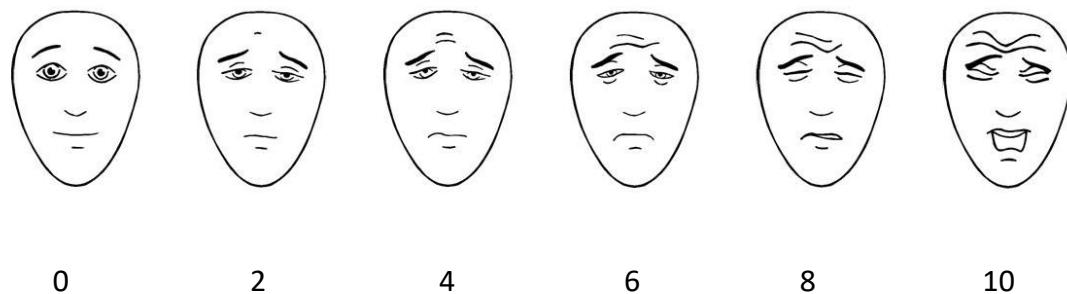
3) Zara usually takes a short cut home from school by walking down a lane near her house. Recently, a group of older students have started hanging out there after school. When Zara walks past them, they give her funny looks, whispering under their breath; "Freak." One time, one of the girls tripped her up as she walked by. Since then, Zara walks home the long way.

**How hurt would you be if this happened to you?** Please circle the number that best describes this:



4) Roger plays on the school football team. One day after practice, he overhears Trevor, the team captain, asking the other boys to come to his house for a sleepover on Saturday. They all seem really excited. Roger walks up to Trevor and asks if he can come. Trevor pushes Roger away and says; "Sorry, only people who can actually play football are invited."

**How hurt would you be if this happened to you?** Please circle the number that best describes this:



**TURN THE PAGE**

**Part C**

Please answer the following question as best you can. There are no right or wrong answers to this question. Please be as open and honest as you like.

Q: Why do you think people get bullied?

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*Appendix M*

## Faces Pain Scale-Revised (FPS-R) instructions

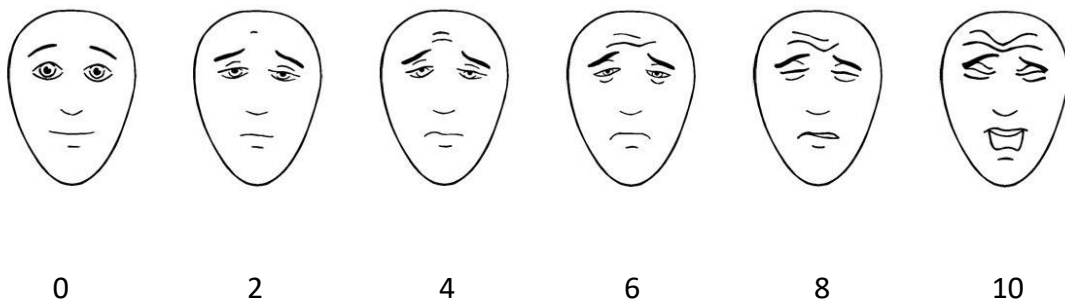
In the following instructions, say "hurt" or "pain", whichever seems right for a particular child.

"These faces show how much **something can hurt**. This face [point to face on far left] shows no pain. The faces show more and more pain [point to each from left to right] up to this one [point to face on far right] - it shows very much pain. Point to the face that shows [insert question here]."

Score the chosen face 0, 2, 4, 6, 8, or 10, counting left to right, so "0" = "no pain" and "10" = "very much pain". Do not use words like "happy" or "sad". This scale is intended to measure how children feel inside, not how their face looks.

**Permission for Use:** Copyright of the FPS-R is held by the International Association for the Study of Pain (IASP) ©2001. This material may be photocopied for non-commercial clinical, educational and research use. For reproduction of the FPS-R in a journal, book or web page, or for any commercial use of the scale, request permission from IASP online at [www.iasp-pain.org/FPS-R](http://www.iasp-pain.org/FPS-R).

**Source:** Hicks, C. L., von Baeyer, C. L., Spafford, P. A., van Korlaar, I., & Goodenough, B. (2001). The Faces Pain Scale–Revised: toward a common metric in pediatric pain measurement. *Pain*, 93(2), 173-183.



*Appendix N*

Physical screening form for adult participants

Name (PRINT): \_\_\_\_\_

D.O.B (dd/mm/yy): \_\_\_\_\_

If you have any of the following conditions, please tick either Yes or No:

	YES	NO
Sensitive to motion sickness?		
Prone to eye-strain / serious sight problems?		
Difficulties with balance?		
Difficulties with hearing?		
Prone to dizziness and/or nausea?		
Prone to headaches?		
Prone to seizures?		
Has epilepsy?		
Has a heart condition?		
Other conditions (please describe):		

Does you have any psychological / neurological disorders?

\_\_\_\_\_

Would you be particularly distressed by discussing topic of bullying?

\_\_\_\_\_

\_\_\_\_\_

Participant signature: \_\_\_\_\_

Date: \_\_\_\_\_

*Appendix O*

## Informed consent form for adult participants

As the informed participant of this study, I have read the **information sheet** provided with this document and I understand that:

- My participation is voluntary and I can withdraw from the study at any stage.
- There are slight risks involved in this study.
- My information and results will remain confidential and anonymous.

Please tick this box if you have read and filled out the physical screening form accompanying this document.

Please indicate below if there is any other information that you think the researcher should know about:

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Should you have any other questions regarding your child's participation on this study, please don't hesitate to contact myself (N00162906@student.iadt.ie) or my supervisor, Robert Griffin (robert.griffin@iadt.ie).

Yes, I agree to participate in this pilot study.

No, I do not agree to participate in this pilot study.

Name (BLOCK CAPTIALS): \_\_\_\_\_

Signature: \_\_\_\_\_

Date: \_\_\_\_\_

*Appendix P*

Letter of ethical approval from Department of Technology and Psychology Ethics  
Committee

Tue 18/12/2018 18:11

To: Deirdre Chambers <N00162906@student.iadt.ie>;

Cc: Robert Griffin <Robert.Griffin@iadt.ie>;

Your application for ethical approval for your BSc Applied Psychology Major Research Project has been approved by the Department of Technology and Psychology Ethics Committee on condition the following changes are made with your Supervisor on condition that the following changes are made with your Supervisor.

- Mention Zeeko in information sheet.
- Remove any items / questions which are non-relevant to the research aims and questions.
- Avoid colloquial phrasing.
- In tips, place "tell someone" first. Remove "ignore".
- In debrief, include written website links for parents/ guardians.
- Include National Anti-bullying centre.

We wish you the very best with your project.

Best wishes,

Sinéad Meade

Assistant Lecturer,

Department of Technology & Psychology,

Dun Laoghaire Institute of Art, Design and Technology (IADT),

Kill Avenue,

Dun Laoghaire,





Co. Dublin.

*Appendix Q*

## De-brief sheet

**Thank you** so much for taking part in this research project! I hope you had a fun experience. You have really helped me understand more about bullying and cyberbullying. I hope that you enjoyed using VR and that it is something you'd like to use again.

Bullying is something that nobody should have to deal with. So, if you are experiencing bullying, or know somebody who is, take action and find help. Here is a summary of some of the tips we discussed today on how to deal with bullies, both online and offline:

-  **Talk to somebody** – share your problem with someone older that you trust.
-  **Save texts and screenshots** – if you're getting bullied online, keep evidence so that you can show it to a parent or teacher.
-  **Stop, block, tell** – remember this if you are contacted by someone you don't know online and they are making you feel uncomfortable.
-  **Be an upstander** – if you see somebody else being bullied online or offline, think about how sad they must feel and reach out to them.

Tips for parents can be found on:

Zeeko Parent Blog has helpful tips on all things internet safety related for the whole family: <https://zeeko.ie/blog/>



The National Anti-Bullying Centre offers great support for people dealing with bullying:

<https://antibullyingcentre.ie/>



Fantastic website that with all the latest technology related advice for parents:

<https://www.common sensemedia.org/>



Here are some websites that can also help:



If you want to remove all the information you (or your child) gave to this study, that is no problem but you must email [N00162906@student.iadt.ie](mailto:N00162906@student.iadt.ie) before 1<sup>st</sup> March 2019, as this project will be submitted in mid-April 2019. For any further questions, I can be contacted on 083 843 8454 or via the email address provided. Alternatively, you can contact the Zeeko office on 0871692204.

Remember that your information is confidential and anonymous, and if published the data will not be in any way identifiable as yours.

Thank you so much again for helping me with this project! I wish you the best of luck with the remainder of your school year.

Deirdre Chambers



[www.zeeko.ie](http://www.zeeko.ie)



[ww.iadt.ie](http://ww.iadt.ie)



*Appendix R*

## Garda vetting disclosure of researcher

**An Garda Síochána**

Bíúró Náisiúnta Grinnfhiosrúcháin,  
Bóthar an Ráschúrsa,  
Durlas,  
Contae Thiobraid Árann,  
E41 RD60.

Teileafón / Tel: (0504) 27300  
Facs / Fax: (0504) 27373



National Vetting Bureau,  
Racecourse Road,  
Thurles,  
Co. Tipperary,  
E41 RD60.

Láitheán Gréasain/Web Site: [www.garda.ie](http://www.garda.ie)

Bí linn/Join us  

Luaig an uimhir tagarta B.N.G. a leanas le do thoil /  
Please quote the following N.V.B. Ref. No: **IVS001-20180129-01410**

**Nochtadh Grinnfhiosrúcháin / Vetting Disclosure**

Frank O'Brien  
Irish Vetting Services

**Maidir le / Re:** Deirdre Chambers, 23/05/1995, 5 Hyde Park Avenue, Blackrock, Dublin

De bhun d'iarratais de réir fhorálacha Alt 13 de na hAchtanna um an mBíúró Náisiúnta Grinnfhiosrúcháin (Leanaí agus Daoine Soghonta), 2012 go 2016 maidir leis an té atá ainmnithe thuas, eisítear an nochtadh grinnfhiosrúcháin leis seo duit de réir fhorálacha Alt 14 de na hAchtanna um an mBíúró Náisiúnta Grinnfhiosrúcháin (Leanaí agus Daoine Soghonta), 2012 go 2016.

Pursuant to your application within the provisions of Section 13 of the National Vetting Bureau (Children and Vulnerable Persons) Acts 2012 to 2016 in respect of the above named, the herewith vetting disclosure is issued to you within the provisions of Section 14 of the National Vetting Bureau (Children and Vulnerable Persons) Acts 2012 to 2016.

Rinneadh cuardaigh ar an / Searches were conducted on the **20/02/2018**.

**Taifead Coiriúil / Criminal Record**

Nil / Nil

**Tabhair faoi deara:** Má dhearbhaíonn an té atá ainmnithe thuas go bhfuil an taifead coiriúil seo míchruinn, ba cheart don Teagmhálaí Ainmnithe aghaidh a thabhairt ar an gceist i scríbhinn chuig an mBíúró Náisiúnta Grinnfhiosrúcháin.

**Please Note:** If the above-named asserts that this criminal record is inaccurate, the Liaison Person should address the matter in writing to the National Vetting Bureau.

**Faisnéis Shonraithe / Specified Information**

Nil / Nil

  
Sarah Meyler

**Ceannfort / Superintendent**

Seirbhísí gairmiúla póilíneachta agus slándála a sholáthar le hiontaoibh, muinín agus tacaíocht na ndaoine ar a bhfreastalaimid  
To deliver professional policing and security services with the trust, confidence and support of the people we serve

*Appendix S*

SPSS output tables

Table S1

*SPSS output data for gender*

<b>gender</b>				
		Value	Count	Percent
Valid Values	.00	female	60	42.6%
	1.00	male	81	57.4%

Table S2

*SPSS output data for age*

<b>age</b>		
		Value
N	Valid	141
	Missing	0
Central Tendency and Dispersion	Mean	11.2979
	Standard Deviation	.65186
	Percentile 25	11.0000
	Percentile 50	11.0000
	Percentile 75	12.0000

Table S3

*SPSS output data for perspective*

<b>perspective</b>				
		Value	Count	Percent
Valid Values	.00	victim	68	48.2%
	1.00	bystander	73	51.8%

Table S4

*SPSS output data for school*

<b>school</b>				
	Value	Count	Percent	
Valid Values	.00	RETNS	20	14.2%
	1.00	St J	26	18.4%
	2.00	St VDP	22	15.6%
	3.00	St M	55	39.0%
	4.00	St V	18	12.8%

Table S5

*SPSS output data for pre-test social pain mean scores*

<b>pre_mean</b>		
		Value
N	Valid	141
	Missing	0
Central Tendency and Dispersion	Mean	4.6064
	Standard Deviation	2.29114
	Percentile 25	3.0000
	Percentile 50	5.0000
	Percentile 75	6.0000

Table S6

*SPSS output data for post-test social pain mean*

<b>post_mean</b>		
		Value
N	Valid	141
	Missing	0
Central Tendency and Dispersion	Mean	4.0638
	Standard Deviation	1.93820
	Percentile 25	2.5000
	Percentile 50	4.0000
	Percentile 75	5.5000

Table S7

*SPSS output data for pre-test and post-test mean score statistics*

Paired Samples Statistics					
		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	pre_mean	4.6064	141	2.29114	.19295
	post_mean	4.0638	141	1.93820	.16323

Table S8

*SPSS output data for correlations between pre-test and post-test mean scores*

Paired Samples Correlations				
		N	Correlation	Sig.
Pair 1	pre_mean & post_mean	141	.630	.000

Table S9

*SPSS output data for pre-test and post-test mean scores paired-samples t-test*

Paired Samples Test									
		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	pre_mean - post_mean	.54255	1.84632	.15549	.23514	.84996	3.489	140	.001

Table S10

*SPSS output data for victim and bystander post-test group mean statistics*

Group Statistics					
		N	Mean	Std. Deviation	Std. Error Mean
post_mean	victim	68	4.2279	1.79018	.21709
	bystander	73	3.9110	2.06717	.24194

Table S11

*SPSS output data for victim and bystander post-test scores independent t-test*

		Independent Samples Test								
		Levene's Test for Equality of Variances			t-test for Equality of Means					
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
post_mean	Equal variances assumed	1.061	.305	.970	139	.334	.31698	.32673	-.32901	.96298
	Equal variances not assumed			.975	138.282	.331	.31698	.32506	-.32575	.95972

Table S12

*SPSS output data for female and male pre-test and post-test group mean statistics*

Group Statistics					
	gender	N	Mean	Std. Deviation	Std. Error Mean
pre_mean	female	60	5.5583	2.05866	.26577
	male	81	3.9012	2.20853	.24539
post_mean	female	60	4.8333	1.92148	.24806
	male	81	3.4938	1.75445	.19494

Table S13

*SPSS output data for female and male pre-test and post-test scores for independent t-test*

		Independent Samples Test								
		Levene's Test for Equality of Variances			t-test for Equality of Means					
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
pre_mean	Equal variances assumed	1.294	.257	4.533	139	.000	1.65710	.36556	.93432	2.37988
	Equal variances not assumed			4.581	131.821	.000	1.65710	.36173	.94154	2.37265
post_mean	Equal variances assumed	1.996	.160	4.304	139	.000	1.33951	.31123	.72415	1.95486
	Equal variances not assumed			4.246	120.485	.000	1.33951	.31549	.71488	1.96414

*Appendix T*

Example responses for the main themes and subthemes that emerged during analysis of children's explanations for victimization

Table T1

*Emergent main themes and subthemes based on analysis of open-ended answers*

Main theme	Subtheme	Example response
Jealousy	Jealousy in general	People get bullied because of jealousy.
	Jealous of intelligence	Maybe because they are cleverer than some people and that makes other people get jealous.
	Jealous of abilities	Because they are achievers.
Deviance	Victim perceived as better	People get bullied because they know the other person is better than them.
	Victim is different	I think people get bullied because theres something different about them.
	Victim has different characteristics	For appearance, personality, religion, race; gender
	Victim has different interests	Cause they like different things than everyone else.
Social positioning	Victim is considered an outcast	People are normally bullied because they are outcasts.
	Victim is unpopular	Because some people are nerds and some people hate nerds so they bully them.
	Bully seeks social status	Bullies are normally trying to [be] popular.
	Bully fears being victimized	They're afraid in case they get bullied.
Psychosocial problems	Bully enjoys feeling powerful	Because the bullies like to feel in power.
	Bully is dealing with personal issues	Because bullies have their own problems and like to make others feel the same.
Mean personality	Bully has or is experiencing bullying	Maybe because they have been bullied before and want to do it to other people.
	Bully is mean	Bullies are mean and they get all their anger out on nice people.
Personal differences	Bully enjoys bullying	Sometimes the bully might enjot hurting other people.
	Personal differences between bully and victim	Because people hate each other.
Miscellaneous		Because bullies are idiots and their minds are different and look at things differently.