CONFEDERATION OF FAMILY ORGANISATIONS IN THE EUROPEAN UNION

COFACE Paper – Cyberbullying, New dimensions through virtual environments and other emerging platforms and trends

Novelty is an elusive concept. Cyberbullying is certainly a recent phenomenon, originating from the gradual permeation of bullying behaviour into the online world as it developed, leaving us to grapple with the implications of anonymity, outreach, 24/7 connectivity, instantaneity, permanence of data... But this year, a combination of parallel evolutions in technology will bring a truly novel experience to users with the merger of social networking/online communities and virtual environments through virtual reality, with possibly new implications for cyberbullying, online harassment, privacy, and more.

Social networking, online communities or the Web 2.0 started sometime at the turn of the 21st century and expanded gradually to regroup communities with over a billion people. Online gaming communities such as World of Warcraft, League of Legends or Second Life regroup millions of users and managed to couple entertainment and online socialization/interaction. In parallel, the gradual evolution of both hardware (graphics cards, processors, screens) and software (operating systems, and graphic APIs) lead to the gradual increase in realism and quality of virtual environments, reaching levels of detail mimicking reality. Finally, virtual reality, which has been around for longer than most remember but had a very shaky history, especially with Nintendo's Virtual Boy fiasco, could finally took advantage of both of the previously mentioned evolutions to enable companies to provide a commercially viable and quality experience for end users at a relatively modest price. Indeed, virtual reality has been used by professionals for some time already, in healthcare or by the military, but with tailored and highly costly devices, unsuitable for widespread release.

So while neither virtual environments, social networking/online communities or virtual reality are, per say, new phenomena, the combination of all three is nothing short of a revolution.

This paper will be structured in three parts. The first part will brush an overview of research about the effects of virtual reality, the second part will raise a number of risks that virtual reality may pose to a phenomenon like cyberbullying, and the last part will present concluding remarks and tentative recommendations for addressing some of those risks.

The impact of virtual reality: an incomplete picture

At this stage, research on the impact of spending time in virtual reality is young, with the exception of a number of restricted "clinical" uses for virtual reality, generally designed to "help" test subjects rather than test any negative effect. Nevertheless, some side-effects of immersion into virtual reality were identified.

Helping get past a traumatic experience or solve certain mental health related issues

Virtual reality has been used for some time already to help patients with Post Traumatic Stress Disorder (PTSD). This is especially true for soldiers who have endured a traumatizing experience in combat. For instance, for soldiers who could not stand the sound of a helicopter, taking a ride in an actual helicopter helped get past the trauma. However, given the price of a helicopter ride, generalizing this to all soldiers with PTSD was not an option. An alternative was found via the immersion of the patient in a virtual reality helicopter ride which had a similar effect to an actual helicopter ride (Rothbaum, et al., 1999).

Another experiment showed that virtual reality environments can help depressive patients who have trouble expressing self-compassion thus making it difficult to get out of their depressive state. By making them express compassion towards a virtual "depressed" character and then experiencing compassion given from another virtual body, it significantly reduced the severity of their depression and their self-criticism, enhancing self-compassion (Falconer, et al., 2016). Beyond "self-compassion", VR shown promise in identifying and possibly addressing issues such as Body Image Disturbance (BID) which is heavily associated with eating disorders, especially among young women. By immersing test subjects in an VR environment where they could interact with virtual characters of varying "body sizes" in a number of settings (the beach, a party…), researchers could monitor the responses of test subjects and how much they were affected by BID (Purvis, Jones, Bailey, Bailenson, & Barr Taylor, 2015).

Phobias can also be reduced using virtual reality. One experiment aimed at treating social phobia by exposing patients to twelve 50 minute sessions of relevant images in virtual reality. Results showed a significant drop in social anxiety, even 6 months after the treatment (Gebara, Barros-Neto, & Gertsenchtein, 2016). Treating phobia via VR will likely become more and more popular since it is much easier, logistically speaking, to treat patients via VR than using "real life" situations like treating spider phobia (Miloff, et al., 2016). Another example is the management of Music Performance Anxiety (MPA) for musicians. Subjecting musicians to virtual reality which simulated giving a concert in a variety of environments and audiences yielded measurable improvements in the quality of their performances and anxiety levels (Bissonnette, Dubé, Provencher, & Moreno Sala, 2016). Finally, VR has even

demonstrated its potential to treat addictions such as nicotine or drugs by placing the patient virtual situations which allow them to smoke a cigarette or experience the feeling of drugs, but psychologically, not physically (Gupta & Chadha, 2015).

Develop empathy

The University of Stanford has a dedicated research branch looking at the impact of virtual reality on human interaction. The "Virtual Human Interaction Lab" published a number of papers including several which aimed at developing empathy or more generally, understanding by placing individuals in a different "social perspective", or in other words, to enable anyone to "walk a mile in someone else's shoes". One experiment, for instance, placed the viewer in the perspective of his older self in order to encourage saving for retirement. The study showed a marked impact on the test subject's propensity to save after the experiment (Bailenson & Carstensen, 2009). This is only one example amongst many others, including feeling more empathy or understanding towards ethnic minorities, people with disability (being in a wheel chair, suffering from visual impairments etc (University, 2016).

Carrying out otherwise unethical research

Carrying out research on human reactions in delicate situations such as a violent altercation between other human beings and their propensity to intervene would be highly unethical. VR simulations can help address some of the ethical concerns and gain insight into important human behaviour such as studying the phenomenon of bystanders. One study, for instance, measured the likelihood of 40 male Arsenal supporters (an English football team) to intervene in a VR simulated violent attack against an individual. The test was meant to measure the likelihood of such fans to intervene depending on whether the victim of the assault was an Arsenal supporter or not. Unsurprisingly, the number of interventions was much higher in case the victim was also an Arsenal supporter (in-group as opposed to out-group) (Slater, et al., 2013).

Even more controversial, a study demonstrated the use of VR to help identify sex offenders or pedophiles by measuring their arousal level or "penile plethysmography" (PPG) to VR simulations featuring computer generated (child) characters. The research shows that the measurements for distinguishing the PPG of sex offenders to non-deviant males are much more accurate with the use of VR as opposed to "standard" methods (using a screen) (Renaud, et al., 2013).

Distraction from pain

In a number of studies, VR has shown a powerful distraction from pain or real world stimuli. For instance, one application is to distract overweight children from the pain/difficulty of physical exercise (Baños, et al., 2016). Using VR to distract from pain has seen many applications including dental care, surgery, burn treatment, oncology treatments for cancer patients and many more. It provides evidence that VR is immersive enough to "dull" pain signals received by the brain. This effect was well known as it is not unique to VR. "Traditional" virtual experiences on a screen have shown similar effects and gave rise to conditions such as the Nintento Wii tendonitis, where players failed to pay attention to their bodies' pain signals while playing Wii

games with repetitive motions (such as Wii tennis) (Singh, Manoharan, Moores, & Patel, 2014). VR arguably adds another "layer" of realism and "immersiveness" which provides an even stronger distraction for the brain.

Side effects

Through all of this research, some side effects were noted including disorientation and temporary loss of motor skills due to "past-pointing" (Rizzo, Schultheis, & Rothbaum, 2003), panic attacks during prolonged use (Pangburn, 2016), physical harm/injury mostly due to sudden moves while in VR and an inadequate/unsafe surrounding environment, visual discomfort (Kima, Kanea, & Banksb, 2014) going all the way to headaches and nausea (Davis, Nesbitt, & Nalivaiko, 2015), potentially enhanced occurrences of Game Transfer Phenomena (GTP) (Ortiz de Gortaria & Griffithsa, 2016)[1] and potential impact on the eyes such as seeing ghost images when closing your eyes but these occurrences are only testimonies and have yet to be substantiated by research (Crawley, 2015).

General implications

All of the research above proves one essential point: virtual reality has pushed the boundaries of realism so far that it manages to successfully trick the brain in believing a virtual environment or experience is "real", with real psychological and even physical effects (physiological reactions, production of hormones…) This has major implications for areas such as therapy and health, but also in terms of risks.
As Jeremy Bailenson from the Stanford Virtual Human Interaction Lab put it: "The brain treats virtual experience as if it's real. The same as if you saw another person in a room — the brain reacts the same way to a virtual person. […]" (Crawley, 2015).

Cyberbullying and virtual reality

Treating trauma, causing trauma: a double edged sword

Virtual reality environments have successfully shown their therapeutic effects on helping patients getting over certain traumatizing experiences, thus one can only assume that VR also has the potential of causing trauma. Some content creators in VR have already expressed their concerns, simply over "scaring" players in VR, given the increase in realism, and advocate for setting standards. Alex Schwartz, chief executive of maker Owlchemy Labs commented that "scares in VR are borderline immoral" (Nicas, 2016).

Others, such as Richard Marks, a Sony lead virtual-reality engineer take the view that "Just like any medium, [virtual reality] can have good effects and negative effects. I think people can get just as immersed in a book." (Nicas, 2016).

Besides trauma from in-game programmed content, bullying in online gaming can also have a profound impact on a victim, given the increased feeling of "presence".

[1] Game Transfer Phenomena is the habit of taking game experiences into the real world.

To give concrete examples, some online players intentionally restrict your field of view. As annoying as that may be on a computer monitor, in a VR setting, such an action could have a similar impact as someone invading your private space in real life. To go even further, online games often include pre-programmed "taunts" to "spice up" the game[2]. In VR, in order to increase the sense of "presence", the controllers held in each hand serve also to move the characters' arms, which means players will have a much higher degree of freedom to communicate via gestures with other players. Such gestures can simply be signals to move closer or away during a team based multiplayer game, but also to mimic all sorts of obscene gestures or actions such as physical violence or sexual harassment (masturbation, coitus…).

Violence and sexual harassment against women in VR is a serious concern. Sexual harassment is an already well known and widespread phenomenon in online gaming (Williams, 2016). Women are exposed to death and rape threats, extremely offensive language (in both written and spoken form), and demands for sharing sexually explicit content or favors. A VR environment will add a further layer of "realism" to these occurrences.

It is nearly inevitable that eventually, content which simulates rape or murder will be made available on VR. Such content have already been developed by third party individuals in the form of "add-ons" or "mods" for games like Grand Theft Auto (Hernandez, 2014) and there is every reason to believe that it will come to VR as well. Palmer Luckey, the founder of the Oculus Rift, acknowledged that "it's impossible to control those kinds of things. You just have to accept it." (Grubb, 2016).

And harassment is not limited to video games. Social networks such as Twitter have a long standing reputation of poorly handling harassment and abuse of women (WAM!, 2015). This is due, according to Women, Action and the Media study, to many factors including anonymity (with low accountability for one's actions) and poor reporting mechanisms. Transposing this situation to VR environments might also have an even stronger impact on women.

A further reason to worry is the development of products aiming at increasing the realism of VR. Several companies are testing "haptic suits" which simulate the sense of "touch" in VR essentially via electrodes stimulating muscles. The Tesla Suit, for instance, not only provides a full suit simulating touch but also the feeling of warmth and coolness (Studios, 2016). The "Impacto project" tries to simulate the effect of a physical "impact" through its own Electric Muscle Simulation (EMS) technology (McAdory, 2015). Finally, a great number of companies are working on treadmills like the Omni from the company Virtuix (Virtuix, 2016) specifically designed to enable users to walk in a VR environment or even build/adapt spaces for a fully immersive VR experience (a sort of laser tag game combined with VR) (VirtualRealityReporter, 2016).

In terms of cyberbullying, such technologies could prove to be not only traumatizing but even dangerous. Think about an online game where several players "gang up" on another and decide to shoot him/her continuously. If the victim is wearing a "haptic

[2] For instance, in League of Legends, players can make their characters dance or say defiant sentences… https://www.youtube.com/watch?v=WFy-E_zaMf0

suit", he/she will "feel" every blow and depending on how the game and the suit are configured, this could even physically hurt!

No doubt that extremely graphical violence and or sexual assault in VR, potentially enhanced with haptic feedback, will spark again the long standing debate over the impact on "real life" behaviour, empathy etc (Vossena, Piotrowskib, & Valkenburgb, 2016). Although the topic is "old hat" and doomsday predictions about the impact of media violence on children have been around for some time, VR achieves such levels of realism that increased (pre)caution is necessary. "So often the pitcher goes to water until it breaks".

Online empathy

Many point to the impersonal and seemingly anonymous online environment as an element of explanation for cyberbullying, since "real life" signals which should trigger empathy towards a victim aren't present. An online bully does not realize that the victim is hurt. To go even further, many cyberbullies say and do things online they would otherwise never do offline, believing their actions are shielded by anonymity and thus impunity.

Virtual reality, since it aims to create an environment which is realistic to the point that it mimics reality, could include some of the "signals" which should trigger empathy such as expressions of sadness, distress, etc. In virtual reality interactions, be it in games or social networks, individuals will be represented by avatars and, in some instances[3], by realistic virtual representations of themselves. Via technology enabling to read in real time the emotions of a person, the virtual representations will be able to adapt and display a smiling face or a sad face. The question is whether such reactions from avatars will trigger the same kind of empathy that "real life" signals do. Following the few research papers published on empathy and virtual reality, there is hope that indeed, such signals will be rightfully interpreted by individuals and thus potentially reduce cyberbullying. However, offline bullies which take their bullying online will very likely be unaffected by VR's ability to convey distress signals since these signals are already ignored offline.

Identity theft, release of private information

In the sub-section above, we mentioned the possibility to create a photo-realistic avatar in 3D for VR interactions between users, especially through social networks. The technology enabling the "digitization" and 3D modeling of a real life model is evolving fast. Open-source game engines which are widely used, such as Unity 3D, already managed such a mapping 3 years ago[4], and the hardware/software necessary to film in 3D for VR is developing fast (Papadopoulos, 2015). This will enable just about anyone to create a photo-realistic avatar for themselves usable in any VR environment – games, meetings, virtual social gatherings – and customize them according to their "taste" (take off a few pounds, hide a mole…).

[3] It is safe to assume that given Facebook's policy on using your "real name", virtual reality through a social network such as Facebook will happen through realistic avatars accurately representing individuals rather than via impersonal avatars.
[4] https://www.youtube.com/watch?v=TBZxDMfL44Q

But this also means that identify theft will be a much greater risk. A victim of cyberbullying may be "mapped" via a 3D video taken without his/her consent or even without him/her noticing, or hacked from his/her profile or videos, and a photorealistic virtual character could be created and captured doing obscene or embarrassing things in a virtual environment. Creating photorealistic scenes for humorous purposes isn't new, take the photorealistic sketches of world leaders sitting on the toilet for example (Dich & Guggeri, 2015), but with such a technique accessible to everyone and in VR no less, it could be extremely harmful as in the case of cyberbullying. Mark Zuckerberg himself, at the Facebook F8 developer conference, presented what social VR could look like, hinting at 3D mapping for creating avatars of yourself and spend time with your friends through a VR setting (Ulanoff, 2016).

This also leads us to consider the threat of releasing private information online, something known as doxing. VR environments will be spaces to interact socially with others, be it through games, virtual parties, meetings, private virtual get-togethers, but unlike in "real life" where, while making sure no one is recording, one can act foolishly or say foolish things, VR can be entirely recorded. How will humans react to this "false" sense of privacy in VR environments which will nevertheless look very real? A user could feel he/she is in a private situation (for instance, being alone in a VR room) but be visible to thousands of users observing him/her and recording their every action. This might exacerbate the risk of being "exposed" or ridiculed online by releasing "genuine" embarrassing content (as opposed to a convincingly realistic fabrication as described above). It might also fundamentally change the way we "perceive" privacy and private spaces, triggering paranoia about being observed at all times, not only online, but also offline.

Peer-pressure, societal norms, the invisible bullies

The definition of cyberbullying clearly relates to an individual or a group of individuals, the "cyberbullies", which carry out a repetitive action with the intent to hurt someone. But what about more "subtle" or invisible forms of bullying? Can peer-pressure or societal norms, under certain circumstances, become forms of bullying? For this last sub-section, we will defend that they can be, but this question deserves to be addressed in more depth.

Even though peer pressure or societal norms do not "intend" to hurt a person, the "end effect" can be very much similar to cyberbullying given the element of repetitiveness and the powerlessness of the victims which suffer from lower self-esteem, anger, sadness, depression…

Of particular significance are issues such as racism, gender roles, gender stereotypes and body image.

While many would dismiss video games as entertainment, the design, character choice, environment and scenario of a game inevitably conveys messages. Who is the "hero" of the game and what does he (or highly unlikely "she") look like? Who is the "bad guy" and what does he/she look like? Besides the issue of women character's gross under-representation in video games other than "bimbo" characters like Tomb Raider, issues around racism and ethnic representation/depiction have been widely brought up in both research (Gonzalez, 2014) and the media (Anonymous, 2015). For

instance, Arabs and Muslims have been represented as being hostile and terrorists, flattening and simplifying any form of diversity of the Arab cultures and religious identities. One research paper looks at how the western video game industry struggles at depicting a more accurate picture of the Arab world, notably through serious games (Sisler, 2008). Research has also clearly shown the link between how Arabs are represented in the media and the violence they may be subjected to in their daily lives (Saleem & Anderson, 2012). In effect, ethnic groups which are negatively depicted in the media including in virtual environments, will not only suffer directly from such depictions but will also be more exposed to violence from others including in the form of cyberbullying. Once again, VR can take the form of a "double edged sword", as research has shown that VR can be used to increase empathy towards ethnic minorities and their struggles, thus conversely, accentuate racist attitudes and preconceptions.

Gender roles, gender stereotypes and body image are also an area of concern (Dupere, 2015). Besides the violence and harassment women are subject to online (see above), the depiction of female characters in virtual environments also constitutes a form of psychological "violence" towards women. Female characters already suffer from under-representation in virtual environments (n.d., 2016), but when games offer the possibility to play with a female character, their appearance suffers from several gender stereotypes including excessive skinniness, unrealistic body proportions (huge breasts, tiny waist), sexualization (minimal body coverage, sexually explicit attitudes…) Faced with criticism, the video game industry did make notable efforts especially with characters like Lara Croft (Tomb Raider) which has gradually moved away from being a cyber-bimbo with ridiculous body proportions to a realistic female heroin (Pinchefstky, 2013). VR has shown the potential to help users accept their body image, but at the same time, could induce a new form of "virtual competition" for skinniness or sexiness via female virtual characters or even VR social network avatars. In the online virtual world "Second Life", users are free to create their "avatars", their looks, hair, eyes… With avatars becoming more and more realistic, how will women and especially young women make their avatars look like in VR social networks? Societal pressure might push female users to "trim" or "edit" their virtual selves to match societal norms or perceived peer expectations, triggering a race to the bottom (perverse contest of the most skinny, sexy avatar…) and exacerbating the problem of Body Image Disturbance, anorexia, etc.

Finally, there are many other issues which deserve just as much attention but could not be addressed properly within the scope of this paper. Many other groups suffer from their depiction in virtual environments: LGBT, people with disability… All of these groups may also end up suffering from online hatred and violence due to a "hostile" online environment, and even more so through VR. For instance, being called a "fag" or "gay" is commonplace in video games (Hollingworth, 2012) which convey hyper "masculine" values (Burrill, 2008).

Tentative conclusions and recommendations

Many of the issues that have been identified above are not new, they are either at work in some shape or form in the offline or in the "2D" online world. Virtual reality will most likely exacerbate existing problems. In that sense, we can be reassuring, since we are not dealing with challenges that we have never encountered. However, given the increased impact VR can have, both psychologically and physiologically, tackling these issues will be even more pressing if we are to maximize the benefits of VR and minimize its potential harm.

Some unknown factors do remain. Will human beings effectively behave in VR settings much like they would in the "real world" given the increased sense of realism? Or will humans be capable, after some time of use, to successfully convince the brain that what they are seeing "is not real" and thus behave differently from "real life"? In the later case, we may find that VR will no longer trigger empathy similar to real life situations which would greatly undermine human interactions in VR settings and exacerbate existing online harassment or cyberbullying issues stemming from anonymity and lack of understanding for the victim.

As Jeremy Bailenson has so eloquently put it, "I think virtual reality is like uranium: It's this really powerful thing. It can heat homes and it can destroy nations. And it's all about how we use it." (Novacic, 2015).

To finish, here are some initial recommendations which may prove useful in preventing cyberbullying or other forms of harassment in VR environments:

- **Reinforce core values** such as empathy, self-esteem, authenticity, autonomy, liberty, open-mindedness, deliberation, critical thinking, privacy, social and emotional learning through all relevant actors such as schools, content providers, service providers, families, non-governmental organizations, civil society and so forth. Setting up a "virtual" space and environment which reinforces and actively promotes such values is key in this respect and is the responsibility of private actors. This could especially impact positively issues such as body image, gender stereotypes, homophobia etc. For instance, algorithms which decide the ranking of news or posts are configured to maximize revenue and profit (showing more of what people already like, predicting what people would like to show relevant advertising). Such algorithms could easily be configured to favour certain types of content which respect/promote the values stated above and downplay "negative" content. The social experiment carried out by Facebook proves its feasibility. Of course, such "tweaking" of algorithms should be done openly in full transparency to avoid the outcry following Facebook's "manipulation" of the Newsfeed. Some might also point to the issue of "freedom of speech" which could be impeded with such an initiative, but it should be reminded that ranking content will always in a way "limit" freedom of speech, regardless of whether it is for the purpose of maximizing advertising revenue or promote certain values.

- **Promoting a socially responsible VR design** can also help prevent the occurrence of cyberbullying. Examples of socially responsible design include:
    - The set up of an adapted game play, minimizing possibilities of "trolling" or bullying. For instance, depending on how the "hit box" or "colliders" of a game are set up, players can either pass through each other or be able to block each other thus creating the possibility for "trolls" to annoy or even bully other players by blocking their path. Game play can also set rules for how "close" players can get to each other, thus minimizing the possibility, in a VR setting, for players to "invade" each others' private spaces.
    - Easy ways to pause/interrupt a VR experience if the user feels uncomfortable, without prejudice to the game.
    - Designing an efficient reporting/blocking system to minimize the damaging effects of harassment or other negative behaviour. This includes ways to deal with identify theft, doxing, and implementing a certain accountability for negative behaviour. Examples include the League of Legends (LOL) Tribunal which is composed of LOL players and is responsible for "punishing" players which have displayed negative behaviour (temporary banishment…)

- **Issuing guidance and properly informing VR users** about potential threats, safety measures, where to find more information or help should they experience a problem.

- **Ensure a proactive monitoring of VR** as it is adopted to quickly address any risks, foreseen or unforeseen, through a variety of measures (updating design, privacy, security,…) and via a wider involvement of key stakeholders such as academics, researchers, policy makers/law enforcement and civil society representatives.

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