

Online Violence against Children: When different forms of adolescents' vulnerability are expressed on the web and do generate real risks?

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Abstract. The extremely complex nature of technology-enabled offences involving violence against children increasingly requires for Law Enforcement to develop analysis strategies, from a multidisciplinary perspective. *Cyberbullying* among peers can find in Internet a key factor, facilitating the dangerous power of such crime. The online dimension of this phenomenon increases victimization, in most cases due to lack of experience; considering bullying acts like a sort of game, as well as provocation and aggressiveness by perpetrators. These are typical features of adolescence, characterized by high levels of emotional instability and ongoing development of the individual's cognitive competencies. Additionally, internet has provided child sex offenders with the opportunity to devise increasingly horrible methods and patterns to sexually exploit children, such as *online grooming*, a crime punishable under Law No. 172/2012. Furthermore, some specific forms of emotional vulnerability, such as *eating disorders*, *self-harm*, or even some "games" have found their path to the web, showing their challenging side, with amplification of individual vulnerabilities becoming group vulnerabilities, thus promoting a sense of belonging in relation to pathological aspects.

Keywords: internet, adolescence, cyberbullying, online grooming, eating disorders

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Received: 01.04.2019 – Revision: 30.04.2019– Accepted: 02.05.2019

Online Violence against Children

Since 2000 a team of psychologists has been operating within Italian Postal and Communications Police Service - a National Police Special Unit coordinating operations and strategies aimed at fighting against cybercrime. This team has been carrying out for years a criminological analysis on the data concerning Law Enforcement activity against cybercrime phenomena, such as Child Sexual Exploitation facilitated by the Internet, Cyberbullying, as well as other risky behaviours of young people online.

The *Cybercrime Analysis Unit (UACI)* is a *team* of psychologists belonging to National Police. Their work consists in combining socio-psychological competencies with Law Enforcement activities dealing with different forms of Online Child Abuse, first of all Cyberbullying and Child Sexual Exploitation.

Criminal profiling performed by psychologists consists in identifying the individual profiles of several abusers using the internet in order to share Child Abusive images. The analysis is based on real cases dealt with by Postal and Communications Police Field Units and Sections. As a result of such criminal profiling activity several training initiatives have been developed, targeted to the academic world, specifically public and private universities, as well as the Guidelines for Special Units' staff, concerning victims' rescue and protection.

UACI has been analysing and studying the phenomenon of cyberbullying, even before the Law No. 171/2017 was issued, by means of research activities carried out in cooperation with the University of Rome "La Sapienza". Department of Juvenile and Community Justice, and with Child Health Care Centres within Detention Houses.

As a result of this study and the above-mentioned inter-ministerial cooperation, the *Guidelines for a Safe Web* for parents and teachers were developed, which thereafter were included in the volume "*Violence in a click*" published by Hogrefe, and edited by Roberto Sgalla and Anna Maria Giannini, full professor of General Psychology - Faculty of Medicine & Psychology at "La Sapienza" University of Rome.

During 2018, a total number of 150 special units' officers were trained by UACI, with the purpose of standardizing learning modules and contents in view of preventing online risks for children.

UACI provides for monitoring, interpreting and analysing new forms of dangerous for children trends, constantly consulting the relevant literature in this field, in order to supplement and update the contents of awareness raising initiatives implemented by our special unit, in cooperation with public and private entities engaged in protecting children online.

Furthermore, our unit carries out the project “Formazione Assistita” “Psychological Support and Training for Child Sexual Exploitation Police Officers”. This ongoing project launched in 2009, has been providing psychological protection to special units’ officers engaged in combating online child sexual exploitation and abuse, providing them with psychological support and counselling. This project represents a good practice for the prevention of work-related stress and provided in 2018 specific training modules for the officers concerned, aimed at learning and enhancing psychological self-protection strategies, in dealing with cases of online child sexual exploitation and abuse. Specific Guidelines are currently being developed, for police officers who during their work are exposed to child sexual abusive material, both audio and video.

Introduction

Some violent dynamics assume today amazing forms in online offending behaviours. New forms of communications, the exponential development of technology along with the formidable attraction for virtual environments experienced by children and young people, represent only a few systematic elements featuring the current and changing forms of aggression against children and adolescents online.

The landscape of online risks for children has been amplified over the last 10 years, causing not only the emersion of urgent though sporadic cases, but also of those phenomena causing high social alarm, first of all cyberbullying.

Most known forms of violence against children, which have been studied by scientific world, such as child sexual exploitation and abuse, have assumed today peculiar characteristics which, due to the diffusion of new technologies require to countering such internet-facilitated crimes. We know that young victims today are at risk of undergo precocious sexualisation, even when a child is using a game app on his/her tablet, sitting on a couch at home, while mum is cooking, without any contact between the victim and the perpetrator. The booming diffusion of smartphones, increasingly fast connectivity and the massive use of social media have produced significant effects on case studies concerning child sex offending online: in the last 5 years (2013-2018), 3045 individuals have been reported to Judicial Authority by Postal and Communications Police for having perpetrated child sex offences facilitated by Information and Communication Technology; 323 individuals have been arrested and charged with such offences.

The development of new technologies allows to widen opportunities of contact between people, offering to those having sexual interest for children the opportunity to “virtually” meet with them, to have contacts and share child sexual exploitation material behind the screen of a computer, under the illusion to remain anonymous. Some adult individuals online look for, share and disseminate images depicting child sexual abuses through file sharing networks. More recently child sex offenders are hiding themselves in the darknets, where they are organized in communities pretending to be supportive. In the last year 1033 adult individuals have been, either directly or indirectly facilitating perpetration of sexual abuses on children and young people, through conversations on chatrooms, sharing illicit files and sending to children victims perverse requests of new material, thus amplifying the victims’ suffering and harm due to a global dissemination of child sexual abusive images.

Anticipation of the threshold for criminal liability in relation to child sexual abuse, provided for in our country by the Law No.172/2012 introducing the offense of online grooming, resulted until today in 1740 requests for help submitted by children, teenagers, parents and teachers. Chat conversations, messages on social media platforms, posts and hashtags in which some adult individuals, with particular charming ability, tried to solicit teenagers and children to engage in sexual conducts, to view pornographic images and to produce self-generated images and videos in intimacy, while protected by a digital screen. This is a very significant datum, since it means that in 1740 cases the Police intervention allowed to prevent a dangerous situation, stopping a very accurate psychological manipulation operated by a perverted adult with the criminal aim of exploiting children’s vulnerability.

Cyberbullying

In the same years a new phenomenon involving violent behaviour online, referred to as *cyberbullying*, started to spread and became very popular. This term involves multiple meanings, so that it seems difficult to determine its whole significance in relation to the dangerous impact on the victims, as well as on adults’ feeling of inadequacy when they face this phenomenon, and indeed they are frequently not able to handle or curb it in a timely and effective way. Additionally, cyberbullying has required Law Enforcement to carry out in a synergic way both prevention and investigative activities, allowing to identify the complex underlying aspects of this phenomenon.

Relational models among young people in the last years have been rapidly changing, achieving new objectives. Traditional meeting places, such as the wall or the square down in the street, or the sports bar, have been replaced by virtual environments, considered as the new meeting locations, such as chat communities or social media platforms, in which moral rules and inhibitory constraints almost disappeared, while emotional reactions and aggressive behaviours may be displayed more dramatically and with less self-control than in the real world. Nowadays, the internet makes possible for children and young people to do things that in the past were impossible. From an easy access to a massive volume of information, to the opportunity to express personal beliefs and thoughts in a quite total freedom (Bauman, 2016¹).

In the last years, young people have been experiencing an easy and fast “*un-intermediated*” online communication, where there is no need to mediate between different or opposite positions, you just need to post on a social media, or to send a tweet or a WhatsApp message. Such platforms give users the opportunity to select addressee and recipients of their messages, so that they are able to express themselves without negotiating the contents of their messages with others. This could lead young people to think that there is no need to confront other people directly and to explain your opinions based on your personal considerations, you just need to post or upload images to demonstrate that you “exist”.

In an interview given on 2016 to L'Espresso, an Italian newspaper, Bauman speaks about people who, due to the internet and social media, became “publishers for themselves”, being engaged in building a personal profile by means of an accurate handling of information and images which they disseminate online. With the advent of the 2.0 age, along with the diffusion of social media among internet surfers, a crucial change took place in the high-tech world, the web became a universal stage on which everybody can show a personal realistic, although built image of oneself. Each single part of an individual's image, his/her wording and vocabulary, the contents of one's daily life, all this can be selected, manipulated and controlled directly by the user, according to sophisticated selecting mechanisms, allowing even to provide for different qualities of followers to have limited access to social media contents.²

¹ From: <http://espresso.repubblica.it/visioni/cultura/2016/02/12/news/zygmunt-bauman-siamo-al-carnevale-della-democrazia-1.250232>

² On Facebook for instance, the user can divide his/her contacts into different groups/categories (e.g. co-workers, family, close friends, undesirable, etc.) and select which groups/followers will see the user's post or image on his/her profile.

As Bauman said in the mentioned interview, the internet is at the same time, a medicine against loneliness, since you feel connected with the world, and also a place where you can be “comfortably alone”, due to everybody being closed within his/her own network from which diverse people can be excluded, and what is less likeable can be removed.

Young People Awareness and New Technologies

As a result of a recent research, the report “*How much do You Share?*” (Giannini, Sgalla, Cordellieri, Bonucchi, & Torretta, 2018³) was issued, highlighting some elements supporting the concept that young people’s relationship with social media would be indissoluble on one hand, while on the other it involves real and worrying issues.

Methodology being used in conducting the above-mentioned research, allowed to make relevant changes in the daily meetings of Postal and Communications Police officers with schoolchildren, which from merely physical and mental locations – where a dialogue with Millennial generation was taking place on internet-related risks – turned into scientific laboratories where data could be collected by means of over 2000 surveys administered to children aged between 14 and 17 years, living in 10 most important Italian cities.

Real and actual cases of cyberbullying, sexting, online grooming, were changed into scenarios in which children were able to make statements about their concepts and opinions. As a result of this process, it was possible to understand which online behaviours may trigger virtual aggression, online mockery and the end of privacy on social media.

In this regard, it was valuable the high-level scientific cooperation activity performed by a team led by Ms. Anna Maria Giannini, full professor at the University “La Sapienza” of Roma, Department of Psychology, dealing and processing a massive quantity of data, collected among children in schools. Such activity allowed to understand a generation’s culture, enabling to develop and enhance specific prevention programmes. Children still seem to believe that the web is almost a no one’s land, where they in 6 cases out of 10 share images, in 2 cases out of 10 share videos and in 6 cases out of 10 share messages and posts without thinking too much about it.

Amazingly, children tend to blame victims. They think that if you accepted to take self-generated intimate pictures and then you sent them to someone

³ In *La Violenza in un clic. Itinerari di prevenzione del cyberbullismo fra adolescenti*. Firenze: Hogrefe.

you trusted in - who however shared those images with other people online - you are in any case the first responsible for the damage you will have, when those images will be irretrievably and out of any control viralized by others. Online behaviours are frequently considered as a harmless game, without any consequences. Only 36 percent of secondary school students demonstrated to properly understand that images and videos posted online have a potentially global, permanent and uncontrollable audience.

In cases of cyberbullying, concerning 7 younger children out of 10, parents are the first to seek help, while 6 older children out of 10 are seeking help from peers. Independently of the age, 5 children out of 10 refer preferably to Law Enforcement in order to obtain protection.

Relevant data collected by Law Enforcement confirm an apparently stabilized trend: reports submitted in the last 5 years to Postal Police offices have more than doubled: from 154 in 2013 to 355 in 2018, reaching thus steadily a number between 200 and 300 cases of cyberbullying concerning children. Apparently, as regards these new trends in online harassment, the effective number including unreported cases would be very high, although in the same years more than 265 children were reported to Judicial Authority for having perpetrated online harassment against peers. These are 265 cases concerning young people whose lives have been complicated, since they had to undergo criminal proceedings in courtrooms and subsequently many years of rehabilitation, in order to remedy for the harm caused to their victims. Most of the harassments, persecutions and defamations on social media involve children knowing each other in real life and in many cases sharing common experiences and locations (e.g. the same school, the same sport or recreational activities).

A particularly relevant issue is that which is commonly referred to as “sexting”, i.e. an online behaviour currently usual among young people to share sexualised images as part of a sentimental relationship. While on one hand such behaviour would be considered a natural extension of sexual exploration typical during adolescence, however on the other hand it represents a current trend which can lead anybody following it to dangerous situations. Regarding adolescents, the lack of stability in sentimental relationships, impulsiveness and rivalry between peers can change these intimate images being shared online into a potential weapon, always ready to be used against others. In many cases cyberbullying is associated to other dangerous phenomena, such as sexual extortion, ransom and so on, causing the victim to become so vulnerable and easily targeted by adult groomers seeking sexual contact online.

Spontaneous among young people behaviours, such as sharing online intimate images or videos as part of natural sexual exploration, can

however be exploited for creating intimate images collections to be shared with anyone who wants to take part into a perp walk, a cyber-revenge for betrayal or for being abandoned. About 50 children were reported to Judicial Authority for having disseminated their peers' sexualized images, an infamous and shameful offence, which usually adult child sex offenders are charged with.

Another form of prevarication related to sexuality and typical young people's explorations, consists in *virtual sexual abuses* perpetrated on social media platforms, where both adults and young people, in order to satisfy their narcissistic, misogynistic or simply malicious feelings, disseminate a victim's intimate images encouraging all the visitors of the virtual group to moral harassment and offensive sexualized insults targeted to the victim, whose personal sensitive information, such as address and phone number are disclosed associated to each video or image illegally shared and posted online. Victims are frequently not able to protect themselves in a timely way against such kind of aggression facilitated by technology. Additionally, such form of abuse although not causing any physical injury, however it hurts the victim's reputation and feelings, with equally traumatizing effects over an incalculable period of time and having a potentially infinite diffusion. In many cases reports have been submitted to the Police only when "*viralization*" of intimate images and offensive scripts had become quite uncontrollable, or when the material already reached parents' and teachers' social media profiles. When these become aware of the facts concerning their child or pupil, worried for this emergency situation submit reports to Postal and Communications Police, not without some difficulty and feeling guilty for being late in protecting the victims.

Children are very often silenced, since they are ashamed and feel themselves as losers. They regret having been too impulsive and given their intimate photo to a peer who was very pushy, and also fear punishment. As a result of all these experiences, children increasingly detach from their social networks and feel like trapped, which may lead them to self-punishment, food restrictions and deep sense of hopelessness, until non-reversible acts, such as suicide.

Other Young People's Vulnerabilities Online

The main forms of vulnerability among teenagers are finding online the opportunity of being narrated, described and frequently amplified by means of informal, but highly attractive for children networks, where they try to team up, to help each other, to stand together apparently in a perspective of

mutual enhancement, but actually opposing to therapy and healing.

Websites dedicated to anorexia and bulimia substantially reflect two typologies, which seem to meet two possibly coexisting psychological needs - on one hand, on personal blogs hosted on international platforms within free websites young girls sometimes proudly declare their anorexic condition using food blogs, personal storytelling, pseudo-scientific quotations, in support of their own food style, thus seeking global legitimation on the Internet, while - on the other hand, young boys and girls suffering from eating disorders are shifting more and more into instant messaging groups.

These groups are generally created with an approach consisting in encouraging membership to Pro-Ana and Pro-Mia groups where messages being sent regularly, continuously and repeatedly become obsessive and sometimes may lead to foster a sense of belonging to a pathological identity. A summary analysis concerning the psychological area in scientific literature, along with an insight into real cases, allowed to identify the basic reason for creating and using online environments facilitating eating disorders-related behaviours, such as anorexia and bulimia, with the exacerbation of an identity research, a claim of self-assertion, which may be even pathological, including young people's need for supportive relationships with others.

In the past, several open-source blog platforms allowed users to access them easily and resulted in several, although limited, reports submitted through the Postal and Communications Police's website: www.commissariatodips.it. In the last 3 year reports submitted by private users have drastically reduced, until zero reports in 2018. This may indicate a possible increase of private forms of communication on these issues, taking also into account the massive diffusion of mobile devices connected to the Internet among young people and children, since the age of 10-11 years.

Within these online groups the identification of members is made possible through police investigations online, allowing to identify the real users of connected devices.

This identification is crucial for Law Enforcement, in order to hear children and to start a complex work for detecting the role played by each member within a group. Due to sharing issues about vulnerability among members of such online groups, as well as to emotional instability typical in young people suffering from eating disorders, it would be difficult to discriminate within a group who could play permanently the role of leader, supporter, inspirer or simple member.

Up to now, from the investigative activity resulted that no individual

motivated by intention of manipulating the public for criminal purposes has been identified, such as for the purpose of inducing or aggravating conditions of vulnerability in other people, neither among blog administrators or social media groups, nor among users visiting websites and platforms where such groups usually operate.

As a result of the research conducted by Brotsky & Giles (2007), Ransom, La Guardia, Woody, & Boyd (2010), the key reasons for taking part in such blogs are the need of receive support and the sense of belonging. The main purposes of the girls participating to these blogs are to lose weight and to get a sense of identity (Ransom et al., 2010), mainly by means of supportive communications of emotional nature (Yeshua-Katz & Martins, 2013).

According to the research conducted by Custers & Van den Bulck (2009), most people taking part to these online blogs are adolescents, suffering from any form of eating disorder, although it would be difficult to identify a direct cause associating such disorders with membership to online groups on blogs and forums. (Harper, Sperry, & Thompson, 2008). Additionally, according to Bardone, Cone, & Cass (2006; 2007) and Jett, LaPorte, & Wanchisn (2010), visiting websites and taking part to thematic groups on eating disorders, such forums may have a negative impact on young women participating as members.

Most discussed issues on Pro-ana and Pro-mia blogs consist in advices on how to lose weight, physical exercise, hospitalisation, use of very thin models' images, and how to become increasingly thinner (Harshbarger, Ahlers Schmidt, Mayens, Mayens, & Hawkins, 2009; Norris, Boydell, Pinhas, & Katzman, 2006). Furthermore, most relevant for young girls using such forums is the aim of achieving a sense of greatness and ontological dignity, in relation to the decision of becoming very thin, which they declare online, disseminating messages and contents, such as the "Pro-ana credo".

"The 10 Ana's commandments" would be associated with other assumptions of alternative identities, which is typical in adolescence, such as the so called "self-injury emo" etc. and may be generally interpreted as a claim for freedom, which however may hide a deep resistance to change and healing.

Additionally, another specific feature, which is peculiar of childhood and adolescence (i.e. challenging games and proofs of courage) can reveal the real nature of such online environments. The so called "*social challenges*", represent one of the "relevant novelties attracting the media attention", due to the high level of risk that such behaviours may have for children and young people. Such challenging games are spreading among

young people through the “*viralization*” of videos, where they are challenging each other in performing more or less dangerous actions, in order to increase their popularity online. The most recent is the “Bird Box Challenge”, which is inspired to a movie successfully broadcasted on Netflix. This platform is crawling with amateurish movies where young people perform actions while blindfolded, involving significant risk for their own, as well as for another persons’ safety. The great number of videos depicting people engaged in reckless behaviours, posted on “Bird Box Challenge” induced one of the major Internet Service Providers, Netflix to increase public awareness, trying to stop these challenges and prevent the related risks.

A most recent and equally dangerous phenomenon, is the “Black out game” which has been associated to the death of a number of young people, both in Italy and abroad. In following practices suggested by this “game”, children have to put in place some procedures, or ask their peers to help them in implementing such actions, causing them a state of asphyxiation, until they almost lose consciousness, due to a lack of oxygen. The purpose of such dangerous conduct is to experience euphoria, once normal breathing has been restored.

Another similar challenging game, the “Kiki Challenge” was very popular during summer 2018, with a great number of videos from all around the world posted on this online platform. This platform was casually launched when a video was posted on Instagram by the American comedian Shiggy. This video included an improvised choreography based on Drake’s song refrain, the Canadian rapper of Hotline Bling: «Kiki, do you love me? Are you riding?». The video, posted with the hashtag #DoTheShiggy, was viewed six million times. The simple and amusing steps depicted in the video were replicated by many users, including celebrities and stars from American cinema and entertainment environments.

From post to repost, from hashtag to hashtag, the challenge game turned into the practice of falling out a moving car and then being filmed while dancing out of the car, thus causing a number of road accidents, which induced US and Mexican traffic police to broadcast special ads and alerts.

Among most popular challenges online the following can be mentioned: the ingestion of detergent tabs, inhalation of condoms, binge-drinking (consisting in drinking alcohol in a short time span, until self-control is lost), knockout (i.e. punching an unknown person without any reason), deodorant-challenge (consisting in spraying deodorant directly on one’s or other people’s skin, until causing severe burns), etc. Such challenges seem to find a motivation in the mere pleasure to cross the

boundaries, which is typical in young people (Steinberg, 2004), rather than in a really non-conservative or self-injuring intention. During adolescence the power of self-assertive drives, as well as the need to experience their self-determination capacity, are so strong to motivate young people to perform demonstrative actions, whose implicit message is on one hand the emancipation from emotional childhood dependency, while on the other crossing the boundaries established by adult society.

The perception of being protected, frequently experienced by adolescents, along with the sense of belonging to a group, make the phenomenon of psychological contagion very relevant and frequent in this range of age. The extension to cyberspace of socialization and different forms of youth aggregation may clarify the phenomenon of challenges, based on “*viralization*” levels, to be increasingly developed on several online platforms, on which these challenges are launched.

Recent studies in neuro-scientific area revealed that the development of human brain, associated to the capacity of prefiguring clearly the consequences of their acts, extends in late adolescence, with a more protracted in time process than we thought in the past (Powell, 2006). Such findings imply that impulsiveness and irrationality, being perceived as typical in adolescents, may be influenced by individual cognitive capacity, which may reflect a real neuropsychological still ongoing development process, leading to insufficient or inadequate levels of accuracy in the assessment of the immediate and subsequent effects of their behaviour.

As video games are concerned, it seems that some of them are worrying first of all parents engaged in the difficult task of regulating recreational dimension online. Specifically, a game named *Fortnite*, has been reported, which is supported by major online platforms (such as Android, PlayStation 4, Nintendo Switch, Xbox One, iOS, Microsoft Windows, Classic Mac OS). This game, appeared for the first time in 2017, becoming very popular among young people. The *Fortnite* game, which may be ascribed to the category of “survival” games, induces the gamer to create a group together with other participants. The purpose of this game is that of killing other crews’ members, in order to achieve predominance on a planet which is under destruction. Although this game has been designed for users over 12 years of age, it is very popular among children attending primary and secondary school. Its easy accessibility through an App and free use ensured its massive diffusion both in Italy and all over the world, thus causing some challenges in curbing its use and abuse. Furthermore, Epic Games involve a huge number of professional gamers, sponsors and fans allowing these games to become a relevant business at international level.

In the specific literature, several recent studies documented in detail the impact on children and young people of being exposed to violent images or taking part into violent video games. Anderson, Gentile and Buckley, in a study published in 2007, highlighted as children seem to undergo the most significant and deepest impact from exposure to violent video games. Their suggestibility, associated to inexperience and dynamically evolving levels of cognitive development, make children more subject to the risk of becoming familiar with aggressiveness dynamics and violent actions. However, this is merely a starting point for children's vulnerability, since the direct impact of such vulnerability would lead them to become more aggressive and, on a medium-long term, would tend to modify several cognitive aspects in the process of learning behaviours. A group of Deutsche scientists at the University in Aachen, composed of neurobiologists and psychologists led by Dr. Klaus Mathiak, stated that exposure to violent video games may produce the same brain activity as that caused by a dangerous and possibly aggressive event (Mathiak & Weber, 2006).

To support such hypothesis, the team led by Dr. Mathiak subjected 13 fierce gamers aged between 18 and 26 years to an experiment consisting in observing the gamers' brain while the game was going on, by means of an MRI brain scan. The experiment revealed how in the gamers' brain mental processes were activated, similar to those generated by human brain in response to a real aggression (Mathiak & Weber, 2006). This brain activity, similar to the real one, would produce a kind of elective habit or variable stability, leading to use aggressive thinking and behavioural patterns, with evident effects on the whole individual mental and emotional patterns. Additionally, the studies conducted by Anderson, Gentile and Buckley (2007) allowed to identify the typical factors in violent games, which may determine different levels of negative effects on gamers:

- The gamer perceives himself within the violent game, and would fight, kill or be killed.
- The more violent is the game, the easier the identification will be.
- The duration of exposure to violence when watching TV or movies, is significantly related to an increase of probability that aggressive behaviour will be showed, either physical or verbal.
- A child in particular, immediately after the exposure to a violent video, would have a significant increase of physical aggressiveness, in comparison with a child watching a non-violent movie. The same can be said for young people and university students;
- Combination of sex and violence has a significantly negative power, particularly at a short term;

- Long-term modifications consist also in the approval of physical aggressiveness rules, which thus may become shared patterns of violent behaviour;
- Exposure to violent video games is significantly related to a decrease or a lack of positive behavioural models of solidarity, aggregation and social cooperation.

However, several sectorial studies have agreed that the main impact of exposure to violent material consists in an early familiarization with aggressive conducts and dynamics. Such familiarization may generate different outputs in individuals, based on their personality and family environment. For instance, in a child living within a family promoting a warm climate of understanding, acceptance and dialogue the impact of exposure to violent material would be reduced and limited, while in a child who is already widely exposed to violence and aggressiveness as basic family dynamics, an early and long-time exposure to violent images and games may lead to an aggravation of the existing condition, and may also generate anti-social and even pathological behaviours. This results from a study of Unsworth, Devilly and Ward, published in 2007 on the journal *Psychology, Crime & Law*. This study assessed almost a hundred children, in order to determine whether levels of rage will increase in them after being exposed to a well-known violent video-game. Participants were divided into three categories, based on specific personal features in relation to aggressiveness. Exposure to this video-game, lasting about 20 minutes, produced a substantial and concerning increase in the rage levels, and this was exclusively for the category of individuals with a more aggressive personality). The relation between viewing violent images and producing violent behaviours is neither linear, nor such to indicate a direct causal relationship, however this does not reduce its negative impact on children's emotional sphere, as well as on their behaviour.

Another significant issue to be considered consists in the duration of exposure to those images and games. The negative impact of such exposure is proportional to the time spent by children in taking part to such games. A number of Deutsche sectorial studies in this field have also identified relevant physiological features related to the use of video games. Apparently, in video games users' brain, dopamine levels are higher than normal. Such condition would induce a kind of "pleasure memory", which in turn induces to increasingly repeat or extend the game time, thus generating a mental state, which is very next to a real pathological addiction to video games.

Other studies on the physiological impact of video games highlighted that taking part to violent video games may also have a negative impact on the frequency of gamers' heartbeat. Three Swedish research centres, in cooperation with Stockholm University, Uppsala University and Karolinska Institute, revealed that in individuals aged between 12 and 15 years, playing violent games, cardiovascular health rates⁴ (Heart Rate Variability, HRV) were worse than in individuals playing non-violent games (Ivarsson, Anderson, Akerstedt, & Lindblad, 2008). Based on these results, scientists assume that individuals playing violent video games would be more exposed to cardiovascular risks, due to psycho-physiological stress generating in the heart when "playing violently".

In conclusion we can state that, if the video game is only part of today's playing activities carried out by children and young people, which they cannot do without, it is up to significant adults, particularly parents and teachers, the control of contents and patterns relating to children and young people, when using new technologies. Literature in this area revealed the dangerousness of being exposed to video games in general, and specifically to those with violent content, thus providing a starting point in view of outlining the guidelines for a safe and conscious use of video games.

Video games with a violent content should therefore be designed only for teenagers and not for young children, have a limited timeframe, and provide young people with the opportunity to discuss with an adult about the use of violence towards others, so that they can neutralize the effects consisting in familiarization with, and instigation to violence, so frequently contained in them.

A more recent research has shown that children playing video games become more aggressive, hostile and violent. These effects gradually would cumulate, following a simple learning mechanism, persisting over the years, until they have an impact on cognitive mechanisms. This is confirmed by a research conducted by Iowa State University, Ames, U.S. and a research carried out by the National Institute of Education in Singapore, conducted by Gentile, Li, Khoo, Prot, & Anderson (2014). This is a huge study, since it observed the behaviour of over 3000 children both male and female, aged between 8 and 17 years, being assessed for 3 years. In June 2018, a new video-game was launched, named "Granny" and supported by the major game platforms. This video-game is free and belongs to the genre "horror". It resulted that this video-game has been downloaded by most children, even younger children, notwithstanding its horrible and gory nature. In this game the main character is a zombie-

grandmother, trying to kill her grandson who, in order to win the match, has to go out of the house, after having killed grandmother. In the game injuries and killing involve blood splatter on the display. The use of headset is required, so that the gamer may appreciate the dark background music, and eventually the noises made by the Granny. The terrifying nature of sounds, colours, actions and characters make this game inappropriate for younger children, who may be subject to negative suggestions deriving from the concept of a significant caregiving figure, such as grandmother, becoming violent.

This summary overview of the different forms assumed by violence against children through the use of new technologies, does not exhaust the quality and quantity of risks that children and young people may incur online. The ongoing evolution of the Internet services requires an effort to keep pace continuously, both in the scientific field, in order to understand the underlying dynamics for the emerging phenomena of violence, and in communication area, with the aim of preventing and countering deviant forms of single phenomena.

It is, however, quite comforting that on one hand, technological evolution seems to be not easily directed or foreseen, thus outlining future landscapes to be hardly determined. While on the other hand, we still have a powerful constant consisting in sharing common languages and directing the selection of possible containment tools. We are dealing with human phenomena in which the common nature of the individuals involved represents a real priority element towards which the study should be directed. Furthermore, it is desirable to improve knowledge, to plan strategies and identify possible solutions. Cyberbullying, online grooming and all other phenomena in this area reflect the challenge of growing up for children and young people. Their difficulty to socialize, premature sexual exploration by young people are typical features of the evolutionary phase, the peculiarities of which have been and still are today a subject matter of study and research.

Note

Paper presented at the CIRF Conference “Adolescenti e genitori disconnessi: come orientarsi nella complessità dell’era digitale” (“Adolescents and parents dis-connected: how to orientate oneself in the complexity of the digital era”) Padova, 24th November 2018.

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