



When Cyberbullying and Bullying Meet Gaming: A systemic Review of the Literature

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Abstract

Bullying is an increasingly growing concern among children and adolescents; with the technology advances, youth has found more efficient ways to inflict harm to others via cyberbullying. The media is a relentless source for blaming violent video games as the 'cause' of bullying and cyberbullying. Despite this vast amount of research in all three individual areas, namely bullying, cyberbullying, and gaming, there is little research reviewing the connections between them. This study, therefore, systematically reviews the literature exploring the interconnectedness of these areas with a specific focus on how gaming interacts with cyberbullying and bullying. In addition, it creates a model grounded in enactivism to help us identify future areas of research and develop effective cyberbullying prevention programs.

Specifically, we conducted a literature search across 40 research databases to include, but not limited to PsycINFO, ERIC, Psycarticles, Teacher Reference Center, and Computer Science Index. Grounded in enactivism, we proposed the Enactivist Model of Cyberbullying, Bullying and Gaming, which suggests that the exploration of cyberbullying and bullying in relation to gaming should be conducted in a holistic fashion rather than limiting the focus on individuals' aggressive behavior. The model also provided a framework not only to make sense of but also to present the existing literature.

Keywords: Cyberbullying; Bullying; Gaming; Enactivism; Aggression

Introduction

It is widely recognized that bullying is a serious concern in schools and beyond. With the influx of technology and ever increasing prevalence of the Internet, people have found different ways to inflict harm on others via cyberbullying. Cyberbullying has gained increased attention as evidenced in various media reports, including a video address by President Obama and the First Lady Michelle Obama denouncing cyberbullying, posted on Facebook on March 9, 2011 [1]. Many review studies exist in multiple areas of bullying to include, but not limited to bullying in the workplace [2,3], schools [4,5], peer groups [6], special education populations [7], and parent prevention programs [8]. Some review studies have begun to address cyberbullying in relationship to bullying [9,10], with increasing amounts of systematic reviews of cyberbullying [11-13].

The media is a relentless source for blaming violent digital games (hereafter gaming) as the 'cause' of bullying and cyberbullying [14,15]. Past research has focused excessively on the effects of violent video games as exemplified by some systematic review studies [16-18]. More recently, research has begun to emerge on the positive effects of gaming to include encouragement of motivation and learning enhancement, with several review studies summarizing such work [19-21]. Despite this vast amount of research in all three individual areas, namely gaming, cyberbullying, and bullying, there is little research reviewing the connections amongst all three at the same time. While we aim to bridge this gap, the focus on all three realms is too broad to do any thorough review, considering the limit of the available space. Since many studies exist reviewing bullying and cyberbullying, we narrowed our scope: 1) to systematically review the literature exploring the interconnectedness among the three domains, with a specific focus on gaming in relation to cyberbullying and bullying among children and young people, not considering the literature from adult populations; and 2) to propose a model grounded in enactivism to help us identify gaps and guide future research.

Specifically, we conducted a literature search across 40 research databases to include, but not limited to PsycINFO, ERIC, PsycARTICLES, Teacher Reference Center, and Computer Science Index, using initial key terms cyberbullying and gaming. These initial search results yielded approximately 23 articles including dissertations and books. Other key terms included games, cyberbullying, video games, and bullying. Using these additional key terms provided around 93 articles that related to individual key terms; however, only around 45 of those articles focused on a connection between games and bullying/cyberbullying. These papers comprised the basis of this literature review.

Theoretical Framework and a model

Stemming from phenomenology and biological views, enactivism is an emerging philosophical perspective. It provides a means for conceptualizing gaming, cyberbullying, and bullying. Enactivism emphasizes embodiment and embodied cognition [22]. In addition, the biological perspective stresses that all living systems are evolved from the synthesis of the interplay of their parts [23]. From the enactivist point of view, our mind, body, and environment cannot be separated. We, including our actions and beliefs, always shape and are shaped by the environment in which we reside [24]. Examining cyberbullying, therefore, demands the exploration of the interactions among components at various levels including the meso-level (e.g. cyberbullying, gaming and bullying), the macro-level (e.g. society,

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schools, culture), and the micro-level (e.g. age, beliefs, self concept). The inseparability of our mind, body, and the surroundings further suggests that cyberbullying should be examined including different perspectives, from the bodily aspect (e.g. physical states), to the mind (e.g. mental health, personality, mood), to the surroundings (e.g. education).

Grounded in the enactivist perspective, we propose the Enactivist Model of Gaming, Cyberbullying, and Bullying (EMGCB) demonstrating the complex interplay of these three research domains (Figure 1). The evolution of this model also reflects the enactivist view about cognition. The initial version of the model was inspired by the enactivist viewpoints and our previous knowledge about these research domains. After our preliminary review of the existing research papers, we contemplated on the functionality of such a model: should it be an analytical model to be presented at the beginning to provide theoretical guidance, or purely a rhetoric mechanism shared at the end of the paper to summarize the existing studies? Our iterative discussions with colleagues and reviewers as well as our further interaction with the existing literature made us decide to present the model early in this review as a device to assist readers in visualizing how several parts of

the research literature relate to one another. As a sophisticated organizer for the topics and information presented in this review, this model also serves as a heuristic device that may be useful in making sense of the existing literature and identifying gaps. The nature of this recursive and dynamic, rather than a linear and static, development process of the model truly reflects the enactivist view about thinking. In fact, we expect that the model will continue to evolve that the current version of the model will guide future research, with new findings to further refine and reshape the model.

Some bullying research employs an ecological systems approach, which, at first blush, seems very similar to enactivism. We, however, argue the significance of our model based on enactivism for two important reasons: first, as convincingly argued by many scholars [25,26], enactivism is different from ecological systems perspectives, though these two viewpoints share some assumptions. Secondly, a unique aspect that differentiates this review from any other literature on cyberbullying/bullying lies in the intersection of gaming and cyberbullying/bullying. Our review therefore goes beyond the existing cyberbullying/bullying literature and the EMGCB model adds to our current understanding of the field.

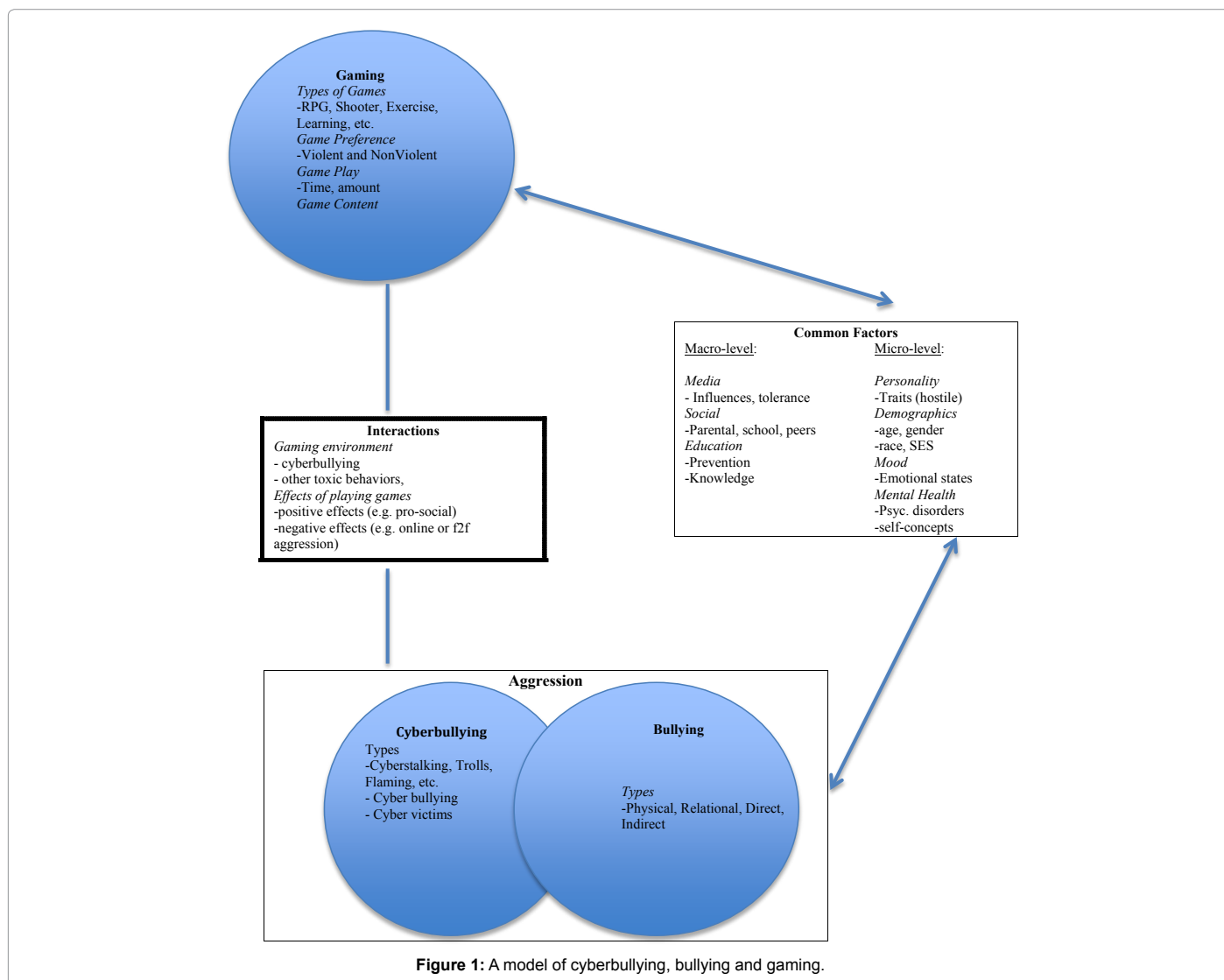


Figure 1: A model of cyberbullying, bullying and gaming.

In this model, gaming, cyberbullying, and bullying, are meso-level categories that are presented by circles. Because bullying and cyberbullying are two closely linked concepts and cyberbullying is often considered a type of bullying, the two circles overlap to reflect such strong connections. Aggression, represented by a rectangle encompassing the two circles, is an umbrella category that includes cyberbullying and bullying.

Many variables are common factors that affect gaming, cyberbullying and bullying. Grouped under Common Factors, as represented by a rectangle, these variables include both macro-level (e.g. education) and micro-level (e.g. demographic) variables. The double-headed arrows between these variables suggest the reciprocal relationships. For example, individuals' personality and educational levels can shape their gaming experience. On the other hand, people's gaming experience can change to their mood or influence their way to interact with others in the social environment.

The last category – "interactions", also the main focus of this paper, is how gaming interacts with cyberbullying and bullying, which is presented by another rectangle but with dotted lines. The interactions between the variables are generally categorized into two areas: 1) gaming environment - cyberbullying and other aggressive behaviors can very much occur in gaming environments; and 2) effects – on one hand, cyberbullying and bullying, or other types of aggression may affect players' gaming experiences. On the other hand, games, especially violent games, may contribute to aggression, including bullying and cyberbullying.

In sum, the five categories in the model reflect the state of the field in research on cyberbullying and bullying in relation to gaming. Next, we first very briefly introduce each of the four categories in the model: gaming, cyberbullying, bullying, and common factors to set the stage. The focus then shifts to the "interaction" category, discussing the relationships amongst the three domains.

Gaming

Gaming industry has grown tremendously within the past decade. A 2001 study [27] suggested that 70% of children play computer games every week, with 68% of children playing on their phones. In 2006, a US national study found 85% of children play video games at home or school, with 50% of males reporting they play every day [28]. The Pew study conducted in 2009 [29] stated that 97% of the US teens (12-17 years old) play digital games with rich gaming experience.

Many different types of games exist. [30] classified games into eight different types. The most popular games are action games (i.e., shooting) and adventure games (i.e., solving puzzles provided via narratives in order to progress through virtual worlds). Action games such as Call of Duty: Black Ops II has sold over ten million copies since its release in November 2012 [31]. Other game types include fighting games, puzzle games, sports games, strategy games, and role-playing games. Role-playing games include multiple settings where the human player assumes the role of the game character. These games are similar to simulation games; however, simulation games involve succeeding in a simplified version of an environment. Some games that do not neatly fit into one of these game type categories, and often time games may take on features from multiple categories [32].

Define games into seven categories: action/platform games, adventure games, fighting games, role-playing games, simulations, sports games, and strategy games. Again, these categories may not be mutually exclusive, meaning it is possible that one game belongs to

more than one category [33]. Although many well-publicized violent games are shooting games, it is by no means the only type of game that can contain violent elements. On the flip side, even shooting games can be used to address cyberbullying and bullying issues. For example, schools can use educational shooting games to increase students' understanding of Internet safety and awareness of the negative consequences of cyberbullying.

Cyberbullying

What is cyberbullying?

Cyberbullying has increasingly gained attention both from media and research communities. More and more people have begun to realize the significant negative impact of cyberbullying and therefore are seeking prevention and intervention strategies. A clear, appropriate and accurate definition of cyberbullying is a precursor to effectively address the cyberbullying problem. To date, many definitions exist. For example, cyberbullying can be briefly defined as "sending or posting harmful or cruel text or images using the Internet or other digital communication devices" [34]. Another widely adapted definition is:

An aggressive, intentional act carried out by a group or individual, using electronic forms of contact, repeatedly and over time against a victim who cannot easily defend him or herself [35].

When the online gaming factor is introduced, similar definitions are adapted as exemplified by a study [36] on social experiences and online gaming referring cyberbullying as "an individual or group willfully using information and communication involving electronic technologies to facilitate deliberate and repeated harassment or threat to another individual or group by sending or posting cruel text and/or graphics using technological means." (p. 160). Sometimes, the terms online harassment and cyberbullying were used interchangeably, essentially referring to threats or offensive behavior delivered via technology mediums (e.g., email, social networking sites) [37].

Many consider cyberbullying to be a special type of bullying. Logically some researchers derived their definition of cyberbullying from [38] classic definition of bullying. For example, [39] depicted cyberbullying as "willful and repeated harm inflicted through the use of e-mail, cell phone, instant messaging, and defamatory Web sites" (p. 388). While repetition is considered an important characteristic of bullying, researchers increasingly question this issue. Espelage [4] described several legal cases in which bullying victims committed suicide, yet school staff did not take actions because the alleged bullying behaviors were not repeated. She therefore challenges such definitions. Other scholars [35] raised similar questions concerning whether repetitiveness should be the essential characteristics of cyberbullying. One such strong argument is that cyberbullying behaviors can be repeatedly experienced even if it is one event because electronic materials can be easily preserved, quickly and widely distributed, and frequently shared.

As researchers agree the literature remains inconsistent with a universal definition for cyberbullying [40-42] argue that the increase in cyberbullying is in part due to the inconsistencies in the research.

Types of cyberbullying

With technology introducing new forms of bullying within the virtual world, via offering the luxury of anonymity, many forms of cyberbullying have been explored. [43] called those who cyberbully as flammers and trolls. Flammers are individuals who make insulting, hurtful,

and mean remarks to fellow online users, whereas, trolls are individuals who trick others into doing foolish things (e.g., breaking codes) and then making fun of them. A distinct characteristic of trolls is that they tend to blame the victim for their harm arguing that the victims are willing to be hurt. As a result of this vulnerability, it is the victims rather than the trolls that cause the online abuse [44]. Developed a cyber-abuse model highlighting the multiple types of cyberbullying to include cyberstalking, masquerading, sexual harassment and coercion [45], threatening others, impersonation, exclusion of others, and trolling [46,47] categorized those who unintentionally hurt others via practical jokes as cyber mischief-makers, those who engage in deviant, dangerous behavior via posting threats or secret pictures as cyber rascals, and those who hack into other computers and spread explicit pictures and emails as cyber lords. While the technology continues to develop, people often find new ways to use and misuse those technological tools. Consequently, it is likely that cyberbullies will find new forms to abuse others. A critical question remains how do we operationally define cyberbullying in the research arena.

Bullying

Bullying and cyberbullying are two closely connected fields with some studies [48,49] clearly describing the overlap of the two. Although some may disagree, a vast majority consider that cyberbullying is one type of bullying [35,50]. In fact, it is claimed that “one of the most well established findings in the literature on cyberbullying so far, is the substantial – but not complete – overlap between involvement in traditional and in cyber forms” [51].

There are multiple definitions for bullying, and a plethora of operational definitions used in theoretical arguments and empirical support [5]. Originally defined by [52], bullying is “unwanted, aggressive behavior among school aged children that involves a real or perceived power imbalance. The behavior is repeated, or has the potential to be repeated, over time,” a definition stated on stopbullying.gov, a US federal government official website. Many subcategories have been identified including ‘overt’ and ‘covert’ acts of aggression [5]. A much-neglected area of bullying is sibling bullying, with a most recent review by Woke and colleagues [53]

Many factors influence aggression and bullying [14]. The Media Research Lab at Iowa State University reports that they can predict children at high risk of bullying behavior 80% of the time based on the following three factors: boys, involved in a fight in the past year, and consumed a lot of media violence. In addition, researchers report the best single predictor of future aggression is past aggression [54].

Multiple review studies exist [4,6,7] that systematically review the literature related to bullying. A detailed literature review about bullying, however, is beyond the scope of the current paper.

Common Factors

Our review of the related research shows that many factors (e.g., parental involvement, mental health, personality factors, etc.) influence all three main categories of this paper, namely cyberbullying, bullying and gaming. Needless to say the demographic variables play a significant role and many of the research studies described above have already confirmed this. The social environment, including parents, teachers, and peers, significantly shape people’s behavior, therefore their involvement in cyberbullying, bullying or gaming is important. For example, some researchers [55] stated that parents often feel that children experience bullying as part of the childhood experience, and

therefore, to some extent is expected. Yet, such parents’ beliefs may unintentionally contribute to the cycle of cyberbullying and bullying. A study found that 90% of cyber victims do not tell their parents because they do not believe that their teachers and parents are equipped to handle these situations [56]. Another reason that the victims do not inform adults is the fear of consequences such as losing computer privileges [56,57]. Similar patterns were identified by a Canadian study [58] of 269 7th -12th grade students where over 40% of cyber-victims would do nothing and only about one in every 10 would inform adults. Students’ distrust of adults and their fear that the cyberbullies could get back and escalate the problem were the top two reasons for the cyber-victims’ reluctance to report cyberbullying incidents to adults. Parents’ beliefs have also been researched in relation to games. Studies in this area generally fall to two types: desirable and undesirable effects of video games [59]. Although understanding positive potentials of games, parents often concern about: 1) the balance between game playing and other activities, 2) game content, 3) possible negative impact of games, 4) mediation strategies [60].

With the increase of technology, studies show more Internet use, which leads to higher risks of cyberbullying, online harassment, and sexual solicitation; however, little is known about specific mediums of this exposure, including parental factors. One study [39] explored the effect of parent mediation, defined as “...the activities carried out by parents to protect their children from exposure to online dangers”. Focusing on two types of mediation: restrictive mediation (i.e. the rules of Internet activity being determined by the parent), and evaluative mediation (i.e. open communication between the parent and child to jointly create rules). They found that monitoring web sites and providing guidance were effective at decreasing the risk of cyberbullying, but only for boys. Surprisingly, the location of the computer does not have a significant effect. The results suggested that cyberbullying occurs in spaces already deemed ‘safe’ by parents, and/or children are better at hiding their activities. In turn, this can increase children’s risk of cyber victimization.

The importance of bystanders has been widely researched in the field of bullying, but is under studied in cyberbullying. Bystanders refer to those who observe cyberbullying and/or bullying activities, yet fail to speak up especially in a peer setting. Much of the research reviewed in this paper suggests future research is needed in investigating the possible harmful effects of bystanders [5,36,61].

Interactions

Aggression is a concept closely linked to bullying or cyberbullying. While sometimes aggression and bullying are used interchangeably, we consider aggression a broader term to include bullying and cyberbullying. Table 1 lists the studies reviewed in the paper that examine gaming in relation to aggression (including bullying and cyberbullying). The studies are listed in alphabetical order of the authors with the information related to the research focus of the study, country, research design, sample size, age range, and the specific games used in the studies. We also coded the level of each study based on the Model. The last column describes the results of the studies, indicating the effect of gaming on the players. The following discussion starts with the review of gaming in relation to aggression in general, delineating both the negative and positive effects. Then we focus on the interactions between gaming and the two specific types of aggression: cyberbullying and bullying.

Gaming and Aggression in General

Year	Author(s)	Focus of Research (Level**)	Country	Design/ Sample Size	Age Range	Games	Effect of gaming
2001*	Anderson & Bushman [16]	Games & Aggression (Meso & Micro)	USA	Meta-Analysis	Mixed	General Violent Video Games	Negative
2010*	Anderson et. al. [17]	Games & Aggression (Meso & Micro)	Primary USA (Mixed)	Meta-Analysis	Mixed	General Violent Video Games	Negative
2006	Bartholow, Bushman, & Sestir [78]	Games & Aggression (Macro & Micro)	USA	Experimental, n=39	Mean age = 19.5	General Violent Video Games	Negative
2011	Carmona, Espinola, Cangas, & Iribarne [81]	Cyberbullying (Macro)	Spain	Survey, n = 35	Mean age = 15.29	Virtual Worlds	Positive
2012*	Connolly, Boyle, MacArthur, Hailey, & Boyle [20]	Games (Meso)	USA	Review, 129 papers	Mixed	General Games	Positive
2007*	Ferguson [79]	Games (Meso)	USA	Meta-Analysis	Mixed	General Violent Video Games	Mixed
2011	Ferguson [63]	Bullying & Games (Micro)	USA, Hispanic population	Survey n=302	Mean age = 12.34	General Violent Video Games	No long term effects
2014	Fryling, et al. [76]	Cyberbullying & games (micro)	Unknown (Gaming community)	Survey n=1025	Mean age=22	General game	negative
2012	Gentile & Bushman [54]	Games & Aggression (Macro)	USA	Survey n=430	Mean age = 9.7	General Violent Video Games	Negative
2009	Gentile et. al. [72]	Games (Macro & Meso)	Singapore	Survey, n= 727	7th-8th graders	General Games	Mixed
			Japan	Survey n=1830	5th-8th-11th graders	General Games	Mixed
			USA	Experimental n=161	Undergraduates	Super Mario Sunshine, Chibi Robo, Ty2, Crash Twinsanity, Pure Pinball, Super Monkey Ball Deluxe	Mixed
2013	Lam, Cheng, & Liu [75]	Cyberbullying (Macro)	Northeast China	Survey n=1278	Mean age = 14.7	General Games	Negative
2013	Leung & McBride-Chang [36]	Cyberbullying (Macro & Micro)	Hong Kong	Survey n=626	Mean age = 10.8	MMOG	Mixed
2011	Mark & Ratliffe [56]	Cyberbullying (Macro & Meso)	USA	Survey n=265	Middle school	Role-playing games	Negative
2009	Mesch [39]	Cyberbullying (Macro)	USA	Survey, n= 935	12-17 y/o	General games	no effect
2009	Olson, Kutner, Baer, Beresin, Warner, & Nicholi [80]	Bullying (Meso & Micro)	USA	Survey, n= 1254	7th-8th graders	General Violent Video Games; Grand Theft Auto	Negative
2012a	Saleem, Anderson, & Gentile [73]	Games & Behavior (Meso & Micro)	USA	Experimental n=191	Mean age = 11.4	Super Mario Sunshine, Chibi Robo, Ty2, Crash Twinsanity, Pure Pinball, Super Monkey Ball Deluxe	Mixed
2012b	Saleem, Anderson, & Gentile [74]	Games & Affect (Meso & Micro)	USA	Experimental n=330	Mean age = 19.57	Super Mario Sunshine, Chibi Robo, Ty2, Crash Twinsanity, Pure Pinball, Super Monkey Ball Deluxe	Mixed
2012	Tippett & Kwak [61]	Cyberbullying (Macro)	South Korea	Survey n=416	Mean age = 14.0	General Games	Negative
2009	Wright, Burnham, Inman & Ogorchock [82]	Cyberbullying (Macro)	USA	Mixed Methods, n=114	Middle school	General games, Virtual world	Positive
2012	Yang [47]	Bullying (Meso & Micro)	Taiwan	Survey, n= 1069	Adolescents	General Violent Video Games	Negative

Note. * Review studies. ** Levels as described in the theoretical framework

Table 1: List of studies examining gaming and aggression.

Negative effects of gaming

Many early research studies in video gaming focus on the negative effects and games increased association with violence. To date, the possible effects of violent video games remain a heated topic for debate among media and academics. On the one hand, media has often portrayed video games as evil, claiming that violent video game playing promotes violence. For example, after the Columbine shooting it was argued that playing Doom might have been a contributing factor; the Beltway Sniper shootings reported a connection to violent video games

and training the sniper to kill. The courts argued he played Halo and other shooting games, in addition to watching violent media.

Many research studies have also approached this issue. A multitude of research suggests that violent video games are linked to aggression [16,17,36]. Anderson and colleagues conducted two systematic analyses of the existing literature in this area, first in 2001 and the second in 2010 [17]. Their first study was a meta-analysis of 33 empirical studies of video-game literature and violence. Their result suggested that violent video games increase aggressive behavior and thoughts in adolescents,

in addition to decreasing prosocial behavior [16]. Their second meta-analysis review provided further support for linking violent video games to aggression and violence. It also added that violent video games may desensitize youth and create adolescents with less empathetic ability for others [17].

On the other hand, many scholars have argued against the idea that violent video game playing leads to violent behaviors in real life [62] despite America's tendency to blame mass tragedies and violent killings on violent video games. Recent studies have begun to demonstrate that there is no substantial evidence for long-term violent video game use and aggression [63-65].

In their book [66], discussed the correlation between video games and violence. They argued that numerous research studies have shown no connection between violent video game play and youth violent behavior. Since 1993 when video games have grown significantly, violent juvenile crime in the United States has been declining. In fact, arrests for murder, forcible rape, robbery, and aggravated assault dropped 49%. School violence has also decreased. Murder arrests plummeted 71% from 3,790 in 1993 to 1,110 by 2004 [66]. The Safe School Initiative Study by US government reviewed 37 incidences of school targeted violence between 1974-2000 in hopes to create a profile of potential problem youth [67]. In the end, no useful profile could be determined. The only commonalities suggested among potential attackers were being male with a history of suicide attempts and depression; video games were not even mentioned.

The inconsistent results suggest the lack of evidence linking real life violence to violent interactive games [68]. One criticism [63,68] of the current research in this area is that youth violence is not put into context with other factors and childhood predictors, along with experimental limitations in research methodologies. These limitations include the unrealistic amount of game play exposure (e.g., 10 minutes) compared to the actual amount of time spent playing video games. In addition, games are also usually played in a social setting (with friends), whereas, in research experiments they are often playing alone [69]. Limitations like these suggest that possible negative effects of violent games should not be so easily generalized.

Can Positive Gaming Negate Harmful Effects?

While the research literature to date has produced inconsistent results regarding aggression and violent video games, the positive effects of game playing (e.g., socialization, prosocial effects) should not be overlooked.

After reviewing the literature, a team [70] has advocated that more empirical research is needed investigating the positive effects of video games and whether or not these positive effects can begin to mitigate the negative effects of violent video game use. Games have powerful teaching capabilities that can capture emotions and embodied experiences [71]. Numerous violent games have engaging narrative and capturing entertainment, yet designers fail to produce the same engaging and capturing scenarios in game content in a positive medium [15]. Research in positive effects of gaming has begun to emerge recently exploring prosocial, neutral and violent games effects on both behaviors [72,73], and affect [74].

One study [73] investigated the short term effects of playing prosocial, neutral, or violent video games on helping behavior in a sample of 191 children between 9-14 years old using a tangram puzzle measure. Using an experimental design, participants were randomly assigned to a game type (i.e., violent, prosocial, neutral) condition and

played for 30 minutes. Upon completion of game play, participants were asked to assign eleven tangram puzzles, either an easy, medium, or hard level, to their partner. In addition, they were told their partner would receive a \$10 gift certificate if they completed ten of the puzzles in ten minutes. Results revealed that participants who played a prosocial video game were more helpful than those who played a violent video game, by assigning more easy puzzles. Those who played a violent video game were more likely to assign the more difficult puzzles, demonstrating hurtful behavior. The results also demonstrated that trait aggression is negatively related to helpful behavior, and positively correlated with hurtful behavior.

From a slightly different perspective, these researchers [74] explored state hostility and positive affect in relationship to different types of video games (e.g., prosocial, neutral, violent). A total of 332 participants completed measures assessing trait aggression and prosocialness, and then were randomly assigned to one of the three video game conditions (i.e., prosocial, violent, or neutral). There were a total of six games, two for each condition. Participants played for 20 minutes, then completed additional measures to include state affect and evaluation of the video game. They found that state hostility, aggravation, and mean feelings were reduced as positive affect increased while playing prosocial video games compared to the neutral and violent video game condition. In addition, the reverse was true when participants played violent video games. This research is one of the first to examine the result of affect on different types of video games in an experimental design.

Gaming and Cyberbullying

Since cyberbullying is a relatively new phenomenon, limited studies exist that explore the relationships between cyberbullying and gaming. Among these studies, [39] analyzed a telephone survey of 935 US students (12-17 year old). The results indicated that cyberbullying was not associated with playing online games. Tippet and conducted a pilot study with 193 Korean children to test the validity of a questionnaire. To their surprising, the results revealed that online games became a prominent area where children were experiencing bullying and harassment, which include three aspects: cyber victimization, cyberbullying, and observation of cyberbullying by bystanders. When cyber victimization was considered, about 43% of the participants had experienced this in the last two months. Of those, about half were bullied just once or twice over the previous months, but 30% had experienced on a regular basis, at least once a week. With respect to cyberbullies, about one third of the participants cyberbullied others in games in the last two months and close to half of them bullied others at least two to three times a month or more. For bystanders, every two out of five students having seen it occur within the previous two months. Of these, 17% said it had only taken place once or twice, while 12% witnessed online game bullying take place several times a week [61].

They then examined different forms of bullying (direct, indirect, mobile, internet, and online games), finding that anger was the most common feeling reported by the victim in all forms except online game bullying. 'Aggressive language', such as swearing or insults (reported by 64%), was the most frequent encounter of victims of online game bullying, followed by 'name calling' (44%), violence against one's avatar (16%), threats (12%), rumor spreading (4%), and social exclusion (2%). Interestingly, nearly half of those victims of online game bullying reported feelings of not being worried. Additionally, boys, compared to girls, were more likely to be online game bullies, victims and reported being more familiar with online game bullying [61].

[47] studied the relationship between online violent gaming and

gender, preference for playing violent online games, hostility, and aggressive behavior in regards to bullying. The sample consisted of 1069 adolescents with moderate Internet experience and reported playing online games in the past. The results revealed that gender was significantly related to participant's preference for violent video games, and had a direct effect and predictive power for hostility. Compared to their female counterpart, males preferred and enjoyed violent online games and showed higher levels of aggressive behavior. Also, the more the male experiences cyberbullying, the easier to predict aggressive behavior in his daily life. [47] demonstrated that characteristics of the perpetrator and the victim overlap, and that some victims may become perpetrators after being attacked, creating a vicious cycle.

One study [75] surveyed 13-18 years old high school students in China. Of the 1278 (619 males) participants, over 40% reported spending less than one hour each day playing violent games, close to one third played one to two hours per day, and about one in every five played greater than 3 hours per day. Of those that played online games, only about 15% reported their games were moderate to severe in violent content. Final analysis suggests that those sharing roles of cyberbullies and victims were two times as likely as the ones not involved in cyberbullying, to have been moderately or severely exposed to violent online gaming. Compared to those who were not involved in cyberbullying either as a perpetrator or a victim, those cyberbullies (but not being victimized) were four times more likely to be exposed to moderate or severe violent online game content. Overall, this study demonstrated no associations between exposure to online violent games and being a victim of cyberbullying. Exposure to violent online games increased the odds of being a perpetrator or perpetrator-victim of cyberbullying, but not a victim alone.

A recent study [76] investigated cyberbullying in multi-player online gaming environments through a survey of 1025 adolescents and adults (age range 12-70, average age 22). The participants (about 62% female and 38% male) were recruited from an online gaming forum. The results showed that more than one third of the participants avoided a multiplayer game because of the concerns about cyberbullying behavior. Cyberbullying incidents in an online game also caused over half of the participants leaving that game. Close to 65% of the participants considered cyberbullying to be a serious problem in the online gaming world. With respect to the prevalence of cyberbullying in an online gaming world, nearly eighty percent of the participants were cyber victims, one in three were cyberbullies, and over 90% had involved in cyberbullying as a bystander. The examination of potential psychological impact indicated that both victims and predators were negatively impacted by cyberbullying behaviors, resulting a net decrease in social interaction and self-esteem. However, compared to the predator group, both social interaction and self-esteem dropped notably more for the victim group.

To date, the few research studies exploring cyberbullying and gaming show inconsistent, sometimes even conflicting results. This suggests that research can only begin to demonstrate the complexity in cyberbullying and gaming. Yet, it points out that online gaming seems to become a prominent area for people to cyberbully others. Many factors, like gender, contribute to the complex phenomenon related to cyberbullying and gaming.

Gaming and Bullying

Gaming and bullying is often portrait as negatively connected. A survey conducted in 2010 by the Josephson Institute on Ethics [77] indicated that children's exposure to violent video games can impede

development of empathy and sympathy for others. In 2005, the American Psychological Association [15] stated that playing violent video games increases aggressive behavior and decreases helpful behavior, and hence not only called for a reduction of violence in video games and interactive media used by children and adolescents, but also endorsed teaching children to critically evaluate interactive media. The [78] in UK voiced concern about the influence of violent video games on primary school children. They reported that children as young as five are acting out violent scenes from video games on the school playground, reporting more observations of aggression, physical and relational, taking place in the classroom.

Researchers have also explored the effect of violent game playing through the lens of brain-based research. One study [78] examined violent video game effects via negative event-related potentials (nERPs) found within the brain. Their results suggested that those who are heavy players of violent video games display less empathetic sensitivity, and tend to display more aggressive tendencies in a laboratory task compared to controls.

While these results suggest a relationship between violence and violent games, the effect appears small and may be taken out of context [36]. Some [36,63,79] argue that we should not over simplifying findings by saying games are bad for children, but rather should pay attention to control the mediating effects. One study [80] investigated the relationship between frequent violent video game play and delinquent behavior among youth, controlling mediating factors such as trait anger, school performance, and aggressiveness. The participants were 1254 7th and 8th grade students who were asked to list the most recent games they played. Grand Theft Auto showed up consistently on the participant's top five lists. Results indicated that exposure to M-rated (mature - suitable for age 17+) games was a strong predictor of being bullies, which was compounded by the days played. M-rated game playing, however, was not connected with victimization. In addition, they found that trait anger, or aggressive personality was not a predictor of preference to M rated games. Gender effects were also identified showing that for boys, aggressive personality was the strongest predictor of bullying, while video game play was not a predictor. Interestingly, for girls, M rated video game play became a strong predictor of bullying and fighting [80].

Building upon past research of mediating factors of aggression and violent video games, [63] assesses 302 students (mean age=12.34), a mostly Hispanic population, using clinically validated measures. The results revealed that current depressive symptoms were most predictive of violent outcomes in any of the models explored, while video game violence was not even a "trivial effect". In other words, violent game exposure had no long-term effects of aggression, rather depression may be the prevention key to serious aggression in youth.

Such mixed results from research highlight that we should not ignore the voice of the community of gamers, parents, and other adults who defended video games and reported that not everyone that plays violent games is violent.

Can gaming help fight bullying and cyberbullying?

With the inconsistencies in whether violent video games increase aggression, it is important that we do not overlook the positive effects of game playing (i.e., socialization). For example, in Massive Multiplayer Online Games (MMOGs), players interact anonymously and simultaneously with each other, build identities, form relationships, and establish social networks. Based on past research that real friendships

can act as a buffer to victimization, one study [36] investigated if online friendships can provide the same effects. Over 600 fifth and sixth grade students in Hong Kong participated in the study. Results revealed that 56% played MMOGs in the previous three months and boys played significantly more than girls. Over 93% reported having formed online friendships in MMOGs. Less than one eighth who played MMOGs reported being victims of cyberbullying. In addition, one eighth rated themselves as cyberbullies and reported engaging in the behavior frequently. Their analysis indicated that online friendships, similar to real life friendships, contributed significantly to all the psychosocial constructs measured. That is, friendships formed in online gaming environments could help boost children's overall psychological well-being. As well, online friendships benefit both gender group to the same degree [36].

The growing research regarding positive effects of game play leads to explorations of how video gaming can help in the prevention of bullying and cyberbullying. Though limited, game design has begun addressing these areas. For example, a game was developed and piloted with over 1000 children in Europe to explore how to reduce bullying [81]. The game is called "FearNot!" where kids can witness bullying situations without being directly involved. Each player takes the role of an invisible friend of the victimized character, discussing problems, possible solutions, and ways to cope. This influences the choices and narrative of where the game goes. Unfortunately no evaluation publications of this project could be found and hence the effect of such an approach cannot be determined.

In a similar vein, a team in Spain [82] created a 3D virtual world, Mii School (MS), to address substance abuse, bullying, and mental disorders in adolescents. Aiming to help with early detection of these problem areas in youth, MS enabled players to experience emotions and feelings similar to real world scenarios in bullying, substance abuse, and mental disorders. In addition, this game can be used in a therapeutic setting where the therapist can change the stimuli in the game increasing the complexity of the levels. MS was piloted in a secondary school with 35 students (14 - 17 years old), with the MS program results being compared to a paper and pencil questionnaire. Interestingly, more students reported higher rates of being bullied on the paper questionnaire compared to the MS program. In the MS environment, when immersed in bullying situations, bullies often responded with feeling ashamed and simulated not listening to insults, but those who were not bullied answered insults from others sarcastically, with more insults, and some responses included violent threats.

Another group [83] explored the use of creating virtual scenarios in Second Life to educate students about cyberbullying. There were three phases investigating cyberbullying, implementation of the virtual world, and its effectiveness in educating young adults. Phase I consisted of a survey adapted from assessing cyberbullying. The survey results revealed that MySpace was the most prevalent source to experience cyberbullying. More than half of students on MySpace reported being a cyber-victim and around 70% reported being a cyberbully. Interestingly, one third of the students reported being a cyber-victim through virtual games, and one fourth reported being a cyberbully in games. Phase II consisted of a focus group stemming from data collected during phase I. The results revealed that high poverty schools displayed more aggression in their responses to bullying compared to the low poverty schools, which were more passive in their responses. Therefore, these researchers [83] suggest that socio economic status may play a mediating role in instances of cyberbullying. In the final phase, two participants viewed the virtual scenarios and evaluated

them; the overall response suggested that the scenarios were realistic because kids often play interactive games.

Conclusions

Since cyberbullying is still a relatively new phenomenon, research studies, especially related to gaming, are scarce. Our review provides a first step towards a comprehensive understanding of the phenomena. This section first discusses the possible intervention strategies, linking them to the EMGCB model whenever appropriate. The focus then shifts to suggest future studies.

Intervention strategies

Conforming to EMGCB, intervention strategies need to be considered in different levels, including mesa, micro, and macro levels. Previous meta-analysis demonstrated that training is strongly associated with reducing cyberbullying/bullying [84]. Training, therefore, need to not just focus on individual students, but also adults. For adults, while previous research emphasized on educating all school staff, parents, and families, our model suggests that members in gaming communities are also essential to be involved since cyberbullying occurs frequently in gaming environments. Educating adults need to consider not only cyberbullying/ bullying related topics and technology use, but also knowledge about gaming. Adequate understanding of effective strategies to address cyberbullying and bullying should also include, but not limit to, knowledge about cyberbullying/bullying in relation to gaming, mental health, emotions, and demographic matters.

While improving young people's understanding and skills is equally important, the approaches to train young people should be different from adult training, because video and other multimedia methods prove to be more effective than regular curriculum integration for youth [85]. Given youths fascination with gaming and multimedia, the EMGCB suggest that one best approach may be to games as a platform for bullying/ cyberbullying prevention and intervention. There are two ways to implement such an approach. First, we can use existing gaming communities (e.g. World of Warcraft community) to impart knowledge about ways to respond effectively to cyberbullying/bullying. Secondly, we can build anti-bullying games to teach people needed information and skills. It is optimal that both youth and adults are involved in such gaming environments.

Proactive policies, plans and practices are key factors as identified in earlier review studies [84,85] to reduce cyberbullying/bullying. Based on our model, we recommend that a whole-school formal anti-bullying policy should also consider people's gaming behaviors to send clear and consistent messages to guide actions of people for the prevention and intervention of cyberbullying/bullying behaviors.

Building and sustaining a safe and supportive environment, in both real and virtual worlds, is another factor that can reduce cyberbullying/ bullying [51]. Students need a positive climate that goes beyond school boundaries. Earlier studies [57] found that extracurricular activities, such as sport and recreation, can lead youth to report cyberbullying incidents as well as decreasing their chance to retaliate others when they are cyberbullied. Gaming is such a wonderful media for recreation and entertainment, hence provides a great way to increase school connectedness and social networks for youth and adults. One possible strategy, as our model implied, is to create games that involve students and their teachers, parents, family members, or even administrators to help build a supportive social environment in schools and gaming worlds.

Collaboration amongst schools, families, and communities is a must to effectively address cyberbullying/bullying issues [51]. Building partnerships amongst schools and communities can help develop a comprehensive and coordinate approach to cyberbullying/ bullying prevention. According to our model, forming partnerships should involve not just students, teachers, and parents, but also professionals in the area of mental health, physicians and drug and alcohol counselors, gaming experts, and technology experts.

Future Research

In this review, we have proposed the Enactivist Model of Cyberbullying, Bullying and Gaming, which suggests that the exploration of cyberbullying and bullying in relation to gaming should be conducted in a holistic fashion rather than limiting the focus on individuals' aggressive behavior. Enactivism stresses the importance of the interplay of systems' parts. Therefore, macro, meso and micro level variables should all be examined with a focus on the interactions of them. The investigation should not only concentrate on individuals' acts and mind (including their behavior, attitude, emotions, mental health), but also the social environment in which they situate (e.g., their victims, their peers, their schools, their technology access, their game buddies). For example, longitudinal studies can investigate the interactions of students (including cyberbullies, their victims), their peers (including their game buddies), and parents, through multiple-point surveys, and continued observation of the student behaviors (including cyberbullying/bullying and gaming) in different environments (e.g. home, school). Another possibility is designing research-supported games addressing cyberbullying/bullying problems and then conducting experimental studies involving students, parents, school personnel to examine the effects of such games. Employing design based research considering variables at the micro, meso, and macro levels (e.g. student demographics, school environments, gaming behaviors) can provide another lens to explore potentials of digital games in addressing cyberbullying/bullying issues. Combating cyberbullying and bullying should be a collective effort on the part of schools, families, peers, and society.

There is still much to be explored, examined, and investigated in regards to cyberbullying and its relationship to gaming. As an overview of the research represented in Table 1 indicates, the existing empirical studies on cyberbullying in connections with gaming are predominantly using survey design, with just a few studies employing experimental design approach. Other research designs such as qualitative approach to explore cyberbullying, bullying in connection with gaming is virtually nonexistent. This calls for future research adapting a more diverse design, especially experimental design and or qualitative or mixed research to broaden our understanding about this phenomenon. In addition, longitudinal studies may help elucidate the different patterns of change or stability of people and consequently will shed light on the controversy about the long-term effect of gaming on aggression.

As well, this review reveals that virtually no study examining the connections between gaming and cyberbullying/bullying has looked at variables from all three levels (i.e. macro, meso, micro), let alone the interactions amongst the variables. Future studies are recommended not only to holistically analyze the phenomenon from all 3 levels but also to pay particular attention to the interplay of these factors.

As indicated in Table 1, a majority of the current studies in the field are US studies, with only a handful of Asian studies, and one European study. While it is well documented that cyberbullying is an international phenomenon [40], apparently there is a lack of international studies

focusing on cyberbullying and gaming. Researchers need to expand the landscape with international perspectives on studies examining the association between bullying/cyberbullying and gaming. Comparative studies juxtaposing data from different countries and even continents will also deepen our understanding of the phenomena.

Another area of research yet to be developed is investigating the effects of the actual game content itself [17,72,73]. Some [80] suggest that parents should play video games with their children in order to better understand the appeal of the game and motivation of playing, which may help stop bullying and other acts of aggression.

Consistent throughout the literature is the need for education of students, teachers, parents, and higher education institutions in order to prevent cyberbullying. Yet, almost all of the studies in the field have centered the attention on the negative effects of gaming and its connection with aggression. This review highlights the lack of empirical studies and the limited knowledge on whether and how gaming can have positive effects on players. Very few studies explored the potential of gaming and how we can harness the power of gaming to educate or help address cyberbullying and bullying issues. For example, can we develop educational games to address cyberbullying by teaching students how to fight cyberbullies or by educating bystanders? Future studies on positive effects of gaming in relation to cyberbullying and bullying are highly recommended. As well, design based research integrating game design into cyberbullying/bullying studies will provide useful information for the development of intervention and prevention programs.

A comprehensive understanding of the phenomenon from all perspectives is the precursor to the development of successful prevention strategies and intervention programs to address cyberbullying and bullying. Until then, we may be able to develop education that supports children's healthy lifestyles inside and outside of schools, in real life or out in cyberspace.

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