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Violent audiovisual content and social consequences: The moderating role of aggression in adolescents

Abstract: Numerous studies have linked the consumption of violent audiovisual content to the increase of aggressive cognitions and behaviors. This research aims to clarify whether the possible harmful consequences of violent videogames might vary depending on an individual variable such as trait aggressiveness. A correlational study was carried out among 6,130 teenagers (average age of 13.8 years) from two European countries, in which it became evident, by means of multiple regression analyses, that there was a positive correlation between the use of violent videogames and aggressive behavioral intentions. More relevantly, these correlations were greater amongst those subjects with higher scores on the Aggression Scale. Finally, when analyzing the subjective experiences of users of violent videogames, the more aggressive individuals manifested a greater desire to imitate the characters of the interactive content, admitting that they ended up more agitated even when their initial objective was to relieve tension or relax. Practical and theoretical implications (e.g., Catharsis theory) of those results are discussed.

Keywords: audiovisual content, violent videogames, aggression, adolescents, catharsis

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1 Introduction

1.1 Active violent audiovisual content and its social consequences

Although violence has been present in all known societies, it is a problem which concerns the population as a whole, given the social, political and economic damage it causes to societies where it is found (Tharp, Simon, and Saul, 2012). Due to its very nature, violence tends to generate even more violent behavior, thereby spiraling and causing serious social problems which prove difficult to eradicate, creating serious obstacles to the integral development of people, especially the younger generation (Orue et al., 2011)

A large part of this violence is reflected in the media. For example, television displays some kind of violence in 6 out of 10 programs, at a rate of 4.5 acts per program (Signorielli, 2003). Given the extensive access most people have to all types of media, this means that *virtually* all members of a society may be highly exposed to violent content on a daily basis. American youth, for example, devote more time to media than to any other waking activity, as much as one-third of each day (Roberts, 2000). Similar data are available from studies carried out in Europe and Asia (Anderson, Berkowitz, et al., 2003). The consequences of *virtual* violence can end up becoming real when aggressive perceptions, attitudes and behaviors of people exposed to violent audiovisual content are generated or heightened.

In this sense, there is a broad and contrasted line of research (e.g., Anderson, 1997; Anderson, Berkowitz, et al., 2003; Anderson and Bushman, 2002; Anderson and Dill, 2000; Bushman and Anderson, 2001; Carnagey, Anderson, and Bartholow, 2007; Clemente, Espinosa, and Vidal, 2008; Gentile, Saleem, and Anderson, 2007; Huesmann and Moise, 1996; Huesmann, Moise-Titus, Podolski, and Eron, 2003; Huesmann and Taylor, 2006) which demonstrates how media-related violence (television, films, videogames and music) increases the probability of aggressive behavior both in the short and medium term.

A great deal of prior literature has focused on the possible effects of violence transmitted through traditional audiovisual screens (series, films, documentaries, news reports, etc.), considering that the population has been more widely exposed to this type of content. However, more recent research (e.g., Polman, De Castro, and Van Aken, 2008) shows that videogames, compared to other violent audiovisual content, might have greater relevance given the bigger effects they produce on young individuals and the significant penetration of violent electronic games into adolescent culture (Funk, Hagan, et al., 2002). The main difference lies in the fact that, compared to the generally passive role

adopted in front of the traditional television screen or at the cinema, in the case of videogames, the role of the individual has an essentially active character whereby he participates fully in the development of the violent content or is even, in many cases, its protagonist (Bushman and Huesmann, 2010). Therefore, we can distinguish between more passive visual media in which the viewers observe only, and interactive visual media in which viewers both observe and interact with the characters displayed in the media (Anderson, Berkowitz, et al., 2003).

One of the most powerful mechanisms when explaining the influence of violent audiovisual content on behavior is the phenomenon of imitation (Bandura, Ross, and Ross, 1963). The interactive nature of videogames might increase the risk and the probability of the generation of episodes of real violence since people learn and imitate better when they are actively involved in the learning process; they identify more closely with the violent characters in the videogames that they use, and obtain direct rewards when they use violence in the game (Polman et al., 2008).

In accordance with the above, we believe it is of particular interest to focus our study on videogames, enabling us to consider the social implications of this type of active violent content. With respect to the above-mentioned implications this is not an area free of controversy (e.g., Browne and Hamilton-Gianchritsis, 2005; Pollard-Sacks, Bushman, and Anderson, 2011). However, even though there are a significant number of studies questioning the existence of such effects (e.g., Ferguson, 2011; Ferguson and Kilburn, 2010; Ferguson, San Miguel, Garza, and Jerabeck, 2012; Savage and Yancey, 2008), there are an increasing number of studies and researchers who state that there is a significant relationship between exposure to violent videogames and aggressive behavior. That is to say, they state that playing violent videogames increases the probability of carrying over aggressive behavior into real-life scenarios (e.g, Barlett, Anderson and Swing, 2009; DeLisi, Vaughn, Gentile, Anderson, and Shook, 2013; Holtz and Appel, 2011). We understand aggressive behavior as any behavior that is intended to harm another person who does not want to be harmed. Violence, on the other hand, can be considered as any act of aggression that has extreme physical harm such as injury or death as its goal. In addition, depending on how the aggressive act is expressed, we can distinguish different forms of aggression such as physical, verbal or social aggression (Bushman and Huesmann, 2010).

Similar effects have been found in longitudinal studies carried out with North American, European and Asian populations. Specifically, those who played more violent videogames at the time of the initial measurement later showed a greater increase of aggression during the period of observation (e.g.,

Anderson, Sakamoto, et al., 2008; Möller and Krahé, 2009; Wallenious and Punamäki, 2008).

Similarly, experimental studies carried out in laboratories show how individuals assigned randomly to play violent videogames exhibited a more aggressive behavior than those who were randomly assigned to play non-violent games (e.g., Anderson, Carnagey, et al., 2004; Bartholow and Anderson, 2002; Bushman and Anderson, 2002; Irwin and Gross, 1995). Likewise, recent neuroscientific studies (e.g., Carnagey et al., 2007; Weber, Ritterfeld, and Mathiak, 2006) reveal that playing violent videogames causes neuronal patterns (obtained by FMRI: *Functional Magnetic Resonance Imaging*) similar to those patterns generated when individuals experience aggressive cognitions and behaviors, providing some meaningful insights about the possible mechanisms by which violent videogames might affect players' cognitions and emotions. Moreover, extensive meta-analyses (e.g., Anderson and Bushman, 2001; Anderson, Shibuya, et al., 2010) of research carried out to date have reached the conclusion that violent videogames are a risk factor in the increase of aggressive thoughts, emotions and behavior both in the short and the long term.

Immediately following their use, there is an increase in the tendency to behave in an aggressive way, since, as stated by the *General Aggression Model* (GAM; Carnagey and Anderson, 2003), there is also an increase in hostile and aggressive thoughts and emotions (Anderson, Carnagey, et al., 2004), as well as physiological activation (Lynch, 1999). In consequence, this could enhance the probability that any ambiguous signal in the environment may be interpreted as a threat or provocation (Bushman and Anderson, 2002; Kirsh, 1998).

Additionally, the longer individuals spend playing, the more accumulative the effects become over time (Bushman and Gibson, 2011; Hasan, Beguen, Scharkow, and Bushman, 2013). The repeated and continuous use of violent videogames can lead to a loss of sensitivity, thereby increasing the level of indifference when faced with violent situations (Anderson, Gentile & Buckley, 2007; Engelhardt, Bartholow, Kerr, and Bushman, 2011). In turn, a reiterated exposure to this type of videogame leads to the creation of mental scripts which tend to become automatic, making it increasingly difficult to think and generate non-violent ideas or possibilities when resolving conflicts. These scripts can lead to the individual thinking that aggressive or violent behavior is normal, appropriate or convenient (e.g., Anderson and Huesmann, 2003; Todorov and Bargh, 2002).

Finally, repeatedly playing violent videogames can progressively modify one's self-image. Those who play them may start to see themselves (even subconsciously) as being more violent (Uhlmann and Swanson, 2004) and, there-

fore, to develop an inclination to behave according to their self-image (Festinger, 1957).

Therefore, the body of research carried out to date, both that which has been carried out in laboratories and that which has been generated in a real-life context, has revealed that the use of violent videogames gives rise to effects resulting from repeated exposure, both immediately following their use and in the long term.

1.2 Trait aggressiveness as a differentiating factor

Whereas the majority of the population is exposed to audiovisual violence, it would appear that not everyone is affected by violent audiovisual content to the same degree. For example, previous research has found that violent media effects might vary depending on different individuals and social variables such as sensation seeking, alienation, victimization (Slater, Henry, Swaim, and Cardador, 2004), psychoticism (Markey and Scherer, 2009), psychopathology (Funk et al., 2002) and family conflict (Fikkers, Piotrowsky, Weeda, Vossen, and Valkenburg, 2013). In the case of videogames, the more or less aggressive personality of the player might be one of the characteristics which play a significant moderating role. Thus, it would be reasonable to assume that violent videogames may have an even greater effect on those who have a more aggressive personality. If this were the case, we could be facing a problem with greater social repercussions since this group represents a high-risk population that is more likely to develop aggressive behaviors.

In fact, in the area of passive audiovisual media (e.g., films), Bushman (1995) found in one of his studies not only that individuals demonstrated more aggressive behavior after watching violent audiovisual content, but that, in addition, this effect was particularly significant in those individuals with a more violent personality. Bushman explains this difference based on Berkowitz's (1974, 1990) theory of cognitive association. According to this theory, it could be argued that more aggressive people are also more sensitive to audiovisual content and violent videogames because their network of cognitive associations related to violence is greater and more easily activated (Bushman, 1996).

However, in the arena of active audiovisual media this relation is not as clear as it might appear to be initially. On the one hand, as we have already mentioned, it would be reasonable to assume that, just as occurs with the violence contained in passive audiovisual media, the harmful effects derived from the use of videogames may be greater in those who are already more aggressive (e.g., Gentile, Lynch, Linder, and Walsh, 2004; Markey and Markey,

2010). Similarly, Lynch (1999), for example, found that the effect on physiological activation derived from playing violent videogames was greater in those children who, previously, had already shown more violent tendencies.

Nevertheless, in accordance with other alternative approaches, it could be assumed that, in some circumstances, the relation between violent videogames and aggressive personality might produce an opposite result. For some authors (e.g., Kestenbaum and Weinstein, 1985), playing violent videogames could have a cathartic effect. That is, it could provide a means whereby more violent people could purge their aggression in a controlled context and in a non-harmful way. The hypothesis of catharsis is supported in the *Hydraulic Model of Aggression* (Lorenz, 1966), according to which anger, which is derived naturally and constantly from daily frustrations, builds up within people and, to the extent that it increases, it exercises a pressure similar to that of a pressure cooker. Therefore, according to this model, the only way to reduce that pressure and thereby avoid a later, more serious explosion of aggression is to allow the anger to escape in a controlled way. According to this model, for individuals with aggressive personality traits, who, consequently, have a greater amount of built-up anger which exercises a dangerous amount of pressure, it could actually be beneficial to play violent videogames as a means of venting their aggression in an inoffensive way. Along the same lines, Unsworth, Devilly and Ward (2007) state that violent videogames may increase aggression, in particular in those who are not violent, but that, paradoxically, they may reduce aggression in those who are more aggressive.

Added to this apparent confusion of results and evidence moving in opposite directions (e.g., Bushman, 2002; Unsworth et al., 2007), some authors have shown that many of the studies focusing on the catharsis hypothesis have been the subject of methodological criticism (e.g., Ferguson, Olson, Kutner, and Warner, 2010). In other cases, alternative explanations to catharsis effects have been offered. Sherry (2007), for example, found that the subjects who played violent videogames for longer periods of time showed less aggression than those who had spent less time playing. However, as the author himself points out, this could be due in particular to the fact that those who play and practice videogames for longer reduce the frustration produced by not knowing how to play a new and complex game, and not so much due to the catharsis hypothesis.

All that has been said up to this point indicates the need to continue to dig deeper into the relationship between violent videogames and aggressive individuals, not only in order to acquire a better understanding of the phenomenon, but also because of the relevance of the social consequences and decisions that may be made on the basis of these conclusions. Bushman and Whit-

aker (2010), for example, show that those who think that the catharsis theory is correct feel more attracted to playing violent videogames. If the catharsis theory were incorrect, encouraging aggressive people to release their anger by means of violent videogames might not only be ineffective but even counterproductive.

Given the social relevance of the topic and the disparity of the results, the purpose of this study is to continue to delve deeper into the nature of the relationship that exists between violent videogames and their possible consequences, particularly in those individuals most prone to violence, and who are, therefore, of greatest interest due to their natural tendency to develop more aggressive behavior. To achieve this, within the framework of an applied research project, a study was carried out with a sample of more than 6,000 adolescent students in which both aggressiveness and the frequency and intensity of the use of violent videogames were measured.

The main aim was to study whether the relationship between the use of violent videogames and aggressive behavioral intentions might depend on the player's level of aggressiveness. Thus, if the relationship between violent videogames and aggressive intentions was weaker for those individuals who were more aggressive (vs. less aggressive players), those results could be interpreted in consonance with the existence of a cathartic effect. Conversely, if the abovementioned relationship was stronger for the aggressive individuals, it could mean that a cathartic effect was not taking place.

In addition, to better understand the nature of this possible relationship, we investigated the perception the players have about different aspects of their experience during the use of violent videogames.

2 Method

2.1 Participants

Six thousand one hundred and thirty (6,130) students participated in this study, selected from schools located in the main geographical areas of Spain (2,198) and Italy (3,932). Participation in the study was agreed with the school authorities together with the students' parents, so that they were able to fill in a questionnaire during school hours. The students were between 12 and 19 years old with an average age of 13.8 years (SD = 1.65). 45.8% were male and 54.2% female (Table 1). A multi-staged stratified random cluster sampling strategy was used, selecting three regions in each country of residence (North, Center and

Table 1: Sample demographic distribution.

	Total		Male		Female	
	(*N* = 6130)		(*N* = 2809)		(*N* = 3321)	
Characteristics	***N***	**%**	***N***	**%**	***N***	**%**
Country						
Spain	2198	35.86	784	35.67	1414	64.33
Italy	3932	64.14	2025	51.50	1907	48.50
Sex						
Male	2809	45.82				
Female	3321	54.18				
TOTAL	6130	100.00				
Age (*M* = 13.8; *SD* = 1.65)						
12	1460	23.82	741	26.38	719	21.65
13	1693	27.62	808	28.76	885	26.65
14	1196	19.51	554	19.72	642	19.33
15	894	14.58	421	14.99	473	14.24
16	426	6.95	172	6.12	254	7.65
17	241	3.93	78	2.78	163	4.91
18	86	1.40	24	0.86	62	1.87
19	134	2.19	11	0.39	123	3.70
TOTAL	6130	100.00	2809	100.00	3321	100.00

South) and, within each of these, a random selection of schools and classes. The actual sampling error (in the case of a simple random sample, with a confidence level of 95.5% [two sigmas] and P = Q) is ±1.3% for the sample as a whole.

2.2 Procedure

Data were collected between 29 November 2011 and 22 May 2012. The schools (34 in Italy and 23 in Spain) were selected randomly according to their socioeconomic and geographic significance. Once informed consent had been obtained from the educational establishments and the parents, all the students selected from the participating schools filled in the questionnaire. Moreover, it was agreed that it would be filled in during a compulsory attendance class to avoid the probability of incurring a self-selection bias.

Each participant used a computer terminal to complete the survey anonymously (without giving any information which might identify them) and confidentially (each pupil accessed a single computer terminal without other pupils

or the teacher seeing their answers); data were collected regarding their habits, attitudes, use, experience and knowledge about violent videogames, as well as a validated scale of aggression. Finally, the participants completed a scale in order to measure their aggressive behavioral intentions. Some basic guidelines were given to the teachers and tutors to enable them to administer the surveys, which were duly carried out during lesson time. To record and analyze the information gathered in the questionnaire, the SPSS statistical package was used.

2.3 Predictor variables

Consumption of violent videogames. The questionnaire which the adolescents were to fill out had a list of different types of videogames with recognized violent content (see Möller and Krahé, 2009). Each of these typologies was illustrated with examples of real videogames: military strategy (Medal of Honor, Gears of War, Call of Duty, Battlefield); mix (GTA – Grand Theft Auto San Andreas Vice City); beat-em ups (Tekken); shooter (Counterstrike, Resistance, Killzone) and horror (Resident Evil, Quake, Read Dead Redemption). For each element of the list, the students had to indicate with what frequency they played, on a Likert scale of 5 points which went from (1) "Never" to (5) "At least once a week". Based on these five types of videogames, a composite measure of violent videogames consumption was created (α = .90; M = 2.19; SD = 1.28).

Trait aggressiveness. In order to measure individual aggressiveness, the Aggression Questionnaire (AQ) (Buss and Perry, 1992) was used, adapted and validated into Spanish by Andreu, Peña and Graña (2002) and into Italian by Palestini (2007). The scale is made up of 29 items related to aggressive behavior and feelings. These 29 items are coded on a Likert-type scale of 5 points (1: "Extremely uncharacteristic of me"; 2: "Somewhat uncharacteristic of me"; 3: "Neither uncharacteristic nor characteristic of me"; 4: "Somewhat characteristic of me"; 5: "Extremely characteristic of me"). Some of the items included in the scale, for example, are: "I have trouble controlling my temper" or "I get into fights a little more than the average person". This questionnaire, one of the most valid self-report techniques to assess aggression, consists of four subscales: Physical aggression (α = .83), Verbal aggression (α = .6), Anger (α = .69), and Hostility (α = .73). This scale has been widely used within the field of aggression research, and various investigations have shown that individuals with high scores on the Aggression Scale or on any of its sub-scales indicate a greater desire to watch violent audiovisual content and behave more aggressively, particularly if they have previously been provoked (Bushman, 1995;

Bushman and Wells, 1998; Giancola and Zeichner, 1995). The scores on the scale were highly reliable (α = .87), and ranged from 1.03 to 4.72 (M = 2.38; SD = .59). Both the reliability and the distribution of the factorial dimensions were similar to the original model and the scale validated into Spanish.

2.4 Criterion variables

Aggressive behavioral intentions. Participants had to position themselves on a scale of 13 items from 1 (Not at all willing) to 9 (Extremely willing) in which they graded their level of willingness to act aggressively in a series of situations: "I would like to learn how to use a real gun", "I would be willing to insult my classmates if they provoked me", "I would be willing to carry firearms if I lived in a dangerous neighborhood", "I would be willing to commit a violent crime under certain circumstances", "I would be willing to use violence if it helps me to achieve my aims", etc. Several of those items were adapted from Funk, Elliott, Urman, Flores, and Mock (1999) and Funk, Elliott, Bechtoldt, Pasold, and Tsavoussis (2003), and others, elaborated by ourselves, were added in order to construct a consistent composite measure. Given the high reliability among the items, an index of aggressive behavioral intentions was created (α = .86; M = 3.71; SD = 1.64).

Experiences when playing violent videogames. Students were asked to express their subjective experiences when playing violent videogames based on their level of agreement or disagreement with the following statements: "Playing violent videogames helps me learn quite a lot about real life"; "Playing violent videogames helps me feel safer in dangerous situations"; "When I play violent videogames I feel like imitating some of the characters"; "I play videogames to try and calm down or release tension"; "Playing violent videogames helps me relieve tension"; "After I have played violent videogames I feel more keyed up" and "Playing violent videogames makes me more violent". A scale of 9 points between (1) "Completely disagree" and (9) "Completely agree" was used to measure the agreement with each statement.

3 Results

3.1 Aggressive behavioral intentions

Following the procedures recommended by Aiken and West (1991), *aggressive behavioral intentions* were submitted to an analysis of multiple regression as

Table 2: Prediction of aggressive behavioural intentions.

	Criterion variable Aggressive behavioural intentions		
	β	***t* (4218)**	***p***
Predictor variables			
VVG Consumption	.32	20.09	< .001
Aggressiveness	.39	32.96	< .001
Aggressiveness *VVG Consumption	.05	3.85	< .001
	ΔR^2 (%) 25,1		< .001
ontrol variables			
Age	.12	10.63	< .001
Gender	−.17	−11.15	< .001
	ΔR^2 (%) 19,4		< .001
	Total R^2 (%) 44,7		< .001

criterion variable with *Trait aggressiveness* and *Consumption of violent videogames* as predictor variables. The main effects were interpreted in the first state of the regression and the interaction with the second (Cohen and Cohen, 1983).[1]

We submitted the index of aggressive behavioral intentions to the regression analysis. The results, after controlling for other individual variables such as gender and age, indicated a main effect of trait aggressiveness (β = .39), $t(4218) = 32.96$, $p < .001$, thereby indicating a positive relation between trait aggressiveness and aggressive behavioral intentions. Likewise, there was a main effect of the use of violent videogames (β = .32), $t(4218) = 20.09$, $p <$ .001, showing a correlation between the exposure to violent videogames and aggressive behavioral intentions. Finally, the results showed an interaction between the exposure to violent videogames and trait aggressiveness (β = .05), $t(4217) = 3.85$, $p < .001$ (Table 2). When this interaction was broken down into a standard deviation above and below the average for trait aggressiveness, the analysis revealed an effect of the exposure to violent videogames for those with low levels of trait aggressiveness (β = .27), $t(4217) = 13.24$, $p < .001$ and, what is more relevant, an even greater effect for those with high levels (β = .36), $t(4217) = 20.45$, $p < .001$.

1 Given that the pattern of results was equivalent in each of the two countries, and that there were no differences when the variable country was introduced in the interaction together with the variable predictors (Aggression and Consumption of violent videogames), it was decided to combine both data bases and analyze all the cases together. Likewise, the results did not differ depending on the gender of the participants.

Specifically, the more participants claimed to play violent videogames, the greater their aggressive behavioral intentions were, particularly amongst the more aggressive individuals. That is to say, the positive relation between the use of violent videogames and aggressive behavioral intentions is significant for all individuals, irrespective of their level of aggressiveness. However, the more aggressive they are, the more intense the correlation appears to be.

Interestingly, the three-way interaction between aggressiveness, violent videogame consumption and gender was not significant (β = .02), $t(4223)$ = 0.29, p = .76, showing that the previously found interaction between aggressiveness and violent videogame consumption was equally significant for boys and girls. However, a significant three-way interaction did emerge between aggressiveness, violent videogame consumption and age (β = –.03), $t(4223)$ = –2.34, p < .02. Specifically, when we decomposed this three-way interaction using the procedure advocated by Hayes (2012), the results revealed that the two-way interaction between aggressiveness and violent videogame consumption was only significant for younger participants (β = .12), $t(4223)$ = 3.69, p < .001 but not for those who were older (β = .005), $t(4223)$ = 0.15, p = .88.

3.2 Experiences when playing violent videogames

The analyses, after controlling for other individual variables such as gender and age, indicate a significant positive relation between trait aggressiveness and the different experiences in the use of violent videogames. Specifically, individuals with higher scores on the Aggression Scale state to a greater degree that when they play violent videogames they think that they are *learning quite a lot about real life* (r = .310, p < .001); that the games help them *feel safer in dangerous situations* (r = .348, p < .001); that they have a greater desire *to imitate the characters in the videogames* (r = .315, p < .001); that they play with the *intention of calming down or releasing tension* (r = .247, p < .001); that the games help them to *release tension* (r = .370, p < .001); that *they end up feeling more keyed up* (r = .256, p < .001); and that they consider the games to *make them more violent* (r = .304, p < .001) (Table 3).

These perceptions that the adolescents themselves admit to experiencing when they play violent videogames may help us to understand to a greater extent both their motivation in participating in this activity as well as its possible harmful consequences. As can be noted, several of these perceptions may reflect the intention behind using violent videogames as a learning tool for everyday life. That is, experiences from the virtual sphere would be transferred to real life. Players with more aggressive personalities state that violent video-

Table 3: Partial correlations between aggressiveness, age, gender and subjective experiences when playing violent videogames (n = 2783–3490).

	Aggressiveness	Age	Gender
I learn quite a lot about real life.	.310**	–.040	–.194**
VVG help me feel safer in dangerous situations.	.348**	–.070**	–.183**
I have a greater desire to imitate the characters in the videogame.	.315**	–.027	–.220**
I play with the intention of calming down.	.247**	–.101**	–.120**
VVG help me to release tension.	.370**	–.014	–.216**
I end up feeling more keyed up.	.256**	–.033	–.083**
VVG make me more violent.	.304**	–.047	–.087**

** p < .001

games provide them with tools for real life which enable them to feel safer in dangerous situations.

Nonetheless, a certain contradiction between their experiences when playing violent videogames can be found since they recognize that their motivation for playing them is to calm down, relax or release tension, although they also state that they end up more keyed up and are even convinced, up to a point that playing these games makes them become more violent.

4 Conclusions and discussion

The results of this study indicate that, as was expected, individuals with higher scores in the Aggression Questionnaire demonstrate more favorable aggressive behavioral intentions. Similarly, the results indicated that, after controlling for age and gender and regardless of the individual's aggressiveness, a positive correlation exists between the use of violent videogames and aggressive behavioral intentions. That is, playing violent videogames was a good predictor of aggressive intentions even for those individuals who were not aggressive. Therefore, these results fit with previous studies that argue for the existence of a relationship between playing violent video games and higher levels of aggressive behavioral intention. But more importantly, this correlation was even greater amongst those who obtained higher scores on the Aggression Scale. Thus, the results found in this research might help to better understand the moderating role of trait aggressiveness regarding possible harmful consequences of violent videogame consumption. It is worth noting that the aforementioned interaction between trait aggressiveness and violent videogame con-

sumption was especially significant for the younger participants in the study, showing that younger aggressive children might be even more vulnerable to this association between violent videogame consumption and the aggressive behavioral intentions.

In this respect, the results encountered in this study coincide with those of other works which opposed the catharsis theory. That is, for those who are more aggressive, playing violent videogames does not appear to be a strategy for venting and releasing tension; rather the opposite. Individuals who play more violent videogames are more favorable towards violence than those who play said games to a lesser degree.

The likelihood of a possible counter-cathartic effect occurring is reinforced from the analysis of subjective reactions of those who play violent videogames. These subjective perceptions could help us to understand why the catharsis theory might be incorrect, since the aggressive players state that when they finish playing they feel more keyed up than when they started; and they also feel that playing violent videogames could make them more violent. In addition, these results could induce us to think that simply believing in the catharsis theory could also be harmful since the more aggressive the players, the more they state that they play videogames in order to release tension or even to relax or calm down. If this were true, the expectation of emotional release not only would be frustrated, but, in addition, could create exactly the opposite effect, leading to an increase in real violence, especially amongst those with more aggressive personalities.

Similarly, the results suggest that the more aggressive people tend to identify with and experience a greater desire to imitate the characters of violent videogames. They also manifest a greater sense of usefulness, since playing these games makes them feel safer as they sense they are learning from these videogames in order to face real-life situations. In addition, the correlation found between aggressiveness and the desire to imitate the characters in the videogames reinforces the hypothesis that imitation makes up one of the basic mechanisms which could explain the influence that violent videogames exercise over those that play them. Again, we insist on the possible social significance of these results, since it is precisely the most aggressive people who think that using violent videogames could serve as a learning tool for their daily lives.

Therefore, our results contribute to the wider dialogue on the effects of violent videogames and help to clarify the relationship between the use of said videogames and their possible harmful consequences, particularly for those with more aggressive personalities. On the other hand, although it is true that the size of the correlations found is moderate, it should not be ignored since,

firstly, a small effect applied repeatedly on a large scale (i.e., a large number of individuals playing often over a long period of time) could have a significant impact on society. Secondly, it should be underlined that we are dealing with correlations of similar size to those found in other studies which have broached problems considered socially relevant (e.g., the relationship between tobacco and lung cancer, the use of condoms and the lowering of the risk of contracting HIV; Bushman and Huesmann, 2001). Moreover, the relevance of the results shown here is reinforced by the fact that they have been reached using a representative sample of more than six thousand adolescents enrolled in schools in two European countries.

In any event, this is not an obstacle to appealing for caution when interpreting the results, since it is a correlational design and, although the relationship between the variables in the study exists, it is not possible to infer a relationship of causality between them, nor the direction of the effect. For this reason, when considering further research into the possible cathartic effects or the possible harmful effects of violent videogames on aggressive individuals, new studies are necessary in which the use of violent videogames is manipulated experientially and not simply measured. Furthermore, it would be interesting if, in future investigations, rather than posing questions solely about aggressive behavioral intentions and their impressions with respect to the use of violent videogames, actual behaviors and aggression were measured. Finally, future research might also consider other variables (such as sensation seeking, family conflict, psychoticism, victimization, etc.) that were not measured or controlled in this investigation but have been signaled by previous literature as relevant to this topic.

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References

Aiken, L. S., & West, S. G. 1991. *Multiple regression: Testing and interpreting interactions*. Newbury Park, London: Sage.

Anderson, C. A. 1997. Effects of violent movies and trait hostility on hostile feelings and aggressive thoughts. *Aggressive Behaviour*, 23, 161–178.

Anderson, C. A., Berkowitz, L., Donnerstein, E., Huesmann, L. R., Johnson, J. D., Linz, D., ..., & Wartella, E. 2003. The influence of media violence on youth. *Psychological Science in the Public Interest*, 4, 81–110.

Anderson, C. A., & Bushman, B. J. 2001. Effects of violent video games on aggressive behaviour, aggressive cognition, aggressive affect, physiological arousal, and prosocial behaviour: A meta-analytic review of the scientific literature. *Psychological Science*, 12, 353–359.

Anderson, C. A., & Bushman, B. J. 2002. Media violence and societal violence. *Science*, 295, 2377–2378.

Anderson, C. A., Carnagey, N., Flanagan, M., Benjamin, A. J., Eubanks, J., & Valentine, J. C. 2004. Violent video games: Specific effects of violent content on aggressive thoughts and behaviour. *Advances in Experimental Social Psychology*, 36, 199–249.

Anderson, C. A., & Dill, K. E. 2000. Video games and aggressive thoughts, feelings, and behaviour in the laboratory and in life. *Journal of Personality and Social Psychology*, 78, 772–790.

Anderson, C. A., Gentile, D. A., & Buckley, K. E. 2007. Effect of video game violence on physiological desensitization to real-life violence. *Journal of Experimental Social Psychology*, 43, 489–496.

Anderson, C. A., & Huesmann, L. R. 2003. Human aggression: A social-cognitive view. In M. A. Hogg & J. Cooper (Eds.), *The Handbook of Social Psychology. Revised Edition* (pp. 296–323). London: Sage Publications.

Anderson, C. A., Sakamoto, A., Gentile, D. A., Ihori, N., Shibuya, A., Yukawa, S., ..., & Kobayashi, K. 2008. Longitudinal effects of violent video game aggression in Japan and the United States. *Pediatrics*, 122, 1067–1072.

Anderson, C. A., Shibuya, A., Ihori, N., Swing E. L., Bushman B. J., Sakamoto A, ..., & Saleem, M. 2010. Violent video game effects on aggression, empathy, and prosocial behaviour in Eastern and Western countries: A meta-analytic review. *Psychological Bulletin*, 136(2), 151–173.

Andreu, J. L., Peña, M. E., & Graña, J. L. 2002. Adaptación psicométrica de la versión española del Cuestionario de Agresión [Psychometric adaptation of the Spanish version of the aggression questionary]. *Psicothema*, 14, 476–482.

Bandura, A., Ross, S., & Ross, S. A. 1963. Imitation of film-mediated aggressive models. *Journal of Abnormal and Social Psychology*, 66(1), 3–11.

Barlett, C. P., Anderson, C. A., & Swing, L. E. 2009. Video game effects – confirmed, suspected and speculative: A review of the evidence. *Simulation & Gaming*, 40, 377–403.

Bartholow, B. D., & Anderson, C. A. 2002. *Effects of violent video games on aggressive behaviour: Potential sex differences*. *Journal of Experimental Social Psychology*, 38, 283–290.

Berkowitz, L. 1974. Some determinants of impulsive aggression: Role of mediated associations with reinforcements for aggression. *Psychological Review*, 81, 165–176.

Berkowitz, L. 1990. On the formation and regulation of anger and aggression: A cognitive-neoassociation analysis. *American Psychologist*, 45, 494–503.

Browne, K. D., & Hamilton-Gianchritsis, C. 2005. The influence of violent media on children and adolescents: A public-health approach. *Lancet*, 365, 702–710.

Bushman, B. J. 1995. Moderating role of trait aggressiveness in the effects of violent media on aggression. *Journal of Personality and Social Psychology*, 69, 950–960.

Bushman, B. J. 1996. Individual differences in the extent and development of aggressive cognitive-associative networks. *Personality and Social Psychology Bulletin*, 22, 811–819.

Bushman, B. J. 2002. Does venting anger feed or extinguish the flame? Catharsis, rumination, distraction, anger, and aggressive responding. *Personality and Social Psychology Bulletin*, 28, 724–731.

Bushman, B. J., & Anderson, C. A. 2001. Media violence and the American public: Scientific facts versus media misinformation. *American Psychologist*, 56, 477–489.

Bushman, B. J., & Anderson, C. A. 2002. Violent video games and hostile expectations: A test of the General Aggression Model. *Personality and Social Psychology Bulletin*, 28, 1679–1686.

Bushman, B. J., & Gibson, B. 2011. Violent video games cause an increase in aggression long after the game has been turned off. *Social Psychological and Personality Science*, 2, 29–32.

Bushman, B. J., & Huesmann, L. R. 2001. Effects of televised violence on aggression. In D. Singer, & J. Singer (Eds.), *Handbook of children and the media* (pp. 223–254). Thousand Oaks, CA: Sage Publications.

Bushman, B. J., & Huesmann, L. R. 2010. Aggression. In S. T. Fiske, D. T. Gilbert, & G. Lindzey (Eds.), *Handbook of social psychology* (pp. 833–863). New York: John Wiley & Sons.

Bushman, B. J., & Wells, G. L. 1998. Trait aggressiveness and hockey penalties: Predicting hot tempers on the ice. *Journal of Personality and Social Psychology*, 83, 969–974.

Bushman, B. J., & Whitaker, J. L. 2010. Like a magnet: Catharsis beliefs attract angry people to violent video games. *Psychological Science*, 21, 790–792.

Buss, A. H., & Perry, M. 1992. The aggression questionnaire. *Journal of Personality and Social Psychology*, 63, 452–459.

Carnagey, N. L., & Anderson, C. A. 2003. Theory in the study of media violence: The General Aggression Model. In D. A. Gentile (Ed.), *Media violence and children: A complete guide for parents and professionals* (pp. 87–106). West Port: Praeger.

Carnagey, N. L., Anderson, C. A., & Bartholow, B. D. 2007. Media violence and social neuroscience: New questions and new opportunities. *Current Directions in Psychological Science*, 16, 178–182.

Clemente, M., Espinosa, P., & Vidal, M. A. 2008. The media and violent behaviour in young people: Effects of the media on antisocial aggressive behaviour in a Spanish sample. *Journal of Applied Social Psychology*, 38(10), 2395–2409.

Cohen, J., & Cohen, P. 1983. *Applied multiple regression/correlation analysis for the behavioural sciences*. Hillsdale, NJ: L. Erlbaum Associates.

DeLisi, M., Vaughn, M. G., Gentile, D. A., Anderson, C. A., & Shook, J. J. 2013. Violent video games, delinquency, and youth violence: New evidence. *Youth Violence and Juvenile*, 11(2), 132–142.

Engelhardt, C. R., Bartholow, B. D., Kerr, G. T., & Bushman, B. J. 2011. This is your brain on violent video games: Neural desensitization to violence predicts increased aggression following violent video game exposure. *Journal of Experimental Social Psychology*, 47, 1033–1036.

Ferguson, C. J. 2011. Video games and youth violence: A prospective analysis in adolescents. *Journal of Youth and Adolescence*, 40(4), 377–391.

Ferguson, C. J., & Kilburn, J. 2010. Much ado about nothing: The misestimation and overinterpretation of violent video game effects in Eastern and Western nations: Comment on Anderson et al. 2010. *Psychological Bulletin*, 136(2), 174–178.

Ferguson, C. J., Olson, C. K., Kutner, L. A., & Warner, D. 2010. Violent video games, catharsis-seeking, bullying and delinquency: A multivariate analysis of effects. *Crime and Delinquency*, 4, 1–21.

Ferguson, C. J., San Miguel, C., Garza, A., & Jerabeck, J. M. 2012. A longitudinal test of video game violence influences on dating and aggression: A 3-year longitudinal study of adolescents. *Journal of Psychiatric Research*, 46(2), 141–146.

Festinger, L. 1957. *A theory of cognitive dissonance*. Stanford, CA: Stanford University Press.

Fikkers, K. M., Piotrowski, J. T., Weeda, W. D., Vossen, H. G. M., & Valkenburg, P. M. 2013. Double dose: High family conflict enhances the effect of media violence exposure on adolescents' aggression. *Societies*, 3, 280–292.

Funk, J. B., Elliott, R., Bechtoldt, H., Pasold, T., Tsavoussis, A. 2003. The attitudes towards violence scale: Child version. *Journal of Interpersonal Violence*, 18, 186–196.

Funk, J. B., Elliott, R., Urman, M. L., Flores, G. T., & Mock, R. M. 1999. The attitudes towards violence scale: A measure for adolescents. *Journal of Interpersonal Violence*, 14, 1123–1136.

Funk, J. B., Hagan, J., Schimming, J., Bullock, W. A., Buchman, D. D., & Myers, M. 2002. Aggression and psychopathology in adolescents with a preference for violent electronic games. *Aggressive Behaviour*, 28, 134–144.

Gentile, D. A., Lynch, P. J., Linder, J. R., & Walsh, D. A. 2004. The effects of violent video game habits on adolescent hostility, aggressive behaviours, and school performance. *Journal of Adolescence*, 27, 5–22.

Gentile, D. A., Saleem, M., & Anderson, C. A. 2007. Public policy and the effects of media violence on children. *Social Issues and Policy Review*, 1, 15–61.

Giancola, P. R., & Zeichner, A. 1995. Construct validity of a competitive reaction-time aggression paradigm. *Aggressive Behaviour*, 21, 199–204.

Hasan, Y., Beguen, L., Scharkow, M., & Bushman, B. J. 2013. The more you play, the more aggressive you become: A long-term experimental study of cumulative violent video game effects on hostile expectations and aggressive behaviour. *Journal of Experimental Social Psychology*, 49, 224–227.

Hayes, A. F. 2012. PROCESS: A versatile computational tool for observed variable mediation, moderation, and conditional process modeling [White paper]. Retrieved May 15, 2014 from http://www.afhayes.com/public/process2012.pdf.

Holtz, P., & Appel, M. 2011. Internet use and video gaming predict problem behavior in early adolescence. *Journal of Adolescence*, 34, 49–58.

Huesmann, L. R., & Moise, J. 1996. Media violence: A demonstrated public health threat to children. *Harvard Mental Health Letter*, 12(12), 5–8.

Huesmann, L. R., Moise-Titus, J., Podolski, C. L., & Eron, L. D. 2003. Longitudinal relations between children's exposure to TV violence and their aggressive and violent behaviour in young adulthood: 1977–1992. *Developmental Psychology*, 39, 201–221.

Huesmann, L. R., & Taylor, L. D. 2006. The role of media violence in violent behaviour. *Annual Review of Public Health*, 27(1), 393–415.

Irwin, A. R., & Gross, A. M. 1995. Cognitive tempo, violent video games, and aggressive behaviour in young boys. *Journal of Family Violence*, 10, 337–350.

Kestenbaum, G. I., & Weinstein, L. 1985. Personality, psychopathology, and developmental issues in male adolescent video game use. *Journal of the American Academy of Child Psychiatry*, 24, 325–337.

Kirsh, S. J. 1998. Seeing the world trough Mortal Kombat-colored glasses: Violent video games and the development of a short-term hostile attribution bias. *Childhood*, 5, 177–184.

Lorenz, K. 1966. *On aggression*. Methuen: London.

Lynch, P. J. 1999. Hostility, Type A behaviour, and stress hormones at rest and after playing violent video games in teenagers. *Psychosomatic Medicine*, 61, 113.

Markey, P. M., & Markey, C. N. 2010. Vulnerability to violent video games: A review and integration of personality research. *Review of General Psychology*, 14(2), 82–91.

Markey, P. M., & Scherer, K. 2009. An examination of psychoticism and motion capture controls as moderators of the effects of violent video games. *Computers in Human Behavior*, 25, 407–411.

Möller, I., & Krahé, B. 2009. Exposure to violent video games and aggression in German adolescents: A longitudinal analysis. *Aggressive Behaviour*, 35, 75–89.

Orue, I., Bushman, B. J., Calvete, E., Thomaes, S., Castro, B. O., & Hutteman, R. 2011. Monkey see, monkey do, monkey hurt: Longitudinal effects of exposure to violence on children's aggressive behaviour. *Social Psychological and Personality Science*, 1, 1–6.

Palestini, L. 2007. *Minacce all'identità sociale e comportamenti aggressivi in situazioni di provocazione e ritorsione* [Threats to social identity and aggressive behavior in a provocation and revenge context]. Doctoral thesis (Università di Bologna, Dipartimento di Scienze dell'educazione).

Pollard-Sacks, D., Bushman, B. J., & Anderson, C. A. 2011. Do violent video games harm children? *Northwestern University Law Review Colloquy*, 106, 1–12.

Polman, H., De Castro, B. O., & Van Aken, M. A. 2008. Experimental study of the differential effects of playing versus watching violent video games on children's aggressive behaviour. *Aggressive Behaviour*, 34(3), 256–264.

Roberts, D. F. 2000. Media and youth: Access, exposure, and privatization. *Journal of Adolescent Health*, 27(2), 8–14.

Savage, J., & Yancey, C. 2008. The effects of media violence exposure on criminal aggression. *Criminal Justice and Behavior*, 35(6), 772–791.

Sherry J. 2007. Violent video games and aggression: Why can't we find links? In R. Preiss, B. Gayle, N. Burrell, M. Allen, & J. Bryant (Eds.), *Mass media effects research: Advances through meta-analysis* (pp. 231–248). Mahwah, NJ: L. Erlbaum.

Signorielli, N. 2003. Prime-time violence 1993–2001: Has the picture really changed? *Journal of Broadcasting & Electronic Media*, 47(1), 36–57.

Slater, M. D., Henry, K. L., Swaim, R. C., & Cardador, J. M. 2004. Vulnerable teens, vulnerable times: How sensation seeking, alienation, and victimization moderate the violent media content–aggressiveness relation. *Communication Research*, 31, 642–668.

Tharp, A. T., Simon, T. R., & Saul, J. 2012. Preventing violence against children and youth. *Journal of Safety Research*, 43, 291–298.

Todorov, A., & Bargh, J. A. 2002. Automatic sources of aggression. *Aggression and Violent Behaviour*, 7, 53–68.

Uhlmann, E. L., & Swanson, J. 2004. Exposure to violent video games increases automatic aggressiveness. *Journal of Adolescence*, 27, 41–52.

Unsworth, G., Devilly, G., & Ward, T. 2007. The effect of playing violent videogames on adolescents: Should parents be quaking in their boots? *Psychology, Crime and Law*, 13, 383–394.

Wallenious, M., & Punamäki, R. 2008. Digital game violence and direct aggression in adolescence: A longitudinal study of the roles of sex, age, and parent-child communication. *Applied Developmental Psychology*, 29(4), 286–294.

Weber, R., Ritterfeld, U., & Mathiak, K. 2006. Does playing violent video games induce aggression? Empirical evidence of a functional magnetic resonance imaging study. *Media Psychology*, 8(1), 39–60.

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