Self-transcendence and Self-oriented Perspective as Mediators between Video game Playing and Aggressive Behaviour in Teenagers

PABLO ESPINOSA* and MIGUEL CLEMENTE
Universidad de La Coruña, Campus de Elviña, Facultad de Ciencias de la Educación, Departamento de Psicología, La Coruña, Spain

ABSTRACT

The present study examines the mediating effect of self-transcendence and a self-oriented perspective on the relationship between general video game playing and aggressive antisocial behaviour in a sample of 659 Spanish teenagers of both sexes aged 12 to 18 years (mean age = 15.31 years). Results show that there is a direct effect of the amount of video game playing on aggression, even when violent content is controlled for. Self-transcendence and a self-oriented perspective mediate this effect on aggression. These findings are in agreement with the hypothesis that the effects of media on behaviour are related to the socialisation pattern and role-taking opportunities they offer, and not only due to the mere exposure to violent media. Consistent with the time displacement hypothesis, an interpretation of our results may be that the relationship between video game playing and antisocial behaviour comes from a deficit of social interaction and role-taking opportunities. Not being able to adopt the perspective of others may result in a limited ability to predict the consequences of behaviour and understand the needs, desires, and intentions of others. This social perspective deficit may increase the chances of behaving antisocially through different processes. For instance, an individual may use aggressive behavioural patterns in the absence of a more elaborate behavioural repertoire, or the failure in predicting the effects of an aggressive behaviour may reduce the perception of its consequences.

Key words: aggressive behaviour; video games; self-transcendence; self-oriented perspective; adolescents

The objective of the present study was to examine the mediating effect of motivational values (Schwartz, 1992) and prosocial tendencies (Carlo & Randall, 2002) on the relationship between video game playing and aggressive antisocial behaviour.

A number of studies have examined the effects of video games on children and adolescents, identifying positive aspects like classroom learning, foreign-language learning, fostering...
social relations, and facilitating children therapies. Unfortunately, some negative aspects have also been described: addiction, physical symptoms like suffering from sore joints, social ostracism, lack of self-esteem, antisocial behaviours, and aggression (for a summary see Colwell & Payne, 2000). A significant negative relationship between video games and prosocial behaviour has also been reported by different authors (Anderson, 2004; Anderson & Bushman, 2001; Anderson et al., 2010; Wiegman & van Schie, 1998).

The majority of research on the cognitive and behavioural effects of the media has been related to its content, rather than to the amount of use per se, and it has mainly focused on violent media and aggressive behaviour (Anderson et al., 2010). Although the connection between media irrespective of content and antisocial behaviour is subject to controversy (Krahe & Moller, 2010), there is some evidence that the global amount of time spent watching television and using video games is related to verbal and physical aggression (Johnson, Cohen, Smailes, Kasen, & Brook, 2002; Santisteban, Alvarado, & Recio, 2007; Wittmann, Arce, & Santisteban, 2008) and to negative consequences for personal habits and commitments of adolescents, especially for boys who play over 5 hours a day (Hellstrom, Nilsson, Leppert, & Aslund, 2012). In addition, the amount of Internet use is related to problem behaviour (Holtz & Appel, 2011).

There is a certain amount of research suggesting a link between media and aggression. Bensley and Van Eenwyk (2001) indicated that video games in general show some evidence of affecting antisocial behaviour, and Colwell and Payne (2000) found that aggression is more correlated with game exposure than with the number of aggressive games played. Controlling for each other, game exposure predicted aggression, whereas the number of aggressive games played did not. In addition, Kuntsche (2004) found that media use in general (television viewing and video game playing), irrespective of content, was related to aggression of both teenaged boys and girls. These results were confirmed for television viewing across eight European and North American countries (Kuntsche et al., 2006). Furthermore, Lemmens, Valkenburg, and Peter (2011) found that high levels of pathological gaming were related to increased aggression for boys, regardless of contents. There is a lack of experimental studies on this topic; nevertheless, Robinson, Wilde, Navracruz, Haydel, and Varady (2001) found that an intervention program to reduce television and video game exposure in children decreased peer-rated aggression and verbal aggression in participants compared with a control group.

General media exposure admittedly includes exposure to violent content, although this is controlled for in some studies, but the association between media and aggression has also been found across different media contents. Ostrov, Gentile, and Crick (2006) found that exposure to educational media increased indirect aggression in children, and Ko, Yen, Liu, Huang, and Yen (2009) found that online chatting, viewing Web sites with sexual content, online gaming, and online gambling were all associated with aggression for adolescents addicted to the Internet. The above evidence suggests that the relationship between media and behaviour transcends violent content.

**Explanatory models**

One of the few explanations for the effects of media use is the time displacement hypothesis (Anderson et al., 2001). The time displacement hypothesis argues that media use takes time away from other social activities and may have an impact on cognitive development. In this line, Lemmens et al. (2011) found that excessive video gaming causes a displacement...
of real-world social interaction and may deteriorate existing relationships. They also found that the amount of gaming is related to social incompetence and aggressive behaviour (Lemmens, Valkenburg, & Peter, 2009). Furthermore, Colwell and Payne (2000) found that video game play and number of friends were negatively correlated, providing some support for a social isolation hypothesis. Computer games may lead to isolation and may also fulfill social interaction needs. Colwell and Payne developed a scale based on Selnow’s (1984) needs scale to measure the needs fulfilled by playing computer games. In this sense, not only the amount of play but also the degree of attachment to video games as a means to fulfill social needs would be important to determine how video games and aggression are related.

Cognitive mediators

Ferguson (2007, 2011) challenged the effect size reported in scientific literature for the link between violent video games and aggression and recommended a more careful control of third variables to explain this association. Although he played down the influence of video games on behaviour, he also suggested the appropriateness of using mediation analysis to explain the relationship between video games and negative behaviour.

Some personality and cognitive variables have been examined for their contribution to the explanation of the media and aggression link, although most of these variables have been related to dispositional traits like anger and hostility (Anderson & Bushman, 2001; Gentile, Lynch, Linder, & Walsh, 2004; Giumetti & Markey, 2007; Kiewitz & Weaver, 2001; Zillmann & Weaver, 2007). By contrast, little attention has been devoted to cognitive variables related to the children and adolescents’ social perspective. These variables may be of particular interest because as time displacement and social incompetence hypotheses suggest (Anderson et al., 2001; Lemmens et al., 2009, 2011), media use may be related to less social interaction, fewer social relationships and ultimately social incompetence, and a deprived social perspective due to a lack of role-taking opportunities. In turn, social perspective is also related to aggression (McGinley & Carlo, 2007), so it may be a cognitive mediator in explaining the relation between media and antisocial behaviour.

We can make a distinction between the content and structure of social perspective. By social perspective content, we mean variables related to what we think is right when making social decisions. One example is Schwartz’s universal motivational values (1992), which make a distinction between self-oriented and other-oriented values and establish the kind of issues that are important for each value (pursuing personal status and success for self-oriented values, for example, getting a promotion at work, and ensuring the well-being of others for other-oriented values, for example, looking after the family). The structure of social perspective deals with the level of complexity of social reasoning or how we reach a decision on a social issue. The social perspective in the child and teenager evolves from an initial egocentrism to higher levels of complexity, taking into account more elements in a social situation to reach a decision, through a process called decentration (Kohlberg, 1992). Social perspective structure is also reflected in the individual’s prosocial tendencies or motivation to help others. These tendencies to help can be either other-oriented, indicative of a high level of perspective taking (altruistic perspective), or self-oriented, to enhance one’s self worth and related to hedonistic reasoning, a low level of perspective taking and less internalized prosocial reasoning (public perspective) (Carlo & Randall, 2002).
Focusing on media violence, Huesmann (2007) stated that the possible long-term effects of violent video games on aggressive behaviour are the result of the observational learning of behaviours and cognitions and the desensitisation of emotional processes and enactive learning. This is congruent with the hypothesis that cognitive variables in children or teenagers, and in particular cognitions related to social perspective and empathy, would mediate in the relationship between the media and antisocial behaviours. We expect that the learning process described by Huesmann will extend beyond violent content and that there will be a similar relationship between general media use and antisocial behaviour.

THE PRESENT STUDY

Our main interest in the current study was to examine whether social perspective variables could help explain the association between media use and antisocial behaviour. Furthermore, if video game use is linked to social perspective in adolescents via the displacement of face-to-face social activities, and both video games and social perspective are related to aggressive behaviour, social perspective may play a role as a mediator between video games and aggression.

The current study focuses on adolescents because social perspective is mainly developed during childhood and especially during adolescence (Eisenberg, Carlo, Murphy, & Vancourt, 1995), which is a critical stage in the development of perspective taking and acquisition of values.

Thus, the objective of the present study was to examine the role of social perspective variables as cognitive mediators of the relationship between video game playing and antisocial aggressive behaviour. The following hypothesis was proposed:

Social perspective variables (self-transcendence and self-oriented perspective) will mediate the relationship between video game playing variables and antisocial aggressive behaviour in teenagers. In particular, self-transcendence will be negatively predicted by video game involvement and will be a negative predictor of antisocial aggressive behaviour, whereas a self-oriented social perspective will be positively predicted by video game involvement and will be a positive predictor of antisocial aggressive behaviour.

We also expect that although violent content in video games is related to aggression, there is a separate and distinctive relationship between global video game use and aggressive behaviour that will remain even after partialling out the effect of violence in video games, and accordingly, we propose a second hypothesis:

The effect of video game involvement on antisocial aggressive behaviour will persist after controlling for violent video game use.

METHOD

Participants

Participants in this study were 659 middle-class high school students aged 12 to 18 years from La Coruña, Spain. Mean age was 15.31 years (SD = 1.53 years), and 46.9% of participants were male.
Procedure and design

The measures were administered in the classroom, and participants were informed that the study was voluntary and that they could leave at any time without penalty. At the end of the session, participants were debriefed on the purpose of the study. Consent was obtained from both the participants and the school.

Measures

Participants answered in the following sequence questions on their video game playing habits, on antisocial aggressive behaviour, on self-transcendence, and on self-oriented social perspectives. The following measures were used:

Video game habits. Participants indicated whether they were routine computer users, how long (in years) they had been playing video games for, and how frequent they play video game in times per week.

Video game involvement. Video game involvement was measured as a composite variable based on the computer needs scale (Colwell & Payne, 2000) and the length of video game playing per session (video game playing intensity) because it is one of the most useful variables for explaining problem use (de Gracia-Blanco, Vigo-Anglada, Fernández-Pérez, & Marcó-Rabonés, 2002). In this way, we obtained a factor that included both video game use and motivation to play video games. The computer needs scale developed by Colwell and Payne (2000), based on Selnov (1984), contains 13 statements related to the motivation to use computers instead of being with other people. Participants have to show their agreement or disagreement with these statements on a 5-point scale. All items were adapted for this study by replacing the word ‘computer’ with ‘video games’ (i.e. ‘When I use video games it is like being with another person’). Length of video game playing time per session was measured on a 5-point scale, ranging from less than half an hour to over 3 hours.

Violent video gaming. To measure this variable, participants indicated the amount of violence in the video games they played and whether they perceived that a video game needed to be violent to be enjoyable on a 7-point scale, (from not at all to very much).

Antisocial aggressive behaviour. A 44-item long questionnaire on antisocial aggressive behaviour (Espinosa & Clemente, 2011) asked participants on a 4-point scale (from never to very often) whether they had committed a number of antisocial aggressive behaviours in the past 2 years. The items described direct and indirect aggressions towards people and acts of vandalising property. Direct and indirect violence are related to media use (Coyne, Archer, & Eslea, 2004), so both types of violence were relevant for this study. Direct aggression involves harmful physical or verbal confrontations with others so that the perpetrators do not try to conceal their identity or the aggression itself (i.e. ‘Arguing with someone using strong insults or physical threats’). Indirect aggression includes covert ways of harming others to avoid being discovered and social and relational violence to threaten others’ status (e.g. ‘Asking someone to do something illegal for us’). Vandalism behaviours included in the questionnaire were related to destroying property, often anonymously, without a clear intention of damaging someone in particular (e.g. ‘Pulling out or stepping on flowers or plants in a park or garden’).
Self-transcendence. Schwartz’s motivational values questionnaire (1992) measures a self-transcendence orientation. In this questionnaire, participants indicate their identification with a set of 56 value descriptions using a 9-point scale [from 7 (maximum importance) to –1 (opposed to my values)]. These values cluster into 10 types of universal motivational values, and in turn, these 10 types are organised into two orthogonal bipolar dimensions of value orientations. One dimension is openness to change versus conservation. Openness to change includes self-direction and stimulation values, and conservation includes conformity, tradition, and security values. The other dimension is self-transcendence versus self-enhancement. Self-transcendence includes universalism and benevolence values, whereas self-enhancement includes power and achievement values. The last motivational value is hedonism and is not included in any of the value orientation dimensions. Self-transcendence orientation was of particular interest in our study for its relation to prosocial and antisocial behaviour as it is an orientation that values the welfare of others over one’s own, including the understanding, appreciation, tolerance, and concern for the welfare of others and valuing things like the security of loved ones or being honest. There are 18 items in the questionnaire related to this orientation.

Self-oriented perspective. This perspective was measured by the Prosocial Tendencies Measure (PTM; Carlo & Randall, 2002). The PTM measures different prosocial tendencies (public, anonymous, dire, emotional, compliant, and altruistic), but in this study, we focused only on the public prosocial tendency scale, which is related to egocentrism and reduced and self-oriented perspective taking. Public prosocial tendency is measured in the PTM by four items: ‘I can help others best when people are watching me’, ‘When other people are around, it is easier for me to help others in need’, ‘I get the most out of helping others when it is done in front of other people’, and ‘Helping others when I am being watched is when I work best’. Answers were given on a 5-point scale, ranging from doesn’t describe me at all to describes me greatly.

An altruistic orientation, negatively correlated to public orientation \( r = -0.47, p < .001 \), could have also contributed to the explanation of the link between video games and aggression. Nevertheless, we chose to include only public prosocial tendency in the model as a measure of self-oriented perspective because as Kenny, Kashy, and Bolger (1998) proposed, mediators should be conceptually distinct and not too highly correlated.

Data analyses

Reliability analyses. Reliability analyses were performed on our data for all the scales in the study. Results for the individual scales were as follows: computer needs scale (Colwell & Payne, 2000) \( \alpha = .88 \), antisocial aggressive behaviour questionnaire (Espinosa & Clemente, 2011) \( \alpha = .97 \), self-transcendence items of the motivational values questionnaire (Schwartz, 1992) \( \alpha = .88 \), and public prosocial tendency (self-oriented perspective) of the PTM (Carlo & Randall, 2002) \( \alpha = .779 \).

Factor analyses. We created a composite variable that summarised video game involvement in participants. Bollen (2002, 2011) argued that using a composite indicator is a convenient means of summarising variables into a single factor where the latent variable has a descriptive function, as long as the composite indicator variables correspond to its definition, and this indicator is related to other latent variables as expected in the model. In the current study, a principal component analysis (PCA) was conducted on the length of
video game playing per session variable and the computer needs scale (Colwell & Payne, 2000). The Kaiser–Meyer–Olkin (KMO) measure was appropriate and verified the sampling adequacy for the analysis (KMO = .50). Bartlett’s test of sphericity, \( \chi^2(1) = 79.320, p < .001 \), indicated that correlations between items were sufficiently large for PCA. No rotation was performed because only one component was extracted. This component explained 68.24% of the variance. Item factor loadings were .826 for both variables. The resulting factor was labelled video game involvement.

In addition, a PCA was conducted on the 44 items of the antisocial aggressive behaviour questionnaire (Espinosa & Clemente, 2011) to check its factor structure with our participant’s data. The KMO measure verified the sampling adequacy for the analysis (KMO = .97). Bartlett’s test of sphericity, \( \chi^2(903) = 16,017,572, p < .001 \), indicated that correlations between items were large enough for PCA. No rotation was performed because only one component was extracted. This component explained 44.13% of the variance. Item factor loadings ranged from .47 to .74. This factor was labelled antisocial aggressive behaviour.

**Mediation analysis.** To examine the explanatory potential of self-transcendence and self-oriented perspective (public prosocial tendency) on the association between video game involvement and aggressive behaviour, a regression analysis was carried out following the multiple mediation analysis technique (Kenny et al., 1998) and using the software script and procedure described by Preacher and Hayes (2008). This procedure uses the product of coefficients to contrast total and direct effects and bootstrapping resampling (5000 resamples; 95% bias corrected confidence interval). Age and violent video game use were introduced as control variables in the model to account for their link to both video game playing and aggression. Specifically, violent video game use was included as a control in the model to partial out its effect on antisocial aggressive behaviour and to check if the total effect of video game involvement remained significant beyond the influence of violent content. Age was also included as a control variable because it is a variable usually related to aggressive behaviour. Sex did not contribute to the prediction of antisocial aggressive behaviour in our model so it was excluded.

To test the requirements for mediation, we conducted two regression analyses with video game involvement predicting each of the mediator variables and controlling for violent video game use and age. To test the rest of the criteria for mediation, the variables in the model were entered stepwise in a hierarchical multiple regression analysis predicting antisocial aggressive behaviour in the following order: video game involvement, violent video game use, age, self-transcendence, and self-oriented perspective.

**RESULTS**

**Descriptive results**

We asked participants whether they routinely used a computer, and 83.1% responded affirmatively. Most participants (68.9%) had been video game users for over 2 years. As for the frequency of play, most played either less than once a week (37.5%) or once or twice a week (30.5%). Still, 10.7% played daily, and 5.4% played more than once a day.

As for the time consumed in every gaming session, 27.1% of the participants played less than half an hour, 38.4% of participants reported playing between half an hour and an hour, 24.2% for 1–2 hours, 5.6% for 2–3 hours, and 4.7% for over 3 hours per session. There was
a correlation between frequency and length of time per gaming session of .329 (p < .001), indicating that teenagers that played more frequently also played for longer.

Participants reported a mean of 3.48 (SD = 2.04) on a 7-point scale for the degree of violence in the video games they used and a mean of 3.10 (SD = 1.77) also on a 7-point-scale for the perception that violence is necessary for a game to be enjoyable.

**Mediation analysis**

The variables in the model were moderately intercorrelated, as shown in Table 1. There was a significant correlation between both mediator variables (r = -.427, p < .001), but although this correlation was relatively high, it did not preclude their joint utilisation as mediators.

As Figure 1 shows, video game involvement, controlling for violent video game use and age, predicted self-transcendence (β = −.29, p < .001) and self-oriented perspective (β = .31, p < .001). The hierarchical multiple regression analysis (see also Table 2) indicated that self-transcendence and self-oriented perspective, controlling for violent video game use and age, predicted antisocial aggressive behaviour (self-transcendence, β = −.25, p < .001; self-oriented perspective, β = .15, p < .01). The control variables in the model were also significantly related to antisocial aggressive behaviour (violent video game use, β = .15, p < .01; age, β = −.10, p < .05). Last, the β score for video game involvement changed from .15 (p < .01) to .03 (p = ns) when both mediators were introduced, indicating a full mediation effect of self-transcendence and self-oriented perspective in the relationship between video game involvement and antisocial aggressive behaviour.

The model explained 17.5% of the variance (adjusted $R^2 = .175$, p < .001), $F(5, 475) = 21.352$, with video game involvement (Step 1) explaining 4.8% of the variance, adjusted $R^2 = .048$, p < .001, $F(1, 479) = 25.289$. Violent video game use (Step 2) increased the variance explained to 6.9%, adjusted $R^2 = .069$, p < .001, $F_{change}(1, 478) = 11.945$. Age (Step 3) explained a further 1% of the variance, adjusted $R^2 = .079$, p < .05, $F_{change}(1, 477) = 5.878$. Self-transcendence (Step 4) increased the explained variance to 15.9%, adjusted $R^2 = .159$, p < .001, $F_{change}(1, 476) = 46.632$, and finally self-oriented perspective (Step 5) contributed and additional 1.6% to the explanation of the variance, adjusted $R^2 = .175$, p < .01, $F_{change}(1,475) = 10.036$.

<table>
<thead>
<tr>
<th>Video game involvement</th>
<th>Video game involvement</th>
<th>Violent video game use</th>
<th>Self-transcendence</th>
<th>Self-oriented perspective</th>
</tr>
</thead>
<tbody>
<tr>
<td>.215**</td>
<td>.406**</td>
<td>−.319**</td>
<td>−.180**</td>
<td>−.427**</td>
</tr>
<tr>
<td>.235**</td>
<td>.296**</td>
<td>.316**</td>
<td>.184**</td>
<td>−.141**</td>
</tr>
<tr>
<td>−.359**</td>
<td>.097*</td>
<td>−.009 (ns)</td>
<td>.061 (ns)</td>
<td></td>
</tr>
</tbody>
</table>

Note: ns, not significant.
*p < .05; **p < .001.

DOI: 10.1002/casp
DISCUSSION

The results obtained were congruent with the proposed hypothesis. Self-oriented perspective and self-transcendence mediated the relationship between video game involvement and antisocial aggressive behaviour. Self-transcendence was negatively predicted by video game involvement and was also a negative predictor of aggressive behaviour, whereas video game involvement was a positive predictor of self-oriented perspective, and self-oriented perspective was also a positive predictor of antisocial aggressive behaviour. These results support our first hypothesis. Although there is a fair amount of research linking media and video games in general with antisocial behaviour, this study shows some cognitive variables that mediate this relationship, which had not been previously investigated.

Figure 1. Multiple mediation of self-transcendence and self-oriented perspective in the relationship between video game involvement and aggressive behaviour.

Table 2. Hierarchical multiple regression β scores predicting antisocial aggressive behaviour

<table>
<thead>
<tr>
<th>Predictor</th>
<th>Step 1</th>
<th>Step 2</th>
<th>Step 3</th>
<th>Step 4</th>
<th>Step 5</th>
</tr>
</thead>
<tbody>
<tr>
<td>Video game involvement</td>
<td>.22***</td>
<td>.16***</td>
<td>.15**</td>
<td>.06 (ns)</td>
<td>.03 (ns)</td>
</tr>
<tr>
<td>Violent video game use</td>
<td>.17***</td>
<td>.17***</td>
<td>.15***</td>
<td>.15**</td>
<td></td>
</tr>
<tr>
<td>Age</td>
<td>-.11*</td>
<td>-.11*</td>
<td>.15**</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Mediators</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Self-transcendence</td>
<td></td>
<td></td>
<td>-.29***</td>
<td>-.25***</td>
<td></td>
</tr>
<tr>
<td>Self-oriented perspective</td>
<td></td>
<td></td>
<td></td>
<td>.15**</td>
<td></td>
</tr>
</tbody>
</table>

Note: ns, not significant.
*p < .05; **p < .01; ***p < .001.
Our second hypothesis was also supported as video game involvement showed an association with antisocial aggressive behaviour beyond violent video game use. This result shows that even when violent video game use is controlled for, there is a relationship between video game use and antisocial aggressive behaviour.

The total amount of variance explained by the model was not large (17.5%), but it shows that video game involvement and the mediating variables are significant contributors to the prediction of aggressive antisocial behaviour. A self-oriented perspective shows a lack of actual orientation towards others as it is associated to egocentrism and self-centeredness and is a positive predictor of antisocial aggressive behaviour. Conversely, self-transcendence is an orientation that is characterised by feeling fulfilled through others’ welfare and is a negative predictor of antisocial behaviour. In turn, video game involvement is a positive predictor of self-oriented perspective and negative predictor of self-transcendence.

As noted before, we argue that the relationship between leisure habits and antisocial behaviour possibly comes from a deficit of social interaction and role-taking opportunities. A lack of role-taking and socialisation opportunities may be related to egocentric bias, a limited ability to predict the consequences of behaviour and understand the needs, desires, and intentions of others. In turn, this inability is related to antisocial behaviour (Espinosa & Clemente, 2010). In this line, our data suggest that socialisation provided by video games is related to a restricted social perspective and egocentrism. Egocentrism is characterised by the inability to understand only the most immediate consequences of one’s own behaviour. This may be most true in the absence of other sources of socialisation that may provide an effective counterbalance. It appears that video game playing may be related to reduced chances for social interaction. Many children start playing computer games at a very early age, and if video game playing or other media is a substitute for time in the company of peers or for other leisure activities involving groups, as time displacement hypothesis suggests, it may become the main source for children’s socialisation. The interaction provided by many computer games is very simplified, even in the most complex network games. The gamer just has to take into account the consequences for him or her or maybe for another player (computer controlled or not) in quite complex strategy games. Conflict resolution is harsh and swift in many of these games (often includes eliminating an opposed party), and long-term consequences are irrelevant. This level of interaction in computer games matches the social perspective of Kohlberg’s (1992) preconventional stages of moral development, characterised by a dominating egocentric bias. Thus, a child or teenager, whose main source of interaction is his or her computer, would not advance much in his or her social perspective and would only acquire limited problem-solving patterns (Huesmann, Moise-Titus, Podolski, & Eron, 2003). This is consistent with the hypothesis that exposure to video games may be related to aggression, regardless of whether the contents of video games are violent or not.

Violence in video games has its own specific effects on behaviour, but there is evidence that the amount of video game playing, regardless of content, also has an important effect via the social perspective of the child and adolescent. Regarding violence in the media, it has been controvertibly argued (Ferguson, 2007, 2011) that there are only small differences in aggressive behaviour between violent media users and other people. These small differences may happen because both violent media users and comparison groups may be high global media users. Because a high amount of media use may be related to a detrimental effect on socialisation regardless of contents, both types of groups may be more similar than initially expected. Thus, when researching on the effects of violent media, it may be useful to control for global media use or proportion of media use versus other leisure and socialisation activities.
Mediation is often assessed in cross-sectional studies to understand the interactions between variables in a model, but correlational research is unable to test causation. The concurrent nature of our data does not allow to draw causal conclusions, so we cannot exclude other possibilities to explain the proposed association between the variables in our study. Nevertheless, mediation models are still useful in correlational studies for predictive purposes and to test the role of mediator variables. Another limitation for this study was that data were obtained through self-reports, and we cannot rule out that participants have underestimated the violent content of the games they played, especially aggressive teenagers, or that high video game users underestimate the time they spend with games.

Because we argue that the link between video games and aggression is related to socialisation and role-taking issues, an additional limitation that should be addressed in future studies is that we did not include a measure of social interaction to check if participants high in video game use were indeed low in social interaction. Most importantly, longitudinal and experimental studies on this topic are needed to check the directionality of the relationship between video game involvement and aggression.

To summarize, the kind of leisure activities the adolescent engages in, and particularly video game playing because it is a powerful source of socialisation and learning model (Gentile & Gentile, 2008), could be related to an underdeveloped and self-centred social perspective. Parents and educators must be aware of the risks of excessive media exposure for children and the need to provide alternatives of socialisation. Today’s adults have been socialised in a much richer environment, and their involvement with the media (particularly computers and the Internet) started once they were already socialized. Modern children interact with the media from a much earlier age, and they grow up more isolated from other sources of socialisation, with a potential greater risk of developing dysfunctional and antisocial cognitions and behaviours.

ACKNOWLEDGEMENT

The authors acknowledge the reviewers and editors for their useful and insightful comments and suggestions to improve the manuscript.

REFERENCES


