

# **I Wish I Were a Warrior: The Role of Wishful Identification in the Effects of Violent Video Games on Aggression in Adolescent Boys**

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Running head: WISHFUL IDENTIFICATION WITH VIOLENT VIDEO GAME  
CHARACTERS

**I Wish I Were a Warrior: The Role of Wishful Identification in the Effects of Violent Video  
Games on Aggression in Adolescent Boys**

**Abstract**

This study tested the hypothesis that violent video games are especially likely to increase aggression when players identify with the violent game characters. Dutch adolescent boys with low education ability ( $N = 112$ ) were randomly assigned to play a realistic or fantasy violent or nonviolent video game. Next, they competed with an ostensible partner on a reaction time task in which the winner could blast the loser with loud noise through headphones (the aggression measure). Participants were told that high noise levels could cause permanent hearing damage. We controlled for habitual video game exposure, trait aggressiveness, and sensation seeking. As expected, the most aggressive participants were those who played a violent game and wished they were like the violent character in the game. These participants used noise levels loud enough to cause permanent hearing damage to their partners, even though their partners had not provoked them. These results show that identifying with violent video game characters makes players more aggressive. Players were especially likely to identify with violent characters in realistic games and with games they felt immersed in.

Keywords: aggressive behavior, wishful identification, media violence, violent video games, realism, immersion, adolescent boys

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*My villain, my hero you mean. I always  
think of my murderers as my heroes.*

— *Samson Raphaelson*

Children today are looking for heroes or role models to look up to, in the real world and increasingly in the mediated world. Adolescents are especially likely to look for role models to identify with because they are in the process of developing their own identities. Adolescence is a time to experiment with different roles (Erikson, 1968, p.156; Keniston, 1971, p.8). Media figures play an important part in this developmental process, because they offer a variety of possible selves that adolescents can experiment with (Giles & Maltby, 2004; Griffiths, Davies, Chappel, 2004; Oyserman, Bybee, Terry, & Hart-Johnson, 2004). Adolescent boys who look to the mass media for role models will find plenty of tough male warriors, who solve problems using aggression, show no remorse for their aggressive actions, and are rarely punished for behaving aggressively (National Television Violence Study, 1998; Carnagey & Anderson, 2004; Dietz, 1998). In general, early and middle adolescents (ages 11-17) are more susceptible to being influenced than others are (Dahl & Hariri, 2005). Furthermore, they may be more vulnerable to the influence of violent characters in the mass media than others because they find antisocial behavior more appealing (Arnett, 1992), they are more likely to identify with deviant models and they are more likely to experiment with “forbidden” behaviors (Moffitt, 1993; Moffitt, Caspi, Dickson, Silva, & Stanton, 1996). However, only a few studies have assessed the influence of violent video games on aggression during early and middle adolescence (Kirsch, 2003).

Male adolescents with lower educational ability may be especially vulnerable because they are more likely than others to consume violent media and are also more likely to engage in aggressive behavior (see Bushman & Huesmann, 2001, for a review). Most media violence experiments have used college students; hardly any have used lower educated adolescents. Therefore, in the present study, we tested adolescent boys (ages 12-17) with lower educational ability.

### ***Violent Heroes and Aggression***

Recent meta-analyses showed that violent video games, like violent television programs and films, can increase aggression (Anderson, 2004; Anderson & Bushman, 2001; Huesmann, Moise-Titus, Podolski, & Eron, 2003). Several factors may increase media-related aggression in vulnerable populations. One such factor is identification with violent characters. Identifying with a violent TV character is associated with aggression in the short run (Funk, Baldacci, Pasold, & Baumgardner, 2004; Leyens & Picus, 1973; Perry & Perry, 1976) and in the long run (Huesmann & Eron, 1986; Huesmann, et al., 2003). However, few studies have investigated the effects of identifying with violent video game characters (Schneider, Lang, Shin, & Bradley, 2004; Tamborini, Eastin, Lachlan, Skalski, Fediuk, & Brady, 2004).

The interactive features of video games encourage players to identify with violent characters. TV and film viewers simply watch violent characters. Video game players, however, must take the perspective of the violent character in order to play the game. The current study investigated whether playing violent video games is more likely to increase aggression in adolescent boys who identify with violent characters than in adolescent boys who do not.

### ***Wishful Identification***

Social learning theory emphasizes the importance of observing and modeling the behaviors, attitudes, and emotional reactions of others (Bandura, 1973, 2001). Contemporary media fare offers a large variety of role models to imitate. Adolescents might select models that possess qualities they already have (i.e., similar models), or models that possess qualities they do not have, but wish they had — ‘real heroes’ they can look up to (Bandura, 1986; Huesmann & Eron, 1986; Hoffner & Cantor, 1991; Oyserman, 2004). Of the two types of models, we believe that adolescents are most attracted to the ‘real heroes’ with power and charisma in the media. For males, such ‘real heroes’ are often tough, aggressive men with guts and glory. Identifying with these ‘real heroes’ may also help boys feel more independent and mature (Arnett, 1992; Keniston, 1971; Moffitt, 1993; Zillmann, 1998).

A distinction has been made between ‘similarity identification’ and ‘wishful identification’ (Von Feilitzen & Linné, 1975). In ‘similarity identification,’ the observer identifies with the character because they share salient characteristics. Most identification conceptions in media effects research are based on similarity, although identification is often measured as general ‘liking’ of a character (Cohen, 2001; Konijn & Hoorn, 2005; Zillmann, 1994). In ‘wishful identification,’ the observer desires to emulate the character, either in general terms (as a role model for future action or identity development) or in specific terms (extending responses beyond the viewing situation or imitating a particular behavior) (Hoffner & Buchanan, 2005; Hoffner & Cantor, 1991; Von Feilitzen & Linné, 1975). Actually, ‘wishful identification’ is closer to the concept of vicarious learning (Bandura, 1986) than ‘similarity identification’ is. Wishful identification provides a glimpse of ‘what if,’ and these glimpses are powerful predictors of future behavior, especially in adolescents (Cohen, 2001). Boys are generally rewarded for being tough, brave, competitive, and aggressive (Epstein, Kehily, Mac an Ghail,

& Redman, 2001; Piko, Keresztes, & Pluhar, 2006). Therefore, adolescent boys may wish to be like the tough heroes in violent video games. Adolescent boys who wishfully identify with violent heroes may be more likely than others to imitate them and behave more aggressively after the game is over.

### ***When Heroes Become Attractive Role Models***

Adolescent boys are the most devoted players of violent games (Gentile, Lynch, Ruh, Linder, & Walsh, 2004). Several factors might encourage adolescent boys to identify with some game characters over others. In the following sections, we argue that game characteristics (i.e., how violent and realistic the game is) and player characteristics (i.e., aggressiveness and sensation seeking) may play a role.

***Game characteristics: Level of violence and realism.*** Given the popularity of violent games over nonviolent ones (Dietz, 1998; Funk & Buchman, 1996; Gentile et al., 2004) and the appeal of antisocial behavior and deviant models for adolescents in the stage of identity-formation (Arnett, 1992; Keniston, 1971; Moffitt, 1993), we expected that adolescent boys would have a greater desire to be like violent characters than nonviolent characters. In addition, violent characters in video games usually are in control of the risky situations they encounter and act as independent heroes. Therefore, these characters might be attractive to adolescents, who strive for independence and maturity (Moffitt, 1993; Moffitt et al., 1996). In developing their identity, adolescent boys who take ideals of what ‘real men’ are like from the media may use these ideals to guide their own behavior (Epstein et al., 2001; Greenberg, Siemicki, Dorfman, et al., 1986; Phoenix & Frosh, 2001). In video games, ‘real men’ are not ‘sissies’ — they are tough and aggressive.

Recent trends in video production and technical developments have made video games more lifelike and realistic (Carnagey & Anderson, 2004). Maximizing realism in visual media is generally used as a means to evoke “total immersion” (Hoorn, Konijn, & Van der Veer, 2003; Konijn & Hoorn, 2005). Players rate realistic video games more favorably than unrealistic ones (Griffiths & Hunt, 1995; Wood, Griffiths, Chappell, & Davies, 2004). We therefore predicted that realism and immersion would increase the likelihood that players will identify with the heroes in the games.

***Player characteristics: Trait aggressiveness and sensation seeking.*** Trait aggressiveness and sensation seeking usually peak during adolescence and diminish in adulthood (e.g., Slater, Henry, Swaim, & Anderson, 2003). Television and film studies show that aggressive adolescents are more susceptible to media violence than are nonaggressive adolescents (Bushman & Huesmann, 2001). Individuals high in sensation seeking like danger and taking risks, because it is a thrilling experience for them, satisfying and reinforcing (Zuckerman, 1994). Violent video games are filled with danger and risks. Early adolescence is a time of increased risk-taking and novelty seeking (Kirsch, 2003). It is therefore reasonable to expect that adolescent males high on those traits will be especially likely to identify with violent video game characters as a way of vicariously obtaining satisfaction through thrills and anti-social behavior.

### ***Overview of the present study***

Participants were randomly assigned to play one of four types of video games: (1) violent-realistic, (2) violent-fantasy, (3) nonviolent-realistic, or (4) nonviolent-fantasy. After playing the game, participants competed with an ostensible partner on a reaction time task in which the winner could blast the loser with loud noise through a pair of headphones. The intensity of noise participants selected for their “partner” was used as a measure of aggression.

We predicted that participants who played a violent game would behave more aggressively (by blasting their partner with loud noise) than would participants who played a nonviolent game, especially if they wishfully identified with the violent game character and if the game was realistic and immersive. Sensation seeking, trait aggressiveness, and habitual exposure to video games were treated as potential moderators.

## Method

### *Selection of Video Games*

A separate group of boys ( $N = 102$ ,  $M$ -age = 15,  $SD = 1.13$ ), comparable to those in the primary experiment, was used to select 12 video games from a list of 52 games. For each game, they rated how violent and realistic it was, and how much they liked to play it. Ratings were made on 10-point scales (1=*not at all* to 10=*extremely*). From the pool of 52 games, we selected three violent-realistic games (*America's Army*, *Killzone*, *MaxPayne*), three violent-fantasy games (*Doom3*, *Quake*, *Metroid Prime*), three nonviolent-realistic games (*Pro Evolution Soccer*, *SIMS2*, *Tony Hawks*), and three nonviolent-fantasy games (*Mario Kart*, *Mario Sunshine*, *Final Fantasy*). We selected three games of each type to increase the generalizability of findings (Wells & Windschitl, 1999). Violence ratings were higher for the violent than for the nonviolent games, and realism ratings were higher for the realistic than for the fantasy games. The 12 games were matched in terms of how much participants liked to play them (Figure 1).

### *Participants*

Participants were 112 boys from Dutch VMBO-classes (parental consent=100%). The Dutch middle school system uses standardized tests to divide students into different educational



ability levels. VMBO is the lowest level. The highest percentage of low income students are also found in VMBO schools.

Thirteen participants were discarded (4 did not follow instructions and 9 did not understand how to play the video game). Thus, the data from 99 boys ( $M$ -age = 14.0;  $SD$  = 1.05) were analyzed.

### ***Individual Difference Questionnaire***

Two weeks prior to the experiment proper, participants completed a questionnaire that contained measures of trait aggressiveness, sensation seeking, and video game exposure. *Trait aggressiveness* was measured using the 9-item physical aggression subscale of the Aggression Questionnaire (Bush & Perry, 1992; Cronbach's  $\alpha$  = .84). Sample items are, "If somebody hits me, I hit back." and "If I have to resort to violence to protect my rights, I will." *Sensation seeking* was measured using the 2-item scale recommended by Slater et al. (2003; Cronbach's  $\alpha$  = .73): "I like to do risky things, even if they are dangerous" and "I sometimes do dangerous things, just for fun." The *video game exposure* measure asked how many hours per week participants spent playing video games.

### ***Procedure***

Participants were tested individually. They were randomly assigned to play one of 12 pre-selected games. After playing a video game for 20 minutes, they completed a competitive reaction time task against an ostensible partner of the same sex (Taylor, 1967). Participants were told that they and their ostensible partner would have to press a button as fast as possible on each of 25 trials, and that whoever was slower would receive a blast of noise through a pair of headphones. Participants set the level of noise their partner would receive in advance between 60 dB (*Level 1*) and 105 dB (*Level 10*, about the same volume as a smoke alarm). A no-noise level

(*Level 0*) was also provided. They were told that levels 8, 9, and 10 could cause permanent hearing damage to their partner. Of the 25 trials, the participant won 12 (randomly determined). As in our previous research (e.g., Bushman & Baumeister, 1998), we were primarily interested in the intensity of noise that participants set for their “partner” on the first trial of the task. The first trial provides a measure of unprovoked aggression because the partner had not delivered any noise to the participant yet. After the first trial, aggression converged on what participants believed their partner had done (i.e., tit-for-tat responding). This is consistent with many findings that confirm the importance of reciprocation norms in determining levels of aggressive behavior (Axelrod, 1982).

Basically, within the ethical limits of the laboratory, participants controlled a weapon that could be used to blast their partner. The level of experimental realism of the study was very high as indicated by comments participants made to the experimenter during the debriefing (e.g., “I blasted him with level 10 noise because he deserved it, I know he can get hearing damage, but I don’t care!”).

Occasionally, aggression research is faulted for using laboratory procedures that are “artificial” or “unrepresentative” of “real-life” aggression. The validity of laboratory aggression procedures (including our noise blast procedure) has been validated by results from two meta-analyses. One meta-analysis showed impressive levels of convergence across a wide range of laboratory aggression measures (Carlson, Marcus-Newhall, & Miller, 1989). The other meta-analysis showed that “real” and laboratory measures of aggression are influenced in similar ways by situational variables (e.g., alcohol, provocation) and by individual difference variables (e.g., trait aggressiveness, gender) (Anderson & Bushman, 1997).

After completing the reaction-time task, participants completed several rating scales. A 4-item scale (e.g., “I wish I were a character such as the one in the game”) was used to measure

*wishful identification* with the main character in the video game (Von Feilitzen & Linné, 1975; Cronbach's  $\alpha=.77$ ). A 3-item scale (e.g., "While playing, I completely forgot my surroundings") was used to measure *immersion* level (Schubert, 2003; Cronbach's  $\alpha=.69$ ). A 4-item scale (e.g., "The characters in the video game act like people in the real world act") was used to measure *realism* (Konijn et al., 2004; Cronbach's  $\alpha=.79$ ). All items were rated on 5-point scales, where 0=*never*, 1=*hardly ever*, 2=*sometimes*, 3=*regularly*, and 4=*often*.

Next, participants rated the video game they had played on several dimensions (i.e., violence level, frustration level, likeability of the game, previous experience with the game). Items were rated on 10-point scales (1=*not at all* to 10=*extremely*). The ratings were used as manipulation checks. Finally, participants were probed for suspicion and debriefed. None of the participants expressed suspicion about the study.

## Results

### *Preliminary Analyses*

***Exemplars of video games.*** To increase the generalizability of findings, we included three exemplars of each type of video game (Wells & Windschitl, 1999). There were no significant differences among the three realistic violent games, among the three unrealistic violent games, among the three realistic nonviolent games, and among the three unrealistic nonviolent games on aggressive behavior (all  $p$ s > .65). Thus, the data were collapsed across exemplars of video game types for subsequent analyses.

***Video game ratings.*** As expected, violent games were rated as more violent ( $M = 2.33$ ,  $SD = 1.20$ ) than the nonviolent games ( $M = 0.63$ ,  $SD = 1.03$ ),  $F(1,95)=51.73$ ,  $p < .0001$ ,  $p\text{-rep} > .99$ ,  $\eta_p^2 = .35$ ,  $d=1.46$ . The  $p\text{-rep}$  value gives the probability of replicating the effect (Killeen,

2005). In this case, there is at least a 99% chance of replicating the finding that violence ratings were higher for violent video games than for nonviolent games. Realistic games were rated as more realistic ( $M = 2.15$ ,  $SD = 0.76$ ) than the fantasy games ( $M = 0.99$ ,  $SD = 0.77$ ),  $F(1,95) = 50.55$ ,  $p < .0001$ ,  $p\text{-rep} > .99$ ,  $\eta_p^2 = .35$ ,  $d = 1.46$ . The games did not differ in how much participants wanted to play them, how much participants had played them in the past, and how frustrating they were (all  $p$ s  $> .2$ ). These findings are consistent with those obtained in our pilot study using a different sample of participants.

### **Primary Analyses**

Data were analyzed using hierarchical regression analysis. Main effects were entered in Step 1 (i.e., violent vs. nonviolent game, realistic vs. fantasy game, wishful identification, trait aggressiveness, sensation seeking, previous video game exposure and immersion) and two-way interactions were entered in Step 2. Step 1 of the analysis showed two significant main effects and a trend. Participants who played a violent game were more aggressive than those who played a nonviolent game,  $t(91) = 2.35$ ,  $p < .03$ ,  $p\text{-rep} > .90$ ,  $b(SE_b) = 0.97(0.42)$ ,  $\beta = .24$ ,  $d = 0.49$ . In addition, sensation seeking was positively related to aggression,  $t(91) = 2.06$ ,  $p < .05$ ,  $p\text{-rep} > .87$ ,  $b(SE_b) = 0.47(0.23)$ ,  $\beta = .21$ , and higher levels of wishful identification tended to be positively related to aggression,  $t(91) = 1.75$ ,  $p < .08$ ,  $p\text{-rep} > .84$ ,  $b(SE_b) = 0.36(0.20)$ ,  $\beta = .18$ .

As predicted, the main effects of violence and wishful identification were qualified by the significant interaction between these two variables in Step 2 (see Table 1). Simple effects analyses showed that wishful identification with the main characters in violent games was significantly related to aggression,  $t(62) = 3.09$ ,  $p < .003$ ,  $p\text{-rep} > .97$ ,  $b(SE_b) = 0.68(0.22)$ ,  $\beta = .37$  (see Figure 2). Note, in Figure 2, that participants who strongly identified with violent video game characters exceeded level 8 noise, even though they were told that noise levels 8-10 could

possibly damage their “partner’s” ears. Wishful identification with the main characters in nonviolent games was not significantly related to aggression,  $t(33)=1.16$ ,  $p > .25$ ,  $p\text{-rep} < .69$ ,  $b(SE_b)=-0.38 (0.33)$ ,  $\beta=-.20$  (see Figure 2).

Although realism and immersion did not influence aggressive behavior, they did influence wishful identification. If the game was realistic, and if players felt immersed in the game, then they identified more with game characters (see Table 2).

### **Discussion**

Previous research has already shown that violent video games increase aggression in players (e.g., Anderson & Bushman, 2001). Our results go beyond previous findings in specifying some factors that increase violent video game effects. As expected, the most aggressive participants in our study were those who played a violent game and wished to be like the violent character in that game. These results are consistent with social learning theory (Bandura, 1986), with social cognitive theory (Anderson & Huesmann, 2003; Carnagey & Anderson, 2004), and with developmental theory (Bushman & Huesmann, 2001; Kirsch, 2003; Moffit et al., 1996). Males in early to middle adolescence and of low educational ability are susceptible to violent video game effects. Participants were especially likely to identify with characters when the games were realistic, and when they felt immersed in the game. These results are also in line with previous theorizing (e.g., Carnagey & Anderson, 2004; Schubert, 2003).

Not all of our hypotheses were confirmed, however. We also expected that individuals who were characteristically aggressive and were sensation seekers would be more likely than others to identify with violent characters. Although we did find an increased level of aggression

in sensation seekers, the predicted interaction was not significant. Statistical power to detect three-way interactions might have been too low in our study.

Our study, like any study, has limitations. We just measured aspects of identification, which limits our ability to make causal inferences. Because we controlled for initial level of aggressiveness and sensation seeking, however, we can rule out the alternative explanation that aggressive players identify more with violent video game characters (the correlation between trait aggressiveness and wishful identification was not significant,  $r = .11$ ,  $p > .38$ ,  $p\text{-rep} < .59$ ). Future research should experimentally manipulate the level of identification more directly, such as by varying salient characteristics of the violent characters (e.g., their attractiveness). This is important because wishful identification with violent characters is the opposite of empathy for violence victims. If players would focus attention on the victims rather than on the perpetrators of violence, the detrimental effects of violent video games might be reduced (cf. Cantor & Wilson, 2003; Nathanson & Cantor, 2000). Future research should also investigate the role of empathy on violent video game effects. Although game realism and immersion influenced wishful identification they did not influence aggression levels (the correlation between perceived realism of the game and immersion was not significant,  $r = .13$ ,  $p > .21$ ,  $p\text{-rep} < .72$ ). Future research should examine the roles of realism and immersion in violent video game effects.

We have argued that adolescent males with lower educational ability are especially likely to identify with violent characters because they consume more violent media than others, and may therefore turn to violent media characters in an attempt to develop their own identities. We did not, however, test this hypothesis directly by comparing these adolescent males with other groups. Future research may compare males and females of different ages and educational ability levels. A developmental perspective is crucial to understand the influence of violent video games on aggression (Kirsch, 2003), especially since antisocial and norm-violating behaviors are rising

among youth (Piko et al., 2006). Furthermore, interventions are most successful when they are developmentally appropriate (Frick, Cornell, Bodin, Dane, Barry, & Loney, 2003).

In conclusion, to our knowledge, ours is the first study to show that violent video games are especially likely to increase aggression when players wishfully identify with violent game characters. Boys in our study who identified strongly with violent characters were willing to administer noise loud enough to permanently damage the ears of another boy who had done nothing to anger them (Figure 2). Wishful identification was strongest for realistic games and for games in which the boys felt immersed. Comments participants made during the debriefing are illustrative. One boy said he liked the violent game he played “because in this game you can override people, kill people and shoot people, and I want to do that too.” Another boy said: “I like Grand Theft Auto a lot because you can shoot at people and drive fast in cars. When I am older I can do such things too. I would love to do all these things right now!” Wishfully identifying with violent characters in the virtual world can influence adolescents to behave more aggressively against others in the real world.

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Table 1

*Results of a Hierarchical Regression Analysis (Step 2) of Type of Game (Violent vs. Non-violent and Realistic vs. Fantasy games), Wishful Identification, Immersion, Trait Aggressiveness, Sensation Seeking, and General Exposure to Video Games on Intensity of Aggression (Noise Blasts in a Competitive Reaction Time Task).*

Variable	<i>t</i>	<i>p</i>	<i>p-rep</i>	<i>b (SE<sub>b</sub>)</i>	$\beta$
Violence (factor)	0.94	.35	.61	1.62 (1.72)	.41
Realism (factor)	1.16	.25	.68	1.36 (1.17)	.36
Wishful Identification	3.24	.002	<b>.98</b>	2.01 (0.62)	1.04
Immersion	-0.93	.36	.60	-0.57 (0.62)	-.29
Trait Aggressiveness	0.94	.35	.61	0.77 (0.82)	.31
Sensation Seeking	1.00	.32	.63	0.70 (0.70)	.32
Game Exposure	-0.60	.55	.47	-0.24 (0.40)	-.18
Violence x Realism	-1.44	.15	.77	-1.18 (0.82)	-.65
Violence x Wishful Identification	-2.88	.005	<b>.97</b>	-1.32 (0.46)	-1.08
Violence x Immersion	0.72	.47	.52	0.32 (0.44)	.26
Violence x Trait Aggressiveness	-1.17	.25	.68	-0.77 (0.66)	-.40
Violence x Sensation Seeking	-0.40	.69	.36	-0.22 (0.53)	-.14
Violence x Game Exposure	0.22	.82	.26	0.06 (0.28)	.07

*Note.*  $R^2$  Step 1 = .16,  $R^2$  Step 2 = .25.

Table 2

*Results of a Hierarchical Regression Analysis of Type of Game (Violent vs. Non-violent and Realistic vs. Fantasy games), Immersion, Trait Aggressiveness, and Sensation Seeking on Intensity of Wishful Identification.*

<i>Variable</i>	<i>t</i>	<i>p</i>	<i>p-rep</i>	<i>b (SE<sub>b</sub>)</i>	<i>β</i>
Violence	1.26	.21	.72	0.26 (0.21)	.13
Realism	3.02	<b>.003</b>	.97	0.58 (0.19)	.29
Immersion	3.10	<b>.003</b>	.97	0.30 (0.10)	.30
Trait Aggressiveness	0.24	.81	.27	0.03 (0.13)	.02
Sensation Seeking	0.09	.93	.15	0.01 (0.12)	.01

*Note.* The factors Violence and Game-Realism were entered in Step 1, immersion in Step 2, the personality traits in Step 3.  $R^2$  Step 1 = .06,  $R^2$  Step 2 = .15,  $R^2$  Step 3 = .15.



### Figure Captions

*Figure 1.* Participant ratings of how violent, how realistic, and how much they wanted to play each type of video game. Capped vertical bars denote  $\pm 1 SE$ .

*Figure 2.* Relationships between wishfully identifying with violent and nonviolent characters in video games and aggression levels. Aggression was defined as the level of noise participants set for their ostensible partner on the first trial of the competitive reaction time task (before they had heard any noise themselves). Noise levels ranged from level 1 (60 dB) to level 10 (105 dB), in 5 dB increments. A non-aggressive no noise option was also given (level 0), although no boy chose level 0. Participants were told that levels 8-10 could cause permanent hearing damage to their “partner.” Note that participants who strongly wished they were like violent video game characters exceeded level 8 noise, even though it could have permanently damaged their ostensible partner’s ears.



