

ORIGINAL ARTICLE

**Lessons From Markey et al. (2015)
and Bushman et al. (2015): Sensationalism
and Integrity in Media Research**

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This article presents a response to the comment by B. J. Bushman, D. Romer, and P. E. Jamieson (2015). This reply addresses 2 issues raised by the commenters. First, they claim they and others have not made sensationalistic statements linking violent media to horrific acts of real-world violence. In response, we supply numerous examples of sensationalistic statements made by them and others. Second, they claim they did not expect violence in films to be related to violent behavior among adults, but only among youths. However, by examining homicide arrests and homicide gun mortality rates among youths, we found that as films have become increasingly violent over time, both homicide arrests and gun-related homicides have tended to decrease among this age group.

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Sensationalism (noun) — The use of exciting or shocking stories or language at the expense of accuracy, in order to provoke public interest or excitement

— The Oxford English Dictionary (2014)

We thank Bushman, Romer, and Jamieson (2015) for taking the time to comment on our article *Violent Movies and Severe Acts of Violence: Sensationalism Versus Science* (Markey, French, & Markey, 2015). We believe an open dialogue is the best way to address the differences that exist between scientists on both sides of the debate concerning the role of the media in real-world violence. In their thoughtful article, the commenters raise two main issues. First, they argue that we mistook statements they and other researchers have made in the past as sensationalism when, in fact, they were “merely stating” potential hypotheses. To this end, they challenge us to supply

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“clear examples” of sensationalistic statements. Second, by examining a dataset related to youth violence the commenters now claim to have found that “. . . gun violence in youth are actually consistent with violence trends in movies” (p. 174). In order to clarify these issues for the readers and these commenters we directly address each below.

Sensationalistic statements

The commenters argue that they and other researchers do not make sensationalistic claims in their research or during media interviews. We find this bold claim surprising considering the very first paragraph of their research article *Gun Violence Trends in Movies* (Bushman, Jamieson, Weitz, & Romer, 2013), which prompted our original research article, begins with a macabre discussion of the horrific events that occurred in Aurora, CO when an adult, James Holmes, killed 12 individuals in a crowded movie theater (see Table 1). As their study did not examine *any* negative effects of violent media and Bushman et al. now appear to agree that the Aurora, CO shooting (which was committed by an adult) is not relevant to their study or their studies hypotheses, we see little purpose of such an introduction except as an attempt to provoke interest and convey the importance of their study by presenting a ghastly introduction.

Such a sensationalistic beginning might be defensible if it only occurred in the case of one or two research articles. However, as we pointed out in our original paper, there are numerous examples of similar occurrences by many media researchers. Table 1 displays a nonexhaustive list of some other questionable statements made by media scholars. These statements are sensationalistic because they exploit actual horrific events in order to provoke interest in these scholars’ research even though none of these studies examined outcomes remotely related to school shootings and violent rampages. For example, Anderson and Dill (2000) are correct that Eric Harris and Dylan Klebold did assault Columbine High School in Littleton, CO, murdering 13 and wounding 23 before turning the guns on themselves. However, their study did not investigate violent outcomes; it instead related media effects to various self-report assessments of mood, such as irritability (e.g., “I think I have a lot of patience,” “When I am right, I am right,”) and the likelihood participants would expose a hypothetical person to an irritating noise. In a similar manner, Krahe and Möller (2004) were accurate in reporting that Germany was shocked by a school shooting in which 17 people, including the shooter, were killed. Nevertheless, it is overstepping to suggest that such horrific events are related in any meaningful way to the outcome variables assessed in their study—endorsing items such as “To spread rumors about someone is totally ok” and “To tell lies about other people is totally ok.” Discussions about graphic acts of real-world violence in these contexts are sensationalistic because they only serve to excite the reader’s interest by falsely suggesting these studies provide insight into predictors of these horrific acts.

We were equally surprised that Bushman et al. argued that they and other scholars do not “say behaving aggressively after exposure to violent media is comparable to

Table 1 Examples of Sensationalistic Statements Made by Media Scholars

Citation	Source	Quote
Bushman et al., 2013	Research Article, opening paragraph to study examining trends in violent films.	In many shooting sprees, the perpetrator puts on a uniform (e.g., hockey mask, trench coat, movie costume, military uniform), as if following a script from a movie. For example, on July 20, 2012, James Holmes bought a ticket to see the new Batman movie in Aurora, Colorado. Approximately 20 minutes after the show started, Holmes left the theater and returned dressed in full tactical gear, carrying several guns and a huge amount of ammunition. He launched 2 canisters that emitted smoke or gas and then began firing into the crowd, killing 12 and wounding 70 others. Holmes identified himself to the police as “The Joker.” (p. 1015)
Gentile & Anderson, 2003	Book Chapter	If one wanted to learn how to kill someone, one would quickly realize that there are many steps involved. At a minimum, one needs to decide whom to kill, get a weapon, get ammunition, load the weapon, stalk the victim, aim the weapon, and pull the trigger. It is rare for television shows or movies to display all of these steps. Yet, violent video games regularly require players to practice each of these steps repeatedly. This helps teach the necessary steps to commit a successful act of aggression. (p. 135)
Gabbadini, Riva, Andrighetto, Volpato, & Bushman, 2014	Research Article	On Sunday afternoon, on April 10, 2013, two 15-year-old girls from Udine, Italy, went to a supermarket to buy alcohol. They hitchhiked on the road and were picked up by a 67-year-old man, who drove them to the outskirts of the city. After reaching an open field, the two girls killed the man, took his wallet, and left him in the field. An autopsy later found that the man had been in a “prolonged and violent” fight before he died; two of his ribs were broken. The two girls stole his car and fled, driving high speeds on the highway for 64 km (40 miles), even though neither girl had a driver’s license. When the police caught and questioned the two girls, one said, “I felt like I was playing GTA (Grand Theft Auto), I felt like the hero of the game” (p. 451).

Table 1 Continued

Citation	Source	Quote
Centerwall, 1992	Research Article	<p>... the introduction of television in the 1950s caused a subsequent doubling of the homicide rate, that is, long-term childhood exposure to television is a causal factor behind approximately one half of the homicides committed in the United States, or approximately 10,000 homicides annually. . . if, hypothetically, television technology had ever been developed, there would today be 10,000 fewer homicides each year in the United States, 70,000 fewer rapes, and 700,000 fewer injurious assaults (p. 3061).</p>
Bushman & Anderson, 2001	Research Article	<p>Suppose 10 million people watch a violent TV program. If only 1% of the viewers will become more aggressive afterward, then the violent TV program will make 100,000 people more aggressive! Because so many people are exposed to violent media, the effect on society can be immense even if only a small percentage of viewers are affected by them. It takes only one or two affected students to wreak murderous havoc in a school, as demonstrated in recent years in Jonesboro, Arkansas; West Paducah, Kentucky; Pearl, Mississippi; Stamps, Arkansas; Springfield, Oregon; Littleton, Colorado; and Santee and El Cajon [sic], California. (p. 482)</p>
Anderson & Bushman, 2001	Research Article	<p>Paducah, Kentucky, Jonesboro, Arkansas, Littleton, Colorado. These three towns recently experienced similar multiple school shootings. The shooters were students who habitually played violent video games. Eric Harris and Dylan Klebold, the Columbine High School students who murdered 13 people and wounded 23 in Littleton, before killing themselves, enjoyed playing the bloody video game Doom. Harris created a customized version of Doom with two shooters, extra weapons, unlimited ammunition, and victims who could not fight back — features that are eerily similar to aspects of the actual shootings. (p. 353)</p>

Table 1 *Continued*

Citation	Source	Quote
Anderson & Dill, 2000	Research Article	On April 20, 1999, Eric Harris and Dylan Klebold launched an assault on Columbine High School in Littleton, Colorado, murdering 13 and wounding 23 before turning the guns on themselves. Although it is impossible to know exactly what caused these teens to attack their own classmates and teachers, a number of factors probably were involved. One possible contributing factor is violent video games. Harris and Klebold enjoyed playing the bloody, shoot-em-up video game <i>Doom</i> , a game licensed by the U.S. military to train soldiers to effectively kill. (p. 772)
Gentile & Anderson, 2003	Book Chapter	If health video games can successfully teach health behaviors, and flight-simulator video games can teach people how to fly, then what should we expect violent, murder-simulating games to teach? (p. 146)
Anderson & Bushman, 2002	<i>Science</i> magazine	[Interventions] are needed because a heavy diet of media violence contributes to a societal violence rate that is unnecessarily obese. (p. 2379)
Bushman & Anderson, 2002	Research Article	Recent school shootings (e.g., Columbine High) and the September 11, 2001, terrorist attacks on the World Trade Center and Pentagon have refueled the long-standing debate about the effects of exposure to media violence. Although this debate appears unresolved in the public arena, the scientific literature leaves little doubt about the effects of media violence on aggression behavior. (p. 1679)
Anderson & Bushman, 2001	Research Article	These results clearly support the hypothesis that exposure to violent video games poses a public-health threat to children and youths, including college-age individuals. (p. 358)
Strasburger et al., 2014	Research Article	Again, epidemiologically speaking, they (violent media) may contribute 10% to 20% to any given problem; but that is a considerable amount given that we potentially have more control over media than other risk factors (e.g., poverty, low IQ, mental illness). (p. 571)

Table 1 *Continued*

Citation	Source	Quote
Centerwall, 1992	Research Article	It is concluded that the introduction of television in the 1950s caused a subsequent doubling of the homicide rate, ie, long-term childhood exposure to television is a causal factor behind approximately one half of homicides committed in the United States, or approximately 10,000 homicides annually. . . . exposure to television is also a causal factor behind a major proportion – perhaps one half – of rapes, assaults, and other forms of interpersonal violence in the United States. (p. 3061)
Strasburger et al., 2014	Research Article	The perpetrator of the Naval Yard shooting, who killed 12 people in September 2013, spent up to 16 hours a day playing violent video games (e.g., “Call of Duty”). (p. 571)
Cook, 2000	Testimony to congress, following the Columbine Massacre	Epidemiologists studying a broad array of factors associated with violence, including poverty, racial discrimination, substance abuse, inadequate schools, joblessness and family dissolution, found that exposure to violent media was a factor in half of the 10,000 homicides committed in the United States the previous year.
Anderson, 2000	Testimony before the U.S. Senate Commerce Committee on the impact of interactive violence on children high exposure to media violence is a major contributing cause of the high rate of violence in modern U.S. society.
Boxer, 2013	Editorial, writing post Sandy Hook	There is no division in the scientific community about this. Despite a vocal minority of scholars, the consensus among scientists, pediatricians and organizations charged with promoting the science of human welfare . . . is that playing violent video games increases risk for violent behavior.
Bushman, 2013a	Op-ed, CNN	Controlling the use of violent video games is one step we can take to help protect our society from violence.

Table 1 Continued

Citation	Source	Quote
Strasbourg, 2007	Research Article	Overall, an estimated 10% to 30% of violence in society can be attributed to the impact of media violence. (p. e1398)
Bartholow & Anderson, 2002	Research Article	During recent years, violence among children and adolescents has received increased attention. In several places around the United States – from urban Detroit, to suburban Georgia and Colorado, to rural Kentucky – incidences of youth violence have claimed the lives of schoolchildren and their teachers. (opening sentence of an article examining the effects of violent media); p. 283)
American Academy of Pediatrics, 2009	Policy Statement	Although shootings in schools around the world periodically prompt politicians and the general public to focus their attention on the influence of media violence, the medical community has been concerned with this issue since the 1950s. The evidence is now clear and convincing: Media violence is one of the causal factors of real-life violence. . . Youth violence is a public health issue in the U.S., because it accounts for so many deaths. . . it is worth noting that in 2005, twelve to twenty year olds committed 28 percent of single-offender and 41 percent of the multiple-offender violent crimes in the U.S., despite comprising only thirteen percent of the population. (presented in discussion of an article examining the effects of violent media; p. e1071)
Anderson et al., 2008	Research Article	More than any other media, these video games encourage active participation in violence. From a psychological perspective, video games are excellent teaching tools because they reward players for engaging in certain types of behavior. Unfortunately, in many popular video games, the behavior is violence.
Bartholow, as cited in Jaccarino, 2013	Interview, <i>Fox News</i>	In April 2002, Germany was shocked by an unprecedented school shooting in which 17 people, including the assailant, were killed. It was soon established that the 19-year-old killer, a former pupil at the school who had been expelled some weeks prior to the attack, had not only been fascinated by firearms but had also spent much of his time playing violent electronic games. (p. 53)
Krahé & Möller, 2004	Research Article	

Table 1 *Continued*

Citation	Source	Quote
Romer, as cited by NPR, 2013	Interview, NPR (Boston)	... of course we led off the article with the example of James Holmes, who actually reenacted The Joker and went into a movie theater when they were showing "The Dark Knight," you know, to do what he did. And that's totally anecdotal, but, you know, we think that can be happening to a lot of kids who are - don't have parental guidance.
American Academy of Pediatrics, 2009	Policy Statement	Although shootings in schools around the world periodically prompt politicians and the general public to focus their attention on the influence of media violence, the medical community has been concerned with this issue since the 1950s. The evidence is now clear and convincing: Media violence is one of the causal factors of real-life violence... (p. 1495)
Bushman et al., 2015	Commentary in which the authors claim not to assert links between violent films and violent behavior	...films showing the use of guns to resolve conflicts could teach youth scripts that legitimize the use of weapons rather than more peaceful ways of handling problems. The most dramatic influence of those scripts occurs when perpetrators of mass shootings dress and act remarkably like violent characters in movies.
Bushman et al., 2015	Commentary in which the authors claim not to assert links between violent films and violent behavior	Indeed, a child of any age can gain entry to a PG-13 movie, whether accompanied by an adult or not. This trend is a serious concern among those who study media effects and those who regard our high rates of gun violence as a national problem.

getting lung cancer from secondhand smoke, or osteoporosis, contracting HIV, or getting cancer from asbestos, or getting brain damage from lead-based paint” (Bushman et al., 2015, p. 174). Such a claim seems to be in stark contrast to the statements made by scholars (see Table 2), in which violent media effects are presented as being analogous, or at the very least, comparable to these serious public health issues. If these researchers did not intend to suggest that violent media are similar to these health issues then we strongly suggest that they stop making such statements, as it is likely that other researchers and the general public will misinterpret the intent of these claims.

There are various reasons why draping research findings about media violence in the context of mass shootings and other violent crimes should be avoided. At best, this tactic confuses and distracts readers; at worst it exploits the tragedies and their victims. There is also the very real possibility that some scholars will start to believe these sensationalistic claims as true. For example, in a recent court case, one prominent violent media researcher, serving as a paid expert witness for the defense, argued that a 14-year-old victim of a horrific multiple murder may have actually been the perpetrator of the murder, in part because he liked to play the violent video game *Mortal Kombat* (Rushton, 2013). Although this testimony did not sway the jury and Assistant Attorney General Michael Atterberry later said it was “The most offensive testimony I’ve heard in my life” (Rushton, 2013), it serves as a stark reminder that researchers can sometimes get caught up in the sensationalistic tone of their own claims.

Perhaps more alarming is when politicians, the media, and laypersons grasp onto such statements and assume that researchers have actually found a link between violent media and horrific acts of violence (see Table 3 for examples). As scientists we need to be aware that the statements we make in our articles and in the media have a real impact on the beliefs of others. We need to be mindful that just because we might briefly discuss a study’s limitations or acknowledge the need for future research in an article or during a press interview does not eradicate the shortcomings of our research. In other words, we are ultimately responsible for not just pointing out the limitations in our research but constantly emphasizing these shortcomings when discussing our research to others. As scientists it is our job to educate the public about the findings of scientific research and not generalize beyond the data.

Linking violence in films to violence by youth

The commenters now claim that they do not intend to imply that “increases in depictions of gun violence in PG-13 movies would lead to aggregate increases in gun violence in the adult population.” (Bushman et al., 2015, p. 174). We find this claim somewhat suspect for several reasons. First, the authors made various links between gun use, films, and violent rampages among adults both in their research article and during media interviews (see Table 1 for examples). Second, almost all of the studies cited by the authors demonstrating the power of the “weapons effect” and violent media used adults as subjects. Finally, the lead commentator recently coauthored a

Table 2 Examples of Statements Made by Media Scholars Suggesting Violent Media Effects are Comparable to Serious Public Health Issues

Citation	Source	Quote
Bushman & Anderson, 2001	Research Article	There are at least six instructive parallels between the smoking and lung cancer relationship and the media violence and aggression relationship. (p. 481)
Bushman, as cited in Grabmeier, 2012	Press Release from Brad Bushman and The Ohio State University	Playing video games could be compared to smoking cigarettes. A single cigarette won't cause lung cancer, but smoking over weeks or months or years greatly increases the risk. In the same way, repeated exposure to violent video games may have a cumulative effect on aggression.
Bushman, 2013c	Testimony before the House Subcommittee on Commerce, Justice, Science and Related Agencies	We know that video game violence is correlated with violence – just like smoking is correlated with lung cancer.
Bushman, as cited in Walch, 2014	BYU Marjorie Pay Hinckley Lecture	We don't let our kids smoke cigarettes, drink beer or play with guns. Let's protect our children. Let's make sure they don't consume age-inappropriate media.
Hasan, Bègue, Scharkow, & Bushman, 2013	Research Article	Smoking provides a useful analogy for the importance of this work. Smoking one cigarette will probably not cause lung cancer, but repeatedly smoking cigarettes for days, weeks, months, and years, greatly increases the risk. Similarly, playing a violent video game once will probably not cause a person to become more aggressive, but repeatedly playing violent games for days, weeks, months, and years may increase the risk. (p. 224)
Bushman & Huesmann, 2001	Chapter	True, media violence is not likely to turn an otherwise fine child into a violent criminal. But, just as every cigarette one smokes increases a little bit the likelihood of a lung tumor someday, every violent show one watches increases, just a little bit the likelihood of behaving more aggressively in some situations (p. 248)

Table 2 *Continued*

Citation	Source	Quote
Strasburger, Jordan, & Donnerstein, 2010	Research Article	The impact of media violence on real-life aggressive behavior is stronger than many commonly accepted public health risks and nearly as strong as the link between smoking and lung cancer (p. 759)
Bushman & Anderson, 2001	Research Article	“. . . most people would not question the assertion that calcium intake increases bone mass or that wearing a condom decreases the risk of contracting HIV, the virus that causes AIDS. Why, then, do some people still question the assertion that viewing violence increases aggression? (p. 480)

large-scale meta-analysis in which it was concluded that, concerning the negative effects of violent media, “there is little evidence of larger effect sizes for younger than for older participants.” (Anderson et al., 2010, p. 170). Although it is unclear why the commenters now suggest that adults are not affected by violent films, this new belief is consistent with the findings from our study, which found that annual trends in violent films and gun violence in movies were unrelated to violent crime and homicides involving firearms in the United States. As we appear to be in agreement concerning this issue, we hope the commenters will cease discussing these findings in the context of adult murders and will emphasize that they do not think people over the age of 18 are adversely affected by such violent media.

The main evidence Bushman et al. (2015) now present in support of their hypothesis that youth are adversely affected by violent films is a simple figure (see Figure 1 in their response). We find it somewhat ironic, considering their discussion about the importance of examining such data with vector autoregression, that these authors themselves fail to conduct such an important analysis on these data. They also fail to employ other commonly utilized time series analyses, such as the ARIMA approach utilized in our study (a method recommended by various scholars, including Steven West [West & Hepworth, 1991] and Rebecca Warner [Warner, 1998]). In fact, the commenters conduct *no* statistical analysis nor do they control *any* potential confounding variables to support their claim. The commenters failed to report any statistical analyses, despite the fact that they were granted as much space as necessary for their response. This is particularly noteworthy considering the lead commenter’s expressed conviction that confounding variables need to be controlled in order to avoid misleading conclusions (Anderson, Bushman, & Groom, 1997).

Even beyond these concerns, the commenters’ speculations about “how gun violence depictions affect gun violence in the real world” is problematic given their

Table 3 Examples of Sensationalistic Statements Made by Politicians, the Media, and Laypersons

Citation	Source	Quote
Sen. L. Alexander, as cited in Linkins, 2013	Speaker, Senate Judiciary Committee	... video games is (sic) a bigger problem than guns, because video games affect people
J. Thompson, as cited in ABC News, 2000	<i>World News Now</i> , ABC	In every school shooting, we find that kids who pull the trigger are video gamers
Sen. J. Lieberman, as cited in CNN, 1997	News Conference, Washington, DC	This is sick stuff, and sadly it sells... Let there be no doubt: These games are not harmless fun, as some suggest, but digital poison.
H. Clinton, as cited in Vitka, 2005	Interview, <i>CBS News</i>	Playing violent video games is to an adolescent's violent behavior what smoking tobacco is to lung cancer.
Jaccarino, 2013	Headline, <i>Fox News</i>	<i>Training Simulation: Mass killers often share obsession with violent video games</i>
Bates & Pow, 2013	Headline, <i>Daily Mail</i>	Lanza's descent to madness and murder: Sandy Hook shooter notched up 83,000 online kills including 22,000 'head shots' using violent video games to train himself for his massacre
Lt. Col. Grossman, 2013	Op-ed, <i>Variety</i>	So, the brutal, merciless, savage mass murder of first-graders in Connecticut was another in a long line of avid videogame players who turned their sick fantasy into our tragic reality. Surprised? ... violent videogames are "murder simulators" that train kids to kill.
Palmeri, 2012	<i>New York Post</i>	Headline: <i>Killer's Basement His Eerie Lair of Violent Video Games.</i>
R. Nader, as cited in Kain, 2013	Speech, Former Green Party Presidential candidate	Adam Lanza spent hours playing violent video games, such as "Call of Duty," in the basement of the home where he shot mom Nancy before his rampage. ... they should protect their children family by family from these kinds of electronic child molesters (referring to violent television and video games).
Schlafly, 2010	Op-ed, <i>Eagle Forum</i>	Virtually every school massacre can be traced to the young killers' addiction to violent video games.
Gingrich, 1999	Speech, Former Speaker of the House	... let us say to the Nintendos and the other games – if you are going to be sick, we are going to find a way to protect this country from you.
Violence in Video Games Labeling Act; HR. 4204, 2012	Proposed video game warning label	WARNING: Excessive exposure to violent video games and other violent media has been linked to aggressive behavior.

selective reliance on inconsistent time periods, arbitrarily chosen measures, and questionable secondhand sources. For example, it is not true, as the commenters claim from a secondhand citation, that “the rate of fatalities attributable to gun use in black youth has continued to increase since 1963.” (Bushman et al., 2015, p. 174) On the contrary, the FBI (2014) and CDC (2014) both indicate that rates of gun mortality, gun homicide, and homicide arrest among African Americans under age 20 decreased by 62%, 63%, and 87%, respectively, from 1993 to 2012, reaching the lowest levels in 40–50 years for gun violence and the lowest rate ever reliably recorded for homicide arrest. Similar declines are evident among nonblack youth (“white” is amorphous, given the large increase in Hispanic youth classified as white). Furthermore, the increased ability to prevent death among gunshot victims over the last half-century is offset by the increased lethality of firearms and more complete reporting and classification of deaths.

The commenters largely eschew standard indexes (including FBI Uniform Crime, National Crime Victimization Survey, and Centers for Disease Control mortality reports) that consistently document large, post-1993 declines in violence involving youth and instead rely on lesser measures that might be construed as showing increased violence. They cite CDC nonfatal gun assault injury trends for ages 0–19 in the 2000s as evidence of the “increased ... use of guns by youth ... in recent years.” They fail to note FBI (2014) reports finding a large majority of those arrested for murdering persons under age 18 are adults, not peer youth, indicating that nonlethal gun assaults victimizing children and youth also would heavily involve older assailants. The commenters also fail to note that, while nonfatal gun assault rates rose among ages 0–19 (up 22% from 2001 to 2013, using the most recent CDC 2014 data) and ages 20–29 (up 29%), they rose even more among ages 30–39 (up 57%), 40–49 (up 108%), and 50 and older (up 66%). These “trends” may be artifacts of hospital sampling procedures used by CDC, but if valid, it is intriguing that trends among older ages are distinctly more alarming than among younger ages.

The commenters further cite the “rise in mass shootings in schools and other venues,” such as homes and businesses. These occurrences involve very few, unpredictable individuals, who are overwhelmingly adults. If anecdotal cases are to be cited, all ages and the full range of cultural influences should be examined, not just youth and popular media labeled as “violent.” For example, other alleged influences on homicidal individuals have included the Bible, the Koran, Shakespeare, bands such as the Beatles and U2, Anglican religious services, instructional dance videos, *Catcher in the Rye*, and talking animals.

To assess the movie violence issue comprehensively by age, we assembled annual CDC (2014) tabulations of all gun deaths from 1950 through 2012 in four categories (homicide, suicide, unintentional, and undetermined) and 13 standard age groups. Homicide arrests by age group were obtained from FBI (2014) tabulations adjusted to reflect national populations for 1960 through 2012. Additionally, nonfatal firearm assault injury rates for five age groups were tabulated for the full 2001–2013 period available.

Table 4 Uncontrolled Correlation of Gun Homicide, Homicide Arrest, and Movie Violence

		Gun Homicide Rate		Homicide Arrest Rate		Movie Violence Depiction
		10–14	15–19	10–14	15–19	
Gun homicide mortality rate, ages 15–19	<i>r</i>	.94*				
	<i>df</i>	51				
Homicide arrest rate, ages 10–14	<i>r</i>	.80*	.63*			
	<i>df</i>	51	51			
Homicide arrest rate, ages 15–19	<i>r</i>	.93*	.85*	.92*		
	<i>df</i>	51	51	51		
Movie violence depiction	<i>r</i>	.17	.36*	-.33*	-.15	
	<i>df</i>	51	51	51	51	
Movie gun violence depiction	<i>r</i>	-.24	-.08	-.28	-.24	.65*
	<i>df</i>	26	26	26	26	26

Note: Bolded values depict relations between homicide rates and movie violence.

**p* < .05.

Several socioeconomic variables, including poverty, education level, and GINI index were evaluated. Although poverty level and associated socioeconomic measures have proven reliable predictors of violence arrest and victimization levels across all age groups (Males & Brown, 2014), poverty trends per se are not reliable predictors of violence trends. Rather, the trend in the rate of poverty in youth relative to older age groups is the most accurate predictor of violence trends among young people. For the purposes of this analysis, the calculated independent variable, youth poverty ratio (the ratio of the poverty rate among persons under age 18 to the poverty rate for all ages), which stood at around 1.2 in 1960, 1.5 in the 1990s, and 1.4 today, most strongly correlates with violence trends among young ages. Simple uncontrolled correlations and partial correlations controlling for youth poverty ratio compared two outcomes, annual gun homicide mortality and homicide arrest rates, for two adolescent age groups (10–14, 15–19), with annual tabulations of movie violence and movie gun violence depictions as cited by Bushman et al. (2013) for the maximum time periods available.

The simple analysis in Table 4 shows that the six correlations of homicide arrest and gun homicide mortality rates for the two age groups are strongly associated over time, as are the two movie violence measures with each other. Of the correlations between the movie violence measures and the four teenage outcomes, two are significant: gun homicide for ages 15–19 (positive) and homicide arrest for ages 10–14 (negative). All four movie gun violence and teenage outcomes were nonsignificant and negative.

Table 5 presents the same correlations controlling for youth poverty ratio. Its inclusion renders all eight movie violence and movie gun violence depiction indexes

Table 5 Partial Correlation of Homicide Arrest, Gun Homicide, and Movie Violence Depiction controlling for Youth Poverty Ratio

		Gun Homicide Rate		Homicide Arrest Rate		Movie Violence depiction
		10–14	15–19	10–14	15–19	
Gun homicide mortality rate, ages 15–19	<i>r</i>	.88*				
	<i>df</i>	50				
Homicide arrest rate, ages 10–14	<i>r</i>	.87*	.66*			
	<i>df</i>	50	50			
Homicide arrest rate, ages 15–19	<i>r</i>	.94*	.84*	.93*		
	<i>df</i>	50	50	50		
Movie violence depiction	<i>r</i>	-.29*	-.01	-.47*	-.37*	
	<i>df</i>	50	50	50	50	
Movie gun violence depiction	<i>r</i>	-.24	-.02	-.32	-.23	.67*
	<i>df</i>	25	25	25	25	25

Note: Bolded values depict relations between homicide rates and movie violence controlling for youth poverty ratio.

* $p < .05$.

negative, three of which are significant (gun homicide for age 10–14, homicide arrest for both ages 10–14 and 15–19). That is, more violent movie/gun depictions accompanied less homicide arrest and gun homicide among teenagers. It appears that virtually all of the explained variance in teenage violence outcomes was accounted for by same-direction variance in the youth poverty ratio, and none by variations in movie violence depictions, which were nonsignificant and/or more often negative than positive.

Finally, to assess whether movie violence has a cumulating, lagged effect on real violence (i.e., whether previously viewed media violence would affect violence rates in teenage years), we cumulated movie violence and movie gun violence incidents by 10-year periods (1950–1959, 1951–1960, etc.) and correlated these cumulated totals with homicide rates and gun homicide rates for the last year in each period (1959, 1960, etc.). Replicating single-year analyses, both uncontrolled and controlled analyses of cumulated movie violence and movie gun violence measures were either nonsignificant or were significantly negatively correlated with gun homicide and homicide arrest rate trends for both ages 10–14 and 15–19.

The overriding question is why the post-1993 era, when violent movies (Bushman et al., 2013), music, television, video games, and Internet sites proliferated in an unprecedented fashion, did not feature a proliferation of real-world violence by gun-wielding young assailants? Instead, data suggest an unprecedented plunge in violence of all types among young people that far exceeded trends among older ages. Among teenagers, gun homicide mortality rates fell by over 60% and homicide arrest rates fell by 80% from their early 1990s peak through 2012.

Our analysis suggests the real trends should have been the expected ones. First, the falling youth poverty ratio after the mid-1990s predicted falling violence rates among youth. Second (and much less significantly), once the youth poverty ratio was controlled, increased movie violence was associated with no effect or decreased real-world violence among the young. Still, the extraordinary decline in violence and gun fatality among young people remains unexplained even by the best factors at hand. This provides additional reason to avoid speculative emphasis on emotionally appealing but factually dubious causalities.

The examination undertaken here and in the more comprehensive analysis originally published (Markey et al., 2015) finds no grounds for even a hypothesis that increased depiction of violence and guns in movies over time stimulates young people to real homicide and shootings. Any other random factor, such as the average length of movies, proves just as invalid a predictor when tested. In fact, analyses that include a socioeconomic measure indicate that more violence and gun violence in movies is associated (nonsignificantly in three cases, significantly in three others) with lower levels of gun homicide and homicide arrest among both younger and older teenagers.

Finding a middle ground

We are in agreement with the commenters that no study has found that gun violence in the popular media causes or is positively correlated with horrific acts of real violence. However, we disagree with how scientists should deal with this lack of data. The commenters argue that scientists should essentially *assume* a link exists, as they “see no reason to be complacent about the rise in gun violence in movies, especially those rated as acceptable for children 13 and older. . . . This trend is a serious concern among those who study media effects and those who regard our high rates of gun violence as a national problem” (Bushman et al., 2015, p. 174). We argue that researchers need to be more cautious in their research articles and media interviews and not emphasize a link between violent media and real-world violence that has yet to be found.

A minority of media scholars have been quick to label others who disagree with the conclusion that violent media causes real-world violence as “denialists” (Anderson, 2013, p. 18) and “industry apologists” (p. 19). At the extreme, these media scholars have likened dissenting researchers to those who work for the tobacco industry, deny the occurrence of global warming, believe the moon landing was a hoax, and even to those who deny the Holocaust (Bushman et al., 2015; Strasburger, Donnerstein, & Bushman, 2014).

However, such extreme statements are not endorsed by the majority of media scholars. As seen in Figure 1, contrary to the claims by Bushman (2013b) that an “overwhelming majority of social scientists working in the area now accept that media violence poses a danger to society,” a recent survey by Bushman himself found that only 35% of media researchers think there is enough evidence to conclude that violent media is an important cause of severe forms of violence, such as homicides, aggravated assaults, or school shootings (Bushman, Gollwitzer, & Cruz, 2014). However, 57% of

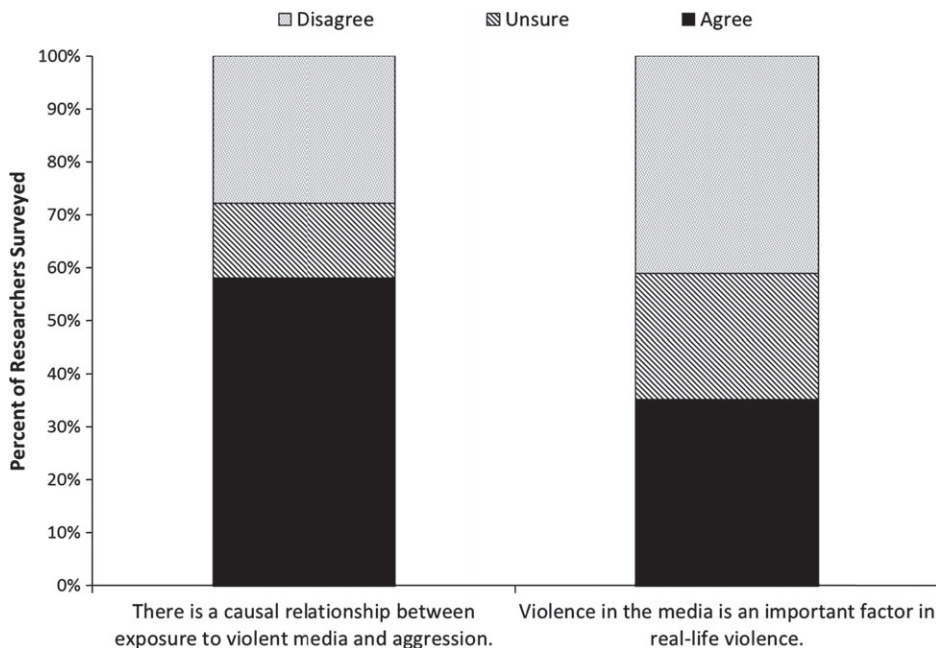


Figure 1 Media researchers' opinions about the potential negative effects of violent media. *Note:* Results from a survey of 379 media researchers reported in Bushman et al. (2014). Figure was adapted from descriptive data reported in Table 1 of Bushman et al., indicating the number of scientists who agreed, disagreed, or were unsure in their opinions about these questions.

researchers do believe that such media might encourage other types of less aggressive behaviors, such as bullying, spreading gossip, minor fights at school, pushing and shoving, or hurling insults.

In many ways, the opinions of most scholars seem very reasonable given the amount of available data. There may be some negative effects of violent media on minor forms of aggression, but there is not enough evidence to conclude that violent media has any impact on severe acts of violence. Further, the findings of this article suggest movie violence has no, or possibly a small salutary, effect on real violence in the post-1990 period once poverty trends are controlled. The researchers who maintain these positions are not in denial; rather they recognize that many laboratory findings measuring minor forms of aggression among college students cannot be generalized to violent crime.

We call on researchers to use caution and avoid sensationalizing beyond their data. Additionally, we hope both reviewers and editors exercise their control and encourage the removal of sensationalistic statements from otherwise reasonable studies. After all, every scientist who studies media effects wants pretty much the same thing. We want to uncover the "truth." We want science, not sensationalism, to inform education, intervention, and policy concerning violent media. We want to protect our children,

friends, and loved ones from any threats posed by violent media, but we do not want overstated claims about violent media to distract from the more important causes of real-world violence.

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