

## **Imitation and the Effects of Observing Media Violence on Behavior**

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### **Abstract**

On the surface, to anyone who studies imitation, it would seem that exposure to violence in the real world or the media world would have obvious potential for stimulating violent behavior in the viewer. In fact, as reviewed in this chapter, the empirical data are quite compelling that exposing children to media violence does increase their probability of behaving aggressively in the short run and, when exposure is lasting, throughout the life course. A review of the psychological processes underlying these effects suggests that while priming of already existing aggressive scripts may be a more important contributor to the short term effect, the acquisition of scripts, beliefs, and schemas about the world through imitation and inference is the most important contributor to the long term effect. It is suggested that a broader understanding by the public of the universality of imitation in humans and its neurophysiological basis may overcome the reluctance of many with political concerns about free speech issues or vested economic interests in media violence to accept the truth that media violence can increase the risk for violent behavior in the viewing audience.

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Anyone who attempts to make sense out of the 50 or more years of writings about the effects of media violence is faced with a daunting task. It is a topic on which much has been written with passion, on which much nonsense has been written, on which many outrageous claims have been made, on which otherwise intelligent people seem to fall victim to the worst kinds of wishful thinking, and yet on which an enormous body of scientific research has accumulated. In other essays in the volume some of the key issues and controversies surrounding the potential effects of media violence are outlined and discussed. However, it is important that such a delineation of key issues be coupled with a review of the actual scientific evidence that has been collected on the effects of media violence, the psychological processes that have been identified as causing its effects, and the exact role that imitation plays in the process. When this is done, it becomes apparent that the recent research and thinking on imitation reflected in the essays in this book increases one's confidence in the conclusion that media violence is stimulating violent behavior.

### **Processes Accounting for Effects of Media Violence**

To begin with one must realize that different processes explain *short term effects* and *long term effects*. Short term effects are due to 1) priming processes, 2) excitation processes, and 3) the immediate imitation of specific behaviors. (Bushman & Huesmann, 2001; Huesmann, 1988; 1998). Long term effects will be discussed shortly.

Briefly priming is the process through which spreading activation in the brain's neural network from the locus representing an external observed stimulus excites another brain node representing aggressive cognitions or behaviors (Berkowitz, 1993). These excited nodes then are more likely to influence behavior. The external stimulus can be inherently aggressive, e. g. the sight of a gun (Berkowitz & LePage, 1967), or something neutral like a radio that has simply been nearby when a violent act was observed (Josephson, 1987). A provocation that follows *priming* stimulus is more likely to stimulate aggression as a result of the priming. While this effect is short-lived, the primed script, schema, or belief may have been acquired long ago and may have been acquired in a completely different context.

To the extent that observed violence (real world or media) arouses the observer, aggressive behavior may also become more likely in the short run for two other possible reasons -- excitation transfer (Zillmann, 1979; 1983) and general arousal (Berkowitz, 1993; Geen & O'Neal, 1969). First, a subsequent provocation may be perceived as more severe than it is because the emotional response stimulated by the observed violence is miss-attributed as due to the provocation (Zillmann, 1979; 1983). Such, excitation transfer could account for a more intense aggressive response in the short run. Alternatively, the increased general arousal stimulated by the observed violence may simply reach such a peak that the ability of inhibiting mechanisms such as normative beliefs to restrain aggression is reduced (Berkowitz, 1993).

The third short term process is imitation of specific aggressive behaviors. As other essays in this book illustrate, in recent years the evidence has accumulated that human and primate young have an innate tendency to imitate whomever they observe (Butterworth, 1999; Meltzoff & Moore, 2000; Rizzolati et al., 1996; Wyrwicka, 1996). Aggressive behaviors are no different than other observable motor behavior in this regard. Thus, the hitting, grabbing, pushing behaviors that young children see around them or in the media are naturally tried out immediately afterwards. Observation of specific aggressive behaviors around them increases the likelihood of children behaving exactly that way (Bandura, 1977; Bandura, Ross, & Ross, 1963).

Given these short term effects, what process accounts for long term effects? Long term effects are also primarily a consequence of imitation, but of a more complex type of imitation denoted as observational learning of cognitions by Bandura (1986). In recent theorizing (Huesmann, 1998; Huesmann et al., 2003) long term relations have been ascribed foremost to the acquisition through *observational learning* of three social-cognitive structures: schemas about a hostile world, scripts for social problem solving that focus on aggression, and normative beliefs that aggression is acceptable (Bushman & Huesmann, 2001; Huesmann, 1988, 1998). World schemas affect the kinds of attributions one makes about others' intent -- are they hostile or benign, for example. Scripts are cognitive programs (usually represented as 'production systems' or "if-then statements") that represent a coordinated sequence of behaviors to be used in a particular situation. Normative beliefs are the rules for appropriate behavior against which scripts are evaluated prior to use. The theory is that the observation of specific aggressive behaviors not only stimulates imitation of

those behaviors in the short run but leads to the acquisition of more coordinated cognitive scripts, world schemas, and normative beliefs for social problem solving that emphasize aggression. As the child grows older, the social scripts acquired through observation of family, peers, community, and mass media become more complex, abstracted, and automatic in their invocation (Huesmann, 1988; 1998). Additionally, children's social cognitive schema about the world around them begin to be elaborated. In particular, extensive observation of violence around them biases children's world schemas toward attributing hostility to others' actions (Comstock & Paik, 1991; Gerbner, Moss, Morgan, & Signorielli et al., 1994). Such attributions in turn increase the likelihood of children behaving aggressively (Dodge, 1980; Dodge, Pettit, Bates, & Valente., 1995). As children mature further, normative beliefs about what social behaviors are appropriate become crystallized, and begin to act as filters to limit inappropriate social behaviors (Huesmann & Guerra, 1997). Children's own behaviors influence the normative beliefs that develop, but so do the children's observation of the behaviors of those around them including those observed in the mass media (Guerra, Huesmann, Tolan, Van Acker, & Eron, 1995; Huesmann, Guerra, Zelli, & Miller, 1992; Huesmann, 1999). In summary, social-cognitive observational-learning theory postulates long-term effects of exposure to violence through the influence of exposure on the development of aggressive problem solving scripts, hostile attributional biases, and normative beliefs approving of aggression.

However, the kind of imitation called observational learning of cognitions is not the only process that causes the long term effects of media violence. Long-term effects are also quite likely increased by the habituation process called "desensitization." Most humans seem to have an innate negative emotional response to observing blood, gore, and violence. Increased heart rates, perspiration, and self-reports of discomfort often accompany such exposure (Cline, Croft, & Courier, 1973; Moise-Titus, 1999). However, with repeated exposure to violence, this negative emotional response habituates, and the observer becomes "desensitized." One can then think about and plan proactive aggressive acts without experiencing negative affect. Consequently, proactive aggression becomes more likely. This habituation process is not an "imitation process," but it may exacerbate the effects of imitation by reducing emotion related inhibitions against behaving aggressively.

## **Integration of Empirical Research Relating Media Violence to Aggression**

Once these processes are understood, the wealth of empirical evidence implicating exposure to media violence as a cause of aggressive behavior does not seem so surprising. However, to understand how compelling the evidence really is, one needs to integrate the evidence from all the different empirical approaches that have been employed.

The methodologies used in studying the relation between media violence and aggression fall into three major classes: 1) experiments in which the researcher manipulates exposure to media violence, 2) correlational studies, or one-shot observational studies in which exposure to violence and concurrent aggressive behavior are measured with surveys or observations, and 3) longitudinal observational studies in which exposure and behavior are measured on the same sample repeatedly over long periods of time. It is critical to integrate the findings of all three bodies of research in reaching any conclusion.

Generally, experiments have demonstrated consistently that exposing children to violent behavior on film and TV increases the likelihood that they will behave aggressively immediately afterwards (see reviews by Bushman & Huesmann, 2001; Geen and Thomas, 1986; Paik & Comstock, 1994). The typical paradigm is that randomly selected children who are shown either a violent or non-violent short film are then observed as they play with each other or with objects such as Bo-Bo dolls. The consistent finding is that children who see the violent film clip behave more aggressively immediately afterwards. They behave more aggressively toward persons (Bjorkqvist, 1985; Josephson, 1987) and toward inanimate objects (Bandura, 1977). The effects occur for all children from pre-school to adolescence, for boys and girls, for black and white, and for normally aggressive or normally non-aggressive. The average size of the immediate effect produced is about equivalent to a .4 correlation (Paik & Comstock, 1994). In these well-controlled laboratory studies there can be no doubt that it is the children's observation of the violence that is causing the changes in behavior. As described above, the psychological mechanisms operating are priming, excitation transfer, and simple imitation.

The question then becomes whether these causal effects observed in the laboratory generalize to the real world. Do they have real significance in the world? Do they extend over time? Does real media violence cause real aggression in the real world not just in the short run but in the long run as well?

Empirical correlational studies of children and youth behaving and watching media in their natural environments have demonstrated that the answer to both these questions is "yes." The great majority of competently done one-shot survey studies have shown that children who watch more media violence day in and day out behave more aggressively day in and day out (Paik & Comstock, 1994). The correlations obtained usually are between .15 and .30. Such correlations are not large by the standards of variance explained, but they are moderate by the standards of children's personality measurement, and they can have real social significance (Rosenthal, 1986). In fact, as Rosenthal has pointed out a correlation of 0.3 with aggression translates into a change in the odds of aggression from 50/50 to 65/35 -- not a trivial change when one is dealing with life threatening behavior. Moreover, the relation is highly replicable even across researchers who disagree about the reasons (e.g., Huesmann, Lagerspetz, & Eron, 1984; Milavsky, Kessler, Stipp, & Rubens, 1982) and across countries (Huesmann & Eron, 1986).

While these one-shot field studies showing a correlation between media violence viewing and aggression suggest that the causal conclusions of the experimental studies may well generalize to the real world, longitudinal studies with *children* can test the plausibility of long-term predisposing effects more directly. In perhaps the first longitudinal study on this topic, initiated in 1960 on 856 youth in New York State, Eron, Huesmann, Lefkowitz, and Walder (1972) found that boys' early childhood viewing of violence on TV was statistically related to their aggressive and antisocial behavior ten years later (after graduating from high school), even controlling for initial aggressiveness, social class, education, and other relevant variables (Lefkowitz, Eron, Walder, & Huesmann, 1977). A 22 year follow-up of these same boys revealed that their early aggression predicted later criminality at age 30 and that early violence viewing also was independently but weakly related to their adult criminality (Huesmann, 1986, 1995).

A more representative longitudinal study was initiated by Huesmann and his colleagues in 1977 (Huesmann & Eron, 1986; Huesmann, Lagerspetz et al., 1984). This three-year longitudinal study of children in five countries also revealed that the television habits of children as young as first-graders also predicted subsequent childhood aggression, even controlling for initial level of aggression. In contrast to earlier longitudinal studies, this effect was obtained *for both boys and girls* even in countries without large amounts of violent programming such as Israel, Finland, and Poland (Huesmann & Eron, 1986). In most

countries the more aggressive children also watched more television, preferred more violent programs, identified more with aggressive characters, and perceived television violence as more like real life than did the less aggressive children. The combination of extensive exposure to violence coupled with identification with aggressive characters was a particularly potent predictor of subsequent aggression for many children. Still, there were differences among the countries. While the synchronous correlations were positive in all countries, the longitudinal effect of violence viewing on aggression was not significant for girls in Finland or for all children in Australia. In Israel, there were significant effects for children living in a city but not for children raised on a kibbutz.

However, perhaps the most notable effect in this study stems from the just published 15-year follow-up of the USA subjects (Huesmann et al., 2003). About 60% of these children were tracked down and reinterviewed when they were in their early 20s, 15-years later. The findings inditing media violence are impressive. First, these children's exposure to media violence between age 6 and age 9 correlates significantly with a composite of 11 different kinds of measures of their aggression taken 15 years later when they were 21 to 25 years old. The correlation is .21 ( $p < .01$ ) for males and .19 ( $p < .01$ ) for females. Furthermore, the correlation is significant even if only physical aggression is used as the criterion. However, perhaps the impact of these findings is best conveyed by the results shown in Table 1 below where children who were in the top 20% on violence viewing as children are compared with those who watched less. The high violence viewers were clearly more likely to engage in an whole variety of very serious aggressive acts including criminal acts, spouse abuse, and assault.

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Insert Table 1 about here  
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Taken together with the many experiments that have unambiguously shown causation, these results certainly add credence to the conclusion that childhood exposure to media violence has lasting effects on behavior through a high level process of imitation in which cognitions that control aggressive behavior are acquired. Moreover, with modern statistical techniques (structural modeling and multiple regression analysis) Huesmann et al. (2003) were able to show that these longitudinal relations could not be explained

by more aggressive people simply liking to watch violence in the media, or explained as an artifact of social class or intelligence, or explained as an artifact of poor parenting or parent preferences for media violence or explained by any of many other measured variables. None of these models fit the data, but models with exposure to media violence causing aggression do fit the data within statistically acceptable bounds of goodness of fit.

### **The Public Understanding of Media Violence and Imitation**

In conjunction with the theories described above, the results from these three kinds of research -- experiments showing unambiguous causation, one-shot surveys showing real aggression correlates with concurrent habitual exposure to violent media, and longitudinal studies showing that childhood exposure predicts increased adult aggression independent of childhood aggression -- have lead most objective scientists to conclude that exposure to media violence increases a child's risk for behaving aggressively in both the short run and long run. In fact, despite what some write, there is a clear consensus of opinion among scholars who actually do research on the topic that exposure to media violence causes aggression. Surveys have consistently shown that over 80% of those doing research on the topic have concluded from the evidence that media violence is causing aggression (Murray, 1984). Most major health professional groups have issued statements citing exposure to media violence as one cause of youth violence . Two Surgeon Generals of the United States (in 1972 and 2001) have warned the public that media violence is a risk factor for aggression. For example, in March 1972, then Surgeon General Jesse Steinfeld told congress,

“... it is clear to me that the causal relationship between [exposure to] televised violence and antisocial behavior is sufficient to warrant appropriate and immediate remedial action... ..

there comes a time when the data are sufficient to justify action. That time has come.

(Steinfeld, 1972).

So who are the vocal minority that deny there can be any effects? The best-known social scientists who deny there are any effects (e.g., Cumberbatch, Fowles, Freedman, Jenks) generally have never done any empirical research on the topic. However, they are glib and compelling writers, and their opinions cannot simply be dismissed. Furthermore, there is a large body of other intellectuals who deny that there



are any effects. They range from the President of the Motion Pictures Producers Association (Jack Valenti), to the President of the Interactive Digital Software Association (Doug Lowenstein); from movie directors (e.g. Rob Reiner) to comic book producers (e.g. Gerard Jones); from science writers (e.g., Richard Rhodes) to booksellers (e.g., Chris Finan, President American Booksellers Foundation) just to name a few.

Some of the reasons are clear why many otherwise intelligent people refuse to accept the researchers' consensus. None of us likes the concept that we could be affected simply by what we watch. Don't we have the free will to overcome such influences? Haven't we seen our own children watch violence and seemingly not be affected? And does not even the idea of bad effects suggest censorship which we all find intolerable? But in addition to these personal feelings that create biases, other important factors come into play with the research on media violence. Enormous amounts of money are being made off media violence and those whose profits are threatened by even the idea that media violence could be very bad for some people have spent the last 50 years trying to deny the scientific evidence. Statistical behavioral science research is easy for glib writers to pick apart. There are always studies showing no effects to focus upon. If one does not want to believe a truth about human behavior, one can always focus on exceptions. There are flaws in some of the research on media violence, and some people do overstate the results. No single study is ever perfect particularly in the social sciences, and those whose agendas require opposition turn up every flaw. And often studies are misinterpreted by those who want to misinterpret them. A few longitudinal studies have been promoted as producing results at odds with the thesis that media violence causes aggression, but closer inspection of most of these studies reveals that their results are not discrepant, but simply not strongly supportive of the thesis. (For a review, see Huesmann & Miller, 1994). For example, while NBC's longitudinal study of middle-childhood youth conducted in the 1970s (Milavsky et al., 1982) is usually reported as not finding significant longitudinal effects, 12 of the 15 critical coefficients for boys were positive and 10 of the 15 critical coefficients for girls were positive. Meta-analysis, which are the most statistically valid way to combine results, and which show average effect sizes of .2 for field studies (see Paik & Comstock, 1994) are usually ignored by the skeptics.

All of these explanations are important. However, I think the most important reason is something else. It is that the most people do not really understand the power of imitation in molding every aspect of

human behavior. They don't understand it as a process in the same way that they understand the role of poisons or carcinogens. In fact, as Bushman & Huesmann (2002) have shown the size of the effect that media violence has on aggressive behavior is comparable or greater than many other biological public health threats that are generally accepted as serious. In the Huesmann et al. (2003) study the size of the correlation between media violence viewing in childhood and later adult aggression was about .20. That is higher than the correlation between exposure to lead and IQ loss, between calcium intake and bone mass, between exposure to asbestos and laryngeal cancer, and exposure to passive smoking in the workplace and lung cancer. Yet, most in the public are far more ready to accept these others as public health threats. The public accepts tobacco as causing lung cancer in part because they can imagine the physiological process through which tobacco starts tumors in the lungs. I am suggesting that the public is less willing to accept media violence as a major public health threat ,as yet, because the public does not understand the neurophysiological basis of imitation and the powerful role it plays in forming the adult self out of a child's experiences. Hopefully, as this book and others like it advance the knowledge about the important role that imitation plays, the public will become more accepting of the fact that long-term habitual violent behavior can be learned from observing others behaving violently in the media world as well as from observing others behaving violently in the real world.

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Table 1

Differences in Frequency(%) of Spouse Abuse, Serious Physical Aggression, and Illegal Behaviors "At Least Once" in Past 12 Months for High Childhood Violence Viewers Compared to Other Children (from Huesmann, Moise, Podolski & Eron, 2003)

ITEM	MALES			FEMALES		
	Hi viol viewers	Other viewers	Chi-sq. sig.	Hi viol viewers	Other viewers	Chi-sq. Sig.
Spouse abuse:						
Pushed, grabbed or shoved your spouse	41.7%	22.2%	$p < .05$	34.6%	21.2%	n. s.
Thrown something at your spouse	20.8%	14.8%	n. s.	38.5%	16.5%	$p < .02$
Serious physical aggression:						
Respond by shoving the person	68.8%	50.4%	$p < .05$	68.6%	43.2%	$p < .01$
Punch, beat, or choke another adult	21.9%	16.9%	n. s.	17.1%	3.6%	$p < .01$
Criminal behavior:						
Self-reported any crime in last year	62.5%	53.4%	n. s.	48.6%	25.9%	$p < .01$
State reported convictions	10.7%	3.1%	$p < .03$	00.0%	00.0%	n. s.
Driving behavior:						
Self-reported moving traffic violations	87.5%	76.3%	n. s.	80.0%	57.6%	$p < .01$
State-reported moving traffic violations	60.0%	39.4%	$p < .01$	28.9%	28.4%	n. s.