

CHAPTER 7

LONG-TERM EFFECTS OF
REPEATED EXPOSURE TO
MEDIA VIOLENCE IN
CHILDHOOD

L. ROWELL HUESMANN AND LAURIE S. MILLER

INTRODUCTION

About a quarter of a century ago, a young American radical, Stokely Carmichael, commented that violence was as American as apple pie! At least in terms of prevalence, nothing much seems to have changed since that time. The frequency of violence directed by one human being at another was appallingly high then and is appallingly high now. The United States is not the most violent society in the world. That distinction belongs to some of the less developed countries ravaged by wars, terrorism, drug battles, and general lawlessness. Nor is violence as endemic now as it has been during many of the last 20 centuries. Among

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the highly developed Western societies, however, the United States has scored at the top for the past several decades on most objective measures of interpersonal violence. For example, homicides in the United States rose from an overall rate of about 5 per 100,000 to 10 per 100,000 between World War II and the 1980s and have remained at about that level. Of course, the rate in some inner-city ghettos may be 10 times this rate (100/100,000) and the rate for certain age cohorts may be 3 times this rate (e.g., 30/100,000 for males 18 to 24). In comparison, no other highly developed Western society has a rate much above 3 per 100,000 and most are below 1 per 100,000. Rates at these levels are cause enough for concern and also reflect increases since World War II, but the sustained rates in the United States are a national tragedy. In some urban areas of the United States the most common cause of death for young males is now homicide.

The dramatic increase in interpersonal violence in the past century has occurred at the same time as other dramatic changes in life-styles produced by the great technological revolutions of the 20th century. Among the most notable of these for child development has been the introduction of the mass visual media into children's everyday life. When two highly salient events cooccur, it is common to hypothesize a causal relation between them; so it is not surprising that speculation about the role of media violence in stimulating violent behavior has been prevalent ever since motion pictures depicting violent acts first were distributed. With the advent of television in the early 1950s the speculation advanced to the point of theorizing, and the first studies were initiated. Since then, the question of whether media violence somehow promotes violence in society has been a constant, major topic of concern to communication researchers, psychologists, and policymakers. As a result, a large body of scientific literature on the topic has emerged.

The scientific studies fall into three major categories. First, there are the experimental studies in which exposure of children to scenes of violence is manipulated and the short-term changes in the children's behavior are evaluated. These experiments have been linked together under the rubric of "laboratory research" whether or not they have been executed in a laboratory or classroom. These studies have clearly shown that exposing children to visual portrayals of dramatic violence causes at least some of the children to behave more aggressively immediately afterwards. Second, there have been static observational field studies in which aggressive behavior and exposure to media violence are assessed in samples of children in their home and school environments. These studies have demonstrated that children who behave more aggressively on the average watch and prefer to watch more violent TV shows and

movies. Finally, there are the longitudinal field studies in which children's exposure to media violence and their actual aggressive behavior are assessed at two or more points in their lives. These are the kind of studies that our research group has focused on over the past 30 years. In many respects they are now the most crucial studies because they allow researchers to assess most directly the practical significance of the established relation between media violence and aggression.

On the basis of these empirical studies one can probably dismiss the notion that the current level of interpersonal violence in the United States and other Western nations is solely due to or even primarily due to the long-term exposure of our youth to scenes of violence in the dramatic media. Indeed, few serious students of aggressive behavior would have ever suggested such an hypothesis. More to the point, the existing empirical studies do provide support for the conjecture that the current level of interpersonal violence in our societies has been *boosted* by the long-term effects of many persons' childhood exposure to a steady diet of dramatic media violence. This thesis is supported most directly with a review and analysis of longitudinal studies of real children growing up to be real adults. Since one cannot analyze those studies in a theoretical vacuum, we must begin with a review of the relevant psychological theory and also attend to the more traditional laboratory experiments that have been used to test aspects of this theory. Only then can we turn to a review of the relevant longitudinal studies.

AGGRESSIVE BEHAVIOR

Let us begin, however, with a definition of aggressive and violent behavior. Some harmful events are violent without being manifestations of aggressive behavior; for example, automobile accidents. We are not interested in that kind of violent event in this chapter. We are interested in behaviors by one individual that are intended to injure or irritate another individual. Such behaviors are called aggressive behaviors (Eron, Walder, & Lefkowitz, 1971). Excluded from this class of behaviors are assertive actions that are commonly called "aggressive" (e.g., aggressive salespeople or executives).

MULTIPLE CAUSES AND EARLY ONSET

Two of the clearest conclusions one can draw about human aggressive behavior from the existing research is that severe aggressive acts are

most often the product of multiple causes and that characteristically aggressive people first display their abnormal behavior at a very early age.

Individual differences in social behavior related to aggression (e.g., early temperament) are apparent before age 2 (Kagan, 1988). By age 6, a number of children have adopted aggressive patterns of behavior in their interactions with others (Parke & Slaby, 1983). From that point on the extent of aggressive behavior in children tends to increase into adolescence. By age 8, children are characteristically more or less aggressive over a variety of situations; and aggression becomes a relatively stable characteristic of the individual youngster that predicts adult aggression (Ensminger, Kellam, & Rubin, 1983; Farrington, 1982, 1990; Huesmann, Eron, Lefkowitz, & Walder, 1984; Loeber & Dishion, 1983; Magnusson, Duner, & Zetterblom, 1975; Moffitt, 1990; Olweus, 1979; Robins & Ratcliff, 1980; Spivack, 1983). The more aggressive child becomes the more aggressive adult.

The existing research also suggests that childhood aggression is most often a product of a number of interacting factors: genetic, perinatal, physiological, familial, and learning. In fact, it seems most likely that severe antisocial aggressive behavior occurs only when there is a convergence of many of these factors.

The evidence for a heritable predisposition to aggression has accumulated in recent years. Adoption studies in Scandinavia, where subjects are easily tracked over several decades, show more concordance between adults' antisocial and aggressive behavior and their natural parents' behaviors than with their adoptive parents' behaviors (Cloninger & Gottesman, 1987; Mednick, Gabrielli, & Hutchings, 1984). In fact, both twin and adoption studies now provide compelling evidence that many personality characteristics tied to social behavior are influenced by heredity (Bouchard, 1984; Loehlin, Willerman, & Horn, 1985; Rowe, 1987; Rushton, Fulker, Neale, Nias, & Eysenck, 1986). While the methodologies of many studies in this area are necessarily complex and open to criticism, the evidence that there is a substantial heritable predisposition to aggression now seems compelling. That does not mean, of course, that situational and environmental variables are unimportant. On the basis of extrapolations from the animal literature, it seems quite probable that a heritable predisposition to aggression manifests itself in characteristic early social interactions. The animal literature also suggests that early interactions of an appropriate type can greatly mitigate the genetic predisposition to aggression. Lagerspetz and Lagerspetz (1971), for example, have shown that selective breeding for aggression can produce highly aggressive strains of mice in just a few generations. But the extent to which even mice from the most aggressive strain (after

30 generations) will evidence aggression as adults depends on their early social interactions with other mice (Lagerspetz & Sandnabba, 1982). Mice who are predisposed to be aggressive but who are raised in an environment in which "prosocial" behavior is rewarded, do not evidence such strong aggressive tendencies. Genetic predispositions interact with an organism's early learning experiences.

It also seems likely that the effects of specific chronic neurophysiological deficits that promote aggression, and the effects of neurotoxins (such as lead) and central nervous system (CNS) trauma (such as blows to the head) interact with the early environment to affect childhood and ultimately adult aggressive behavior. The evidence for the involvement of neurophysiological abnormalities in some cases of severe aggression is strong (Lewis, Moy, Jackson, Aaronson, Restifo, Serra, & Simos, 1985; Moyer, 1976; Nachson & Denno, 1987; Pontius, 1984). Less extreme individual differences in aggression sometimes seem to be related to naturally occurring variations in hormones such as testosterone, estrogen, and progesterone (Dalton, 1977; Olweus, Mattsson, Schalling, & Low, 1988). Individual differences in characteristic heart rates have also been linked to individual differences in adolescent aggression (Raine & Jones, 1987) and also to the differences in early childhood temperament that are related to aggression.

It has also been demonstrated that the effects on aggressive behavior of individual differences in neurophysiology are exacerbated and mitigated by both a child's early learning experiences and situational factors in the person's environment. For example, Olweus' (Olweus, Mattsson, Schalling, & Low, 1988) data suggest that a high testosterone adolescent would only be prone to behave aggressively in situations in which he was strongly provoked. In many cases of extreme aggressive reactions linked to neurophysiological deficits, the responses have been triggered by situational factors producing stress or early experiences that promoted aggression.

More generally, the existing research suggests that habitual aggressive behavior in young humans is to a great extent learned from the child's early interactions with the environment (Bandura, 1973; Berkowitz, 1974; Eron, Walder, & Lefkowitz, 1971; Huesmann, Eron, Lefkowitz, & Walder, 1984). While genetic and physiological factors may predispose a child toward aggression, it is the child's early learning experience that molds him or her into one who behaves more or less aggressively.

What are the key elements of the child's environment that promote the development of aggressive behavior? One must distinguish between instigators that motivate or cue aggressive responses and indirectly affect learning, and those components of the child's environment that

more directly mold the child's responses to these stimuli and socialize the child. An environment rich with environmental deprivations, frustrations, and provocations is one in which habitual aggression readily develops as the high level of aggression in our urban ghettos attests. The elements that are more important theoretically in socializing the child and in determining individual differences in learned responses, however, are the child's family, peers, and cultural surroundings, including exposure to television and movies.

THE SOCIALIZATION PROCESS FOR CHILDREN

As part of the socialization process, children are expected to adopt society's rules, attitudes, values, and norms. Throughout development, children are directed to think and behave in ways that are consistent with cultural standards. These standards are viewed as the essential regulators that lead children to develop patterns of behaviors and ways of interacting with others (Damon, 1983).

The socialization process requires children to learn to inhibit antisocial behavior and to display acceptable behavior. The process involves helping children to regulate and control their own behavior and to choose behavior that is appropriate to the situation.

Parents are traditionally thought of as the primary agents of socialization early in children's lives. Appropriate behavior is taught by parents' encouragement of acceptable behavior and discouragement of behavior that is unacceptable. Additionally, parents teach their children through direct tuition and modeling of appropriate behaviors. Although parents can have great influence over their children, their standards for behavior are not simply accepted and adopted because children are not passive recipients of social information (Bell & Harper, 1977). Children are active agents in creating the social experiences that influence their development. They participate in determining the nature of their social relations, bringing their own individual characteristics to the interactions in which they engage. Therefore, the process of interaction between the child and others in the child's social environment has bidirectional effects, changing both the child and those with whom the child interacts.

Although parents usually serve as the main socializing agents for young children, early in a child's development other sources of information can influence the socialization process. For example, peers become increasingly important in influencing a child's social development, as do the media (e.g., television, movies, videogames) and other adults (i.e., teachers and extended family members).

Because of the malleability of behavior in young children and the relative intractability of aggressive and violent dispositions once they have developed, it is important that theories concerning the influence of media violence on habitual aggressive behavior focus on exposure to media violence and aggression and antisocial behavior in preadolescent children. As we have argued above, individual differences during this period are influenced, of course, by factors with earlier loci of effect, such as genetics; but the major issue of interest is how, during early childhood, individual differences in the propensity for aggressive behavior develop as a consequence of the child's interaction with his or her environment. What are the dimensions and parameters of the socialization processes that lead to these individual differences? Through what psychological process does the influence of this early socialization process extend into adulthood? These are key issues for an understanding of the long-term effects of exposure to media violence.

COGNITIVE PROCESSES AND THE LEARNING OF AGGRESSION

Bandura (1977, 1986) has perhaps had the greatest influence on researchers' theorizing about how media violence influences social behavior. According to Bandura's cognitive/social learning theory, one way that the different sources (i.e., parents, peers, television, teachers) influence children is by serving as models for behavior (Bandura, 1977). The modeling process proposed by Bandura is based on research in cognitive psychology and hypothesizes a complex interaction of *cognitive* subprocesses that determine whether or not, and to what degree modeling takes place. In order for a modeled event to be performed, it must proceed through the four subprocesses of attention, retention, reproduction, and motivation (Bandura, 1977). According to Bandura, children do not learn patterns of interacting by copying specific behaviors. In fact, children older than 2 years of age are unlikely to learn behaviors from "pure" imitation. Instead, as they develop, children observe many behaviors from a variety of sources. According to Bandura's more recent formulations (Bandura, 1986), children not only adopt specific behaviors modeled by others but they also tend to adopt evaluative standards employed by these models. Bandura argues that these standards can be established by direct tuition, by other's reactions to one's behavior, and by observing the self-evaluative standards modeled by others. Therefore, beyond modeling specific behaviors, a child may pattern his or her thoughts, feelings, and actions after another person who serves as a model (Bandura, 1986). It is assumed that a child who consistently exhibits certain behaviors may have generalized

beliefs that represent adopted standards of conduct or values that support the use of these behaviors (Bandura, 1986; Huesmann & Eron, 1984). In other words, a child's social behavior is controlled to a great extent by these standards for behavior which may be learned from a variety of sources.

The cognitive structures that guide the child's behavior, are a central component in Bandura's formulation of the socialization process. In recent years, a number of other theorists, drawing both on Bandura's social learning theory and research in cognitive psychology, have offered theories that implicate the child's cognitions in the learning and maintenance of aggressive habits. These models put the stress primarily on cognitive processes and the steps through which a child must proceed in order to react appropriately, competently, and nonaggressively to a social situation or stimulus. Among the most influential of these have been the revised formulation from Bandura himself (1986), the neoassociationist perspective of Berkowitz (1984, 1988), and the information processing theory put forth by Huesmann (1982, 1988; Huesmann & Eron, 1984).

According to Bandura's (1986) recent formulation, social behavior comes under the control of internal self-regulating processes. What is important is the cognitive evaluation of events taking place in the child's environment, how the child interprets these events, and how competent he/she feels in responding in different ways. These cognitions provide a basis for stability of behavior tendencies across a variety of situations. Internalized standards are developed from information conveyed by a variety of sources of social influence. Children are exposed to many opportunities in which they may observe the self-evaluative standards of others, one of which is through the media. As Bandura asserts, in many aspects of living, televised vicarious influence has supplanted the primacy of direct experience. "Whether it be through patterns, values, attitudes, or styles of behavior, life increasingly models the media" (1989, p. 89). Berkowitz, on the other hand, has emphasized the importance of enduring associations in explaining stable behavioral tendencies. Aggression is an aversively stimulated behavior. An aversive event produces negative affect which is associated in most people with "expressive-motor reactions, feelings, thoughts, and memories that are associated with both flight and fight tendencies. . ." (Berkowitz, 1988, p. 8). A variety of factors—genetic, learned, and situational—affects the strengths of the flight and fight tendencies. The stronger tendency wins out, and, if it is fight, the emotional experience is interpreted as anger. Attributions about the behavior may occur later as a "controlled" cognitive process, but the generation of the behavior and the associated anger

is relatively "automatic."¹ Huesmann (1988; Huesmann & Eron, 1984) has viewed the child as a processor of information who develops programs called "scripts" to guide social behavior. Once scripts are firmly established they may be automatically executed, and the child's responses may seem to be "unthinking" even though they are the product of a complex set of cognitive processes. The more aggressive child, according to Huesmann (1988), is one who learns, retains, retrieves, and utilizes more aggressive scripts.

All of these approaches have the common theme that the child's cognitions play a key role in maintaining the stability of aggressive behavior over time and situation subject to the moderating or exacerbating influence of other predisposing factors. In the remainder of this review we will focus on Huesmann's script theory as the framework for understanding the long-term effects of media violence as revealed in longitudinal studies. It should be noted, however, that many of the same predictions would obtain from Bandura's or Berkowitz's theories.

SCRIPT THEORY AND LEARNING FROM MEDIA VIOLENCE

Of all these cognitive approaches, the information processing script theory developed by Huesmann (1988) is most directly intended to explain the stability of aggressive tendencies over time and the role of media violence in promoting aggressive behavior. Huesmann's theory adopts the premise that social behavior is controlled to a great extent by programs for behavior that are established during a person's early development. These programs can be described as cognitive scripts (Abelson, 1981) that are stored in a person's memory and are used as guides for behavior and social problem solving. A script suggests what events are to happen in the environment, how the person should behave in response to these events, and what the likely outcome of those behaviors would be. It is presumed that while scripts are first being established they influence the child's behavior through "controlled" mental processes (Schneider & Shriffrin, 1977; see footnote 1), but these processes become "automatic" as the child matures. Correspondingly, scripts that persist in a child's repertoire, as they are rehearsed, enacted,

¹ The terms *controlled* and *automatic* are technical terms developed by cognitive psychologists to describe different modes of mental processing (Schneider & Shriffrin, 1977). Automatic processes are mental processes that operate very rapidly with a person having little awareness of the mental operations involved (e.g., reading). Controlled processes operate much more slowly, and a person is much more aware that they are "controlling" the mental operations (e.g., mental arithmetic).

and generate consequences, become increasingly more resistant to modification.

According to Huesmann, the process through which scripts are formed is a learning process involving both *observational and enactive* components. The primary learning process is one in which the child observes sequences of behavior by others and encodes these sequences into a cognitive script. This is observational learning. The secondary learning process occurs when the child utilizes this script to guide his or her own behavior and is reinforced (positively or negatively) for the resulting response. This is enactive learning. Both learning processes may alter the structure of a script, affect the strength with which it is encoded, and its connections to other elements in the child's cognitive schema. Cognitive rehearsal of a script will also strengthen its encoding and connectedness. Furthermore, through a process of cognitive abstraction, subsets of learned scripts may be converted into more general scripts that provide overall guiding principles for social behavior. Thus, the scripts that guide the child into "childish" aggressive behavior form the basis for a set of more general scripts guiding the adult into adult "aggressive" behavior.

It is clear that, according to this theory, the child's observation of dramatic or real violence in childhood could contribute to the construction of lasting cognitive structures that would affect the child's behavior in childhood and when he or she was grown. The theory suggests, however, that the role for adult exposure to media violence in the learning of aggressive behavior is limited. Scripts for social behavior may still be learned during adulthood, but we adopt the developmental perspective that scripts learned early are the most influential. In practical terms this means that the theory predicts little relation between adult aggression and an adult's exposure to media violence but a significant relation between childhood exposure and childhood aggression. Furthermore, childhood exposure to media violence should be related to adult aggression to the extent that childhood aggression is related to adult aggression.

EXPERIMENTAL STUDIES OF TV VIOLENCE AND AGGRESSION

While the focus of this chapter is on longitudinal field studies of media violence and aggression, one cannot properly interpret such studies without placing them in the context of the true experiments and static field studies that have been conducted on this topic. Causal hypotheses

can never be tested as well in field settings as in true experiments. Since the reality of a child's life can never be captured very well in a laboratory setting, it is important to examine each in the context of the other.

In contrived experimental settings, children exposed to violent behavior on film or TV usually behave more aggressively immediately afterwards. Large numbers of laboratory and field experiments have demonstrated this fact over the past quarter-century (see reviews by Comstock, 1980; Geen, 1983, 1990; Geen & Thomas, 1986). Such results obtain both for aggression directed at inanimate objects (e.g., "Bobo" dolls) and for aggression directed at peers (Bjorkqvist, 1985; Josephson, 1987). For example, Josephson found that for boys the combination of having viewed a recent violent film and then being exposed to a distinctive cue that had been present in the film was particularly potent in stimulating aggression toward their peers in a natural setting. The role of distinctive cues in theories of how aggression is stimulated by media violence have been studied by Berkowitz (1983) and Huesmann (1986). The effects of violent TV or films on the affective responses that mediate aggression have also been clearly demonstrated with valid experiments. For example, Bushman and Geen (1990) demonstrated that violent videotapes elicit both aggressive cognitions and higher systolic blood pressure in college students. It is also true that in the laboratory, children can be taught to be less aggressive by showing them films with prosocial models (Eron & Huesmann, 1986; Pitkannen-Pulkkinen, 1979). These short-term effects are not limited to children but have been observed in teenagers and adults, particularly when the dependent measures reflect attitudes or opinions rather than behaviors (Malamuth & Donnerstein, 1982). In these well-controlled laboratory studies there can be no doubt that it is the children's observation of the scenes of violence that is *causing* the changes in behavior. Some critics would dismiss these studies completely as "artificial" approximations to life (Freedman, 1984) and focus only on field studies. But such a position is not defensible in light of the complementary nature of experimental and nonexperimental research in this area (Huesmann, Eron, Berkowitz, & Chaffee, 1991).

STATIC OBSERVATIONAL STUDIES OF TV VIOLENCE AND AGGRESSION

The demonstration of a relation between the observation of media violence and the commission of aggressive behavior has not been limited to the laboratory. Evidence from field studies over the past 20 years has led most reviewers to conclude that a child's current aggressiveness

and the amount of TV and film violence the child is regularly watching are positively related to some degree. More aggressive children watch more violent television. (Andison, 1977; Bachrach, 1986; Belson, 1978; Chaffee, 1972; Comstock, 1980; Eron, 1963; Eysenck & Nias, 1978; Hearold, 1979; Eron, Huesmann, Lefkowitz, & Walder, 1972; Huesmann, Eron, Lefkowitz, & Walder, 1973; Huesmann, 1982; Huesmann & Eron, 1986; Huesmann, Lagerspetz, & Eron, 1984; Lefkowitz, Eron, Walder, & Huesmann, 1977; Leyens, Parke, Camino, & Berkowitz, 1975; Loye, Gorney, & Steele, 1977; Milavsky, Kessler, Stipp, & Rubens, 1982; Parke, Berkowitz, Leyens, West, & Sebastian, 1977; Singer & Singer, 1981; Stein & Friedrich, 1972; Williams, 1978). This relation is not strong by the standards used in the measurement of intellectual abilities, and varies as a function of environmental, familial, cognitive, and TV programming variables. The relation is usually statistically significant, however, and substantial by the standards of personality measurement with children. Correlations of the magnitude usually obtained in the field can have real social significance (Rosenthal, 1986). 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). In contrast, significant correlations between aggression and adults' concurrent violence viewing have been observed only rarely in the field.

LONGITUDINAL OBSERVATIONAL STUDIES OF TV VIOLENCE

Let us summarize the most relevant points we have made so far. Existing longitudinal studies of aggression have established with some clarity that childhood aggression is predictive of adult aggression and antisocial behavior. Existing static field studies of media violence have established that exposure to media violence and childhood aggression are correlated. Existing true experiments done in the laboratory and field have established that exposure to dramatic scenes of violence on TV can cause a child to behave more aggressively immediately afterwards. The question that remains, then, is whether childhood exposure to media violence relates to aggression in later life. Yet, this is a critical issue for the media violence-aggression research. Most of that research has associated childhood aggression with childhood exposure to violence. Such childhood aggression is predictive of adult criminality. Therefore, if exposure to media violence is an important precursor of aggressive behavior, children's TV habits should be expected to be predictive of adult

antisocial behavior as well. Furthermore, just as not all children who are exposed to media violence display childhood aggression, it is likely that not all children who may learn to be more aggressive from viewing violence will behave more aggressively as adults. A variety of environmental, cultural, familial, and cognitive differences might exacerbate or mitigate the lasting effect of exposure to violence. These factors need to be identified. In the remainder of this chapter we discuss several longitudinal field studies that address this issue.

One cannot challenge the validity of the conclusion that exposure to media violence caused children to behave more aggressively in the true experiments described above. The experimental methodology assures the validity of the conclusion. Nor can one challenge the conclusion from the static field studies that more aggressive children watch and prefer more TV violence. Again the conclusion is appropriate for the methodology employed and the results uncovered. Taken together, these results also clearly suggest that media violence would play a causal role in stimulating real life aggression. It is impossible, however, to conclusively tease apart cause and effect with certainty in even the best longitudinal observational studies. Without the control that true experiments provide, causal conclusions are very risky. Nevertheless, appropriate multivariate analyses of data from longitudinal observational studies can suggest whether a causal effect is plausible.

The thesis of this chapter is that the available longitudinal data on the whole suggest that a causal effect is likely, particularly in the context of the cognitive-developmental theory of aggression outlined above. Specifically, the most plausible hypothesis is that habitual exposure to violent television programs teaches children aggressive habits which are maintained well into adulthood. More specifically, as described above, we hypothesize that the observed relation between exposure to media violence and aggressive behavior later in life by the viewer is the product of multiple psychological processes operating simultaneously, but that the key process involves a cycle of observational and enactive learning. Children may imitate specific violent behaviors they see on TV. But, more importantly, they store in their memories general "scripts" for aggressive behavior abstracted from whole sets of violent scenes. To repeat, by "script" we mean a cognitive representation of a program for behavior. Scripts can neither be observed nor directly measured, but they serve as useful hypothetical constructs for explaining behavior. We believe that social behavior is controlled to a great extent by such scripts which are usually learned quite early in life. Once learned, they are resistant to change, providing a mechanism through which early exposure to scenes of media violence can influence later behavior. Scripts

may be triggered into action by the occurrence of a particular type of social problem or by the presence of a cue associated with the script. Thus, once aggressive scripts have been incorporated into a child's repertoire, new scenes of violence, either in the media or in the environment, may trigger the use of a previously learned aggressive script as well as providing material for new scripts. To the extent that the scripts are rehearsed and utilized to guide behavior, the scripts become more firmly entrenched.

The relation between media violence and aggression quite probably involves other cognitive processes as well. Violent scenes may change children's attitudes about violence, and may change children's emotional responsiveness to violence (Malamuth & Briere, 1986; Rule & Ferguson, 1986). Numerous intervening environmental, cognitive, and programming variables seem to affect these processes (Huesmann et al., 1984), and aggression itself may stimulate violence viewing through its effect on the child's social environment and cognitions. More aggressive children, ostracized by their peers, may find justification for their behavior in the scenes of violence that characterize the media's representation of life. Thus, the susceptible child may become enmeshed in a continuous cycle of violence viewing and aggression—a cycle which leads to the development of habitual aggressive behavior.

One argument sometimes leveled against the research linking television violence viewing by children to increased aggressiveness is that "real" aggression was not measured. Boisterousness, hyperactivity, and even some "nastiness" may be related to violence viewing, but these are not the same as the antisocial aggressiveness of youths and adults that concerns society. Certainly, no one would argue that a fight among children can be equated with a fight among adults. As described above, however, there are now numerous longitudinal studies showing that these "childish" types of aggressive behaviors are the precursors of the more serious antisocial aggressive behaviors of adults. For example, Huesmann et al. (1984) have reported that peer-nominated aggressiveness in school at age 8 was predictive of adult criminality 22 years later. These data suggest that one should be greatly concerned with any process that promotes the establishment of aggressive habits in children as these habits may persist in altered forms into adulthood.

THE 10- AND 22-YEAR NEW YORK STATE STUDIES

Perhaps the first longitudinal field study to examine the long-term effects of TV violence on aggression was the Eron, Huesmann, Lefkowitz, and Walder (1972), Lefkowitz, Eron, Walder, and Huesmann (1977)

22-year study of youth in Columbia County, New York. This study, when begun in 1960, was intended primarily to assess the prevalence of aggression in the general population. The original focus was on aggression as a form of psychopathology and how it related to other child, family, and environmental variables. The television viewing habits of the subjects were studied somewhat fortuitously as one of several auxiliary interests.

The subjects of the study constituted the entire 3rd grade population of Columbia County, New York (public and private schools) in 1960—875 children. During that first assessment the children were questioned and tested in their classrooms and 85% of their mothers were interviewed along with 71% of their fathers. The modal age of the subjects was 8 and their mean IQ was 104. Ten years later in 1970 we located 735 of the original subjects and convinced 427 to allow us to reinterview them for \$20 payments. An analysis of the sample revealed that those whom we did not succeed in reinterviewing for one reason or another had scored above average on aggression in 1960 and below average on IQ. Thus the sample was somewhat biased toward better adjusted youth. Finally, 12 years later in 1982 we reinterviewed 409 of the original subjects again and collected criminal justice data on 632 of the original subjects.

As described above, one notable result from this study was the finding that early childhood aggression in school is statistically related to adult antisocial and criminal behavior. Numerous other findings from this study have been reported in two books (Eron, Walder, & Lefkowitz, 1971; Lefkowitz, Eron, Walder, & Huesmann, 1977) and many articles (e.g., Huesmann, Eron, Lefkowitz, & Walder, 1984). Of particular interest are the findings concerning the relation between TV violence viewing and later aggression.

In the first wave we found that 8-year-old boys' aggression as determined from peer nominations was correlated with the violence ratings of their favorite shows that they watched most often, as reported by their mothers [$r = .21, p < .01$]. We found absolutely no relation at that time between a girl's aggression and her preference for violent TV shows. These findings were particularly notable because different sources of information were used for assessing the children's TV viewing habits (their mothers) and for assessing their social behavior (their classmates).

In the second wave of this study, 10 years later, we did not find any evidence of a relation between and 18-year-old's TV habits and aggressive behavior, either for boys or girls. We found though that the boys' preferences for more violent shows assessed 10 years earlier when they

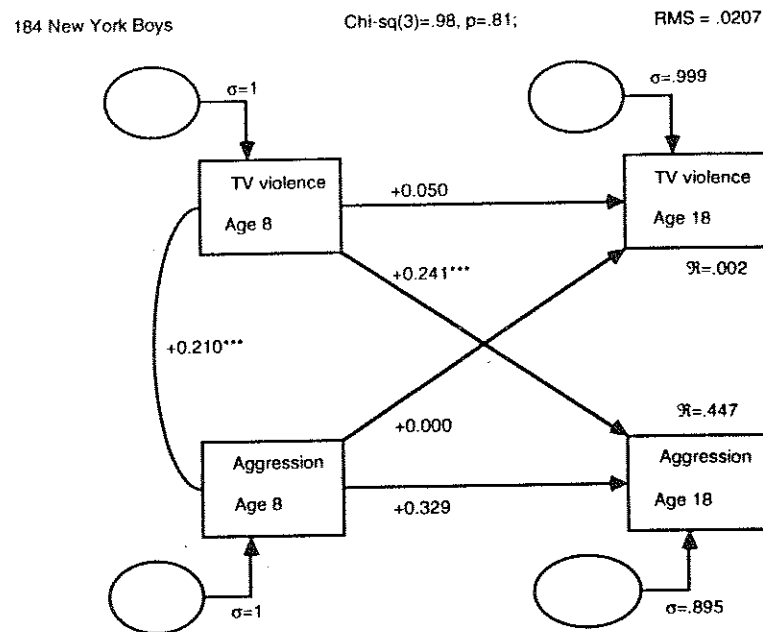
had been in the 3rd grade was also quite predictive of how aggressively they behaved now that they were 18 [$r = .31, p < .001$] (Eron et al., 1972).

We conducted an extensive set of longitudinal regression and structural modeling analyses that led us to conclude that it was likely that early exposure to TV violence was stimulating the later aggression. A key analysis in this series is reproduced in Figure 1. It shows that the pattern of correlations obtained for boys at age 8 and 18 can be explained by a path model which incorporates the following components. Aggressive habits are moderately stable over time while TV viewing habits are not. Viewing violent TV regularly at age 8 is related to concurrent aggressive behavior and stimulates aggressive behavior in succeeding years, leading to a stronger longitudinal than concurrent relation. By the midteens, however, the stimulating effect terminates; so there is no concurrent relation in the late teens.

In the third wave of data collected, when the subjects were on the average 30 years old, we also found no relation between these males' current TV viewing habits and any current aggression or antisocial behavior.² We again found evidence of a longitudinal effect, this time one that spanned the 22 years from age 8 to age 30. For boys, early TV violence viewing correlated with self-reported aggression at age 30 (especially aggression under the influence of alcohol) and added a significant increment to the prediction of seriousness of criminal arrests accumulated by age 30 (as recorded by New York State) independently of relevant social class, intellectual functioning, and parenting variables (Huesmann, 1986). Figure 2 shows the structural model relating early violence viewing to violence ratings of the crimes for which the males were arrested. Males who were never arrested received a score of 0 on the criterion variable. Males who were arrested received a score for the violence of the crime for which the record showed they were charged on a scale used by the New York State Department of Criminal Justice Records at that time.

The structural model reproduces the observed correlations adequately suggesting that a causal model for TV violence viewing as a stimulant for violent crime is at least plausible. Specifically, a model very

² The only exception occurred among the subsample of 87 married males. Within this subsample the males' current frequency of viewing violent programs correlated .22 ($p < .05$) with their spouses ratings of how aggressive they were. Among the general population of males there was no evidence of such a correlation no matter how aggression was measured. It was also true that the males who had been convicted of crimes of any type reported that they watched TV programs of all kinds more frequently ($r = .20, p < .01$), but they did not report watching violent programs more frequently either.



* = # SE different from 0

FIGURE 1. A path model showing the relation between TV violence viewing at age 8 and aggression 10 years later at age 18 (Lefkowitz, Eron, Walder, & Huesmann, 1977).

similar to the one derived above for the analysis of the 10-year data is suggested. Early exposure to TV violence stimulates aggression over several years, and early aggression is a statistical precursor of later criminal behavior, leading to the longitudinal relation from habitual childhood exposure to TV violence to adult violent crime.

Unfortunately, the sample on which this conclusion was based was very small because of technical difficulties in locating the original TV data on subjects who were not interviewed at an intermediate point (TV violence was not a focus of major interest when the study was begun). While the results are significant, they mostly reflect the behavior of a few high violence viewers and must be treated very cautiously. Overall, this study strongly supports the conclusions of laboratory experiments that exposure to media violence stimulates aggression and suggests that, as a result, there may well be a relation for males between early violence viewing and adult aggression and criminality. This study provides no evidence of a similar relation for females.

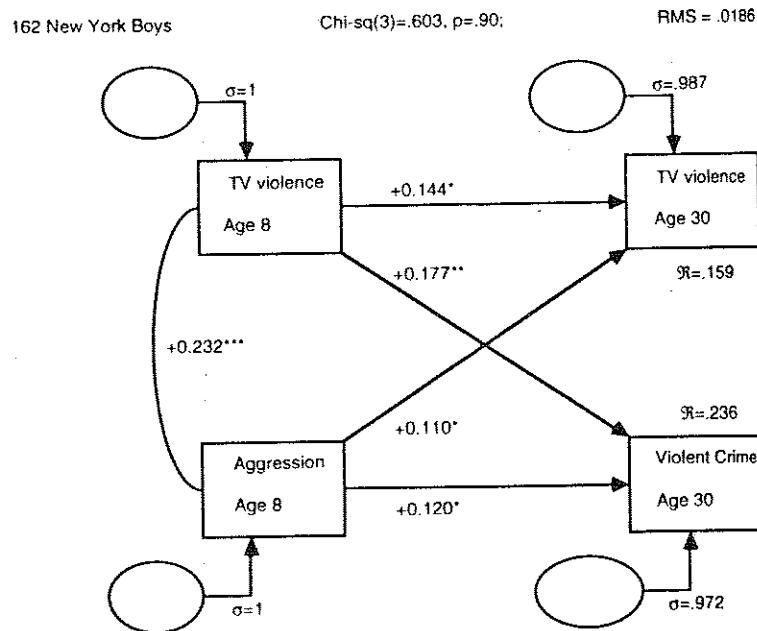


FIGURE 2. A path model showing the relation between TV violence viewing at age 8 and violent criminal behavior 22 years later at age 30 (Huesmann, Eron, Lefkowitz, & Walder, 1984).

A CROSS-NATIONAL LONGITUDINAL STUDY

In the mid 1970s Huesmann and Eron (1986) began a second longitudinal study. In contrast to the New York study in which the examination of TV viewing behavior was an afterthought, this study was specifically designed in order to explore the relation between children's TV viewing habits and their aggressive behavior. Funded by NIMH and small grants obtained by collaborators in other countries, the study was directed at better understanding the generality of the relation between TV violence viewing and aggression across countries with widely differing TV systems, across genders in countries with differing sex-role expectations, and across the ages 6 to 11. Additionally, specific attention was directed at the role of aggressive fantasy in mediating any effects and in the children's identification with TV characters and perception of TV violence as realistic. Other important familial and environmental

variables including parental nurturance, punishment, and rejection, parent's aggressive behavior, parent's TV viewing habits, as well as occupation and socioeconomic status were to be measured as potential moderators of the effect. We were motivated by the conception that the cognitive processes underlying the development of aggression might be strongly affected by environmental and social factors that differ across countries.

In each of five countries—Australia, Finland, Israel, Poland, and the United States—we tested and interviewed substantial samples of 1st and 3rd graders at three one-year intervals as they progressed to the 3rd and 5th grades. The children were interviewed individually (1st graders) or in groups for several sessions. In addition in most countries at least one of their parents was interviewed and tested. The original sample consisted of 1683 children (291 in Australia, 221 in Finland, 186 in Israel, 237 in Poland, and 748 in the United States) about equally divided between boys and girls and 9- and 11-year-olds. By the last year of the study attrition had reduced the total sample to 1297 children. As in most longitudinal studies of aggression there was evidence that the subjects who dropped out of the study had on the average scored higher on initial aggression than those who did not.

The samples in each country were drawn mostly from urban, middle, and lower middle class schools. In the United States about 15% of the sample was drawn from inner city, lower class schools, however; and in Israel about 50% of the sample consisted of kibbutz-raised children. The violent crime rates in these countries varied considerably at the time of this study, with homicides, for example, ranging from about 1 per 100,000 in Poland, to 2 per 100,000 in Israel and Australia, to 3 per 100,000 in Finland, to 10 per 100,000 in the United States. Similarly, the characteristics of the television programming available in each country varied considerably as shown in Table 1. Perhaps the only surprising finding in Table 1 is that the percentage of programming hours with significant violence is more comparable across countries than many would have guessed. One reason for this is the domination of American dramatic TV programs in most of the foreign markets. For example, *Charlie's Angels* was aired in every country in this study during the time of the study.

The collected data from the five countries investigated in the current study clearly indicate that more aggressive children watch more television, prefer more violent programs, identify more with TV characters, and perceive violence as more like real life than do less aggressive children (Huesmann & Bachrach, 1988; Huesmann & Eron, 1986; Huesmann, Lagerspetz, & Eron, 1984). There is substantial variation from

TABLE 1. A Comparison of Violent Television Programming in Five Countries in 1980.

TV statistics	Country				
	Australia	Finland	Israel	Poland	United States
TV sets/1000 population ^a	378	374	150	224	624
TV channels in area	4	2	2 ^b	2	8 ^c
Hours per week in which at least one channel is available	119	60	62 ^d	98	154
Estimated hours of programming per week	476	98	106 ^d	154	1120
Estimated hours of programming per week with "significant violence" ^e	61	14	11	10.5	188
Estimated percent of programming hours with "significant violence"	12.8%	14.3%	10.4%	6.8%	16.8%

^aSource is U.S. Bureau of Census, 1982.

^bOne channel actually is based in Jordan.

^cExcluding cable channels.

^dExcluding weekday educational TV.

^e"Significant violence" is defined as that which raters assigned to the highest or second highest category on a 5-category scale.

Source: Huesmann and Eron, 1986.

country to country, but at least some variable relates in each country. For boys the correlations between overall TV violence viewing and aggression were strongest in the United States ($r = .25, p < .001$), Finland ($r = .22, p < .05$), and among Israeli city boys ($r = .45, p < .01$). They were weakest in Poland ($r = .17, p < .10$), Australia ($r = .13$), and among Israeli kibbutz boys ($r < .10$). For girls the correlations between overall TV violence viewing and aggression were strongest in the United States ($r = .29, p < .001$) and among Israeli city girls ($r = .48, p < .01$). They were weakest in Poland ($r = .17, p < .10$), Australia ($r = .16, p < .10$), Finland ($r = .16$), and among Israeli Kibbutz girls. It is clear from these results that the relation between TV habits and aggression is not limited to countries with large amounts of programming and is no longer limited to boys.

Of course, the correlations obtained are small in terms of variance explained. They account for between 1 and 23% of the variance in aggression. Yet "variance explained" is not necessarily a reasonable measure of the potential importance of these variables. As Abelson (1984) and Rosenthal (1986) have argued, the calculation of "variance explained" may grossly misrepresent the practical and social significance

of a variable. According to the developmental model that we have adopted, children in the age range covered in this study are forming cognitive guides for behavior (e.g., scripts, self-regulating internal standards) that may last into adulthood. Small effects on concurrent behavior can accumulate through a cyclical reinforcing process in which TV violence teaches aggressive behavior and aggressive behavior stimulates violence viewing. Furthermore, because aggression is affected by so many uncontrolled situational and characterological factors in natural settings, one should be skeptical if large portions of variance are explained by single variables. The statistical significance of the correlations should be given more importance than the "variance explained."

Nevertheless, in one group of subjects, Israeli kibbutz-raised children (Huesmann & Bachrach, 1988), the effects were particularly weak. Among these kibbutz children, the reasons for small relations between TV habits and aggression seem clear. Such children view TV violence much less frequently. When they do see violent programs, the observation is often followed by a discussion of the social implications of the violence. In addition, the kibbutz child's society is one designed to rebuke children for any aggressive behavior within society. Given such an environment, the lack of a relation between TV violence and aggression is not surprising.

Given that TV habits were related to concurrent aggression in most countries, one can then ask whether the longitudinal patterns of relations suggest the hypothesized cyclical process by which TV viewing stimulates aggression and aggression leads to more exposure to violent TV. To test this hypothesis, we evaluated in each country a regression model relating TV viewing and behavior in the first two waves to TV viewing and behavior in the last wave. In particular we assumed that the effect of either variable on the other would accumulate over the first two years. The resulting model was evaluated with a system of regression equations in each country. The results are shown in Table 2. The key comparison in each column is between the path coefficient in the row labeled TV(12), representing the effect of TV viewing in the first two waves on later aggression, and the path coefficient in the row labeled AGG(12), representing the effect of aggression in the first two waves on later TV viewing.

Again, there was substantial variation across countries as to which TV habits related most strongly, but a common pattern emerged. For boys in Finland and for both boys and girls in the United States, Poland, and Israeli cities, early TV habits significantly affected the aggressiveness of children at the end of the study even when the children's initial aggressiveness was statistically controlled. Depending on the country,

TABLE 2. A Comparison of Path Coefficients from TV Violence Viewing to Aggression with Coefficients from Aggression to TV Violence Viewing in a Cross-National Comparison

Regression model	Country				
	Australia	United States	Finland	Israeli cities	Poland
	(N = 107)	(N = 221)	(N = 85)	(N = 39)	(N = 84)
	Girls				
AGG(3)=AGG(1) +TV(12)	.66*** .00	.53*** .14**	.65*** .01	.55** .52**	.72*** .14+
TV(3)=TV(1) +AGG(12)	.19+ .08	.29*** .26***	.41*** .15	.31 .38	.00 .03
	(N = 116)	(N = 200)	(N = 93)	(N = 46)	(N = 95)
	Boys				
AGG(3)=AGG(1) +TV(12)	.71*** .08	.68*** .15**	.75*** .21***	.58** .29*	.82*** .14*
TV(3)=TV(1) +AGG(12)	.12 .10	.38*** .10	.32*** .18	.45** .10	.08 -.02

* $p < .10$. ** $p < .05$. *** $p < .01$. **** $p < .001$.
Source: Huesmann and Eron, 1986.

TV violence viewing (girls in the United States, boys and girls in Poland and in Israeli cities), or TV violence viewing coupled with identification with TV characters (boys in the United States and Finland) best predicted changes in aggression. Only in Australia was no longitudinal effect detectable, and only among U.S. girls did early aggression have an effect on later TV violence viewing.

According to our model, once a script for aggressive behavior is stored, whether or not it is ever retrieved may depend on whether it is rehearsed. One form of rehearsal is fantasy. In most countries greater aggressive behavior and more TV violence viewing were associated with more frequent aggressive and heroic fantasies (Huesmann & Eron, 1984, Table 8.4). The strength of the relation varied greatly across samples, but overall the results are consistent with the theory that violent TV (and violent behavior) may stimulate violent fantasies, and violent fantasies may increase the likelihood of violent behavior. Certainly, these data contradict the theory that aggressive fantasies stimulated by aggressive TV might act as a catharsis and reduce the likelihood of aggressive behavior.

What about the possibility that social class or IQ were responsible for the relation between aggression and TV violence viewing? Perhaps less intellectually competent, lower class children behave more aggressively (out of frustration or because they cannot learn nonaggressive scripts) and watch more TV (to obtain the rewards vicariously they are missing in their own lives)? Huesmann and Eron (1986) found that aggression and TV habits were related negatively to the social status of the family and the intellectual competence of the child. However, they also demonstrated with additional regression analyses that early TV habits remained a significant predictor of changes in aggression in most samples even when social class and intellectual competence were controlled statistically. It is worthwhile mentioning at this point an important finding from Huesmann, Eron, and Yarmel's (1987) analyses of the relation between childhood and adult aggression and intellectual competence. On the basis of data spanning the 22 years from age 8 to age 30, it was concluded that childhood aggression interferes with adult intellectual development more than childhood intellectual failure stimulates adult aggression. The implication is clear: A side effect of a child's learning aggressive behavior from violent TV shows might be diminished intellectual achievement by adulthood.

Among the U.S. children, Huesmann and Eron (1986) found that the lower the family's social status, the more aggressive were the children and the more TV violence they watched. This relation was particularly strong for boys. In Israel, it was also true of city boys, but for kibbutz boys and all girls, the relations reversed. Higher status children were more aggressive and watched more violence. In Poland, family income was inversely related to a child's aggression, and girls whose fathers had a higher status job watched less TV violence. In Finland, there was little direct relation between social status or income and aggression. In conjunction with indicators of parental rejection or harsh punishment, however, higher social status was predictive of greater aggression in boys and lesser aggression in girls. These results are puzzling. Part of the problem is undoubtedly that social status was very difficult to measure in Finland, Poland, and Israel. Traditional rankings based on the free-enterprise society of the United States did not apply very well. Moreover, the differences may go deeper. In the United States lower socioeconomic status may both stimulate aggressiveness and be a product of aggression. In societies with greater homogeneity, such effects may not obtain.

On the average, Huesmann and Eron (1986) reported, more aggressive children and children who watched more TV violence had more aggressive parents. Their parents were also more dissatisfied with them

(i.e., rejected them more) and punished them more severely. Before one concludes that parental punishment and rejection stimulate a boy's aggression, however, one must examine the longitudinal relation between rejection, punishment, and aggression with the effects of early aggression partialled out. When this is done, the longitudinal relation between rejection, punishment, and aggression disappears completely in the two countries where there were the two waves of parent interviews necessary to test the hypothesis (the United States and Finland). Of course, it is possible that the self-report measures of rejection and punishment may be distorted or that the major detrimental effects of these behaviors occurred earlier in the child's life. Alternatively, it may be that aggression by the child stimulates rejection and punishment by the parents which in turn, while not directly stimulating aggression, isolates the child more and drives him or her to watch more TV and hence, more violent programs. This would be somewhat consistent with the findings of Heath (Heath & Kruttschnitt, 1986) that childhood exposure to TV violence combined with parental rejection and punishment predict violence in a criminal sample.

Finally, Huesmann and Eron (1986) examined the role of popularity as a mediator. In every country (except perhaps Israel) the more aggressive children are the less popular children. Only in the United States, however, was there evidence that the less popular children watched more TV violence.

In the United States a subsample of high violence viewers also participated in a 2-year intervention designed to mitigate the effects of TV violence on aggression (Huesmann, Eron, Klein, Brice, & Fischer, 1983). The 169 high violence viewers were randomly assigned to a treatment or control group. The treatment group received didactic lessons about the unreality of TV violence during the second year of the study and an attitude change treatment during the third year. By the end of that year the treatment subjects were rated as significantly less aggressive than the control subjects on peer nominations, and the relation between their aggressiveness and TV violence viewing was diminished.

A NETHERLANDS STUDY

At about the same time as the above cross-national study was being conducted in Australia, Finland, Israel, Poland, and the United States, a similar study was being attempted in the Netherlands by Wiegman, Kuttschreuter, and Baarda (1986). Originally intended to duplicate the investigations being conducted in the other countries, the study drew heavily from the work of the other investigators. For a variety of rea-

sons, however, the procedures used in this study eventually deviated substantially from the procedures used in other countries and comparison of exact results is problematic. For example, because they believed that "in the Netherlands the relation between parents and children is less based on authority and more on friendship" (Wiegman et al., 1986, p. 32), they declined to question children or parents about the possibility that any parents might harshly punish their children. A more detailed critique of the methodological problems in this study is presented in Huesmann and Eron (1986). Despite the methodological deficiencies of the Netherlands study, many of the results obtained from that study mirror results in other studies. Very significant positive correlations were obtained for both boys and girls between TV violence viewing and aggression. While the path coefficients from early violence viewing to later aggression were not significant, all of them were in the positive direction. Although the Netherlands' data are generally consistent with other data supporting a longitudinal effect for TV violence, the Netherlands' authors reinterpreted their data and existing data to suggest that low IQ was responsible for the relation. Their reinterpretation was based on a flawed use of structural modeling in their own data, however, and on improper use of partial data taken from preprints issued by the investigators in other countries.

AN NBC STUDY

A more sophisticated use of structural modeling of longitudinal data was undertaken by Milavsky et al. (1982) in their analysis of data collected by NBC during the 1970s. Data on television viewing and peer-nominated aggression were collected on a substantial sample of elementary schoolchildren. Data collection involved repeated assessments, with lags between assessments ranging from a few months to several years.

Milavsky et al.'s findings of positive and mostly significant relations between television violence viewing and aggression (ranging from .13 to .23) are consistent with the findings of the majority of studies in this area. Their study paralleled the findings from the cross-national studies described above in that an equally strong relation between television violence viewing and aggressive behavior was noted for girls compared to boys, and that the relation between overall television viewing and aggression was almost as strong as the relation between violent television viewing and aggression.

Milavsky et al. employed regression analyses similar to those described in the cross-national study above in order to examine longitudinal relations between television habits and aggressive behavior. For each

different lag, they constructed a different regression equation yielding a total of 15 different analyses. In each analysis, later aggression was predicted from early television violence viewing and aggression. As previous research suggests, one would expect to find a substantial relation between early and later aggression. The question to be addressed here is whether early television violence viewing increases one's ability to predict to later aggression above what is predicted from early aggression. In the cross-national study described above, among boys and girls from the cities of the United States, Poland, and Israel, and among boys from Finland, it was demonstrated that early television habits significantly predicted later aggression even after the effect of early aggression was statistically controlled in the regression analyses. There was no such effect for the Australian children. In the Netherlands study, positive coefficients were reported; however, they did not reach statistical significance. Similarly, Milavsky et al. found mostly positive coefficients (12 of 15) in the critical analyses, although only a few were significant on their own. The chances of observing 12 positive coefficients in 15 analyses would be less than 1 in 1000. Thus, their results seem reasonably consistent with the hypothesized model that television violence viewing leads to aggressive behavior. The "causal" coefficients observed by Milavsky et al. increase almost monotonically with the duration of the lag between observations. The coefficients are very small for the short lags and larger for the longer lags, which is what one would expect given a cumulative effect, bidirectional model.

Milavsky et al. reject that their data support the theory that repeated exposure to violent television programming leads to increased aggressive behavior. They suggest that the strength of the positive coefficients observed in their study is not sufficient to make such a conclusion. Additionally, they cite several artifacts that they believe contribute to the observed correlations between television violence viewing and aggression. They argue that (1) high aggressive boys exaggerate their violence viewing, and (2) both violence viewing and aggression are correlated with social class. While one would expect that data from more aggressive boys would be least valid due to their poor reading skills and lower IQs, the appropriateness of removing these subjects whether statistically or physically from the analysis is questionable. One should at least first examine the psychological processes that might be represented by this behavior. Furthermore, it is not clear that aggressive boys who underreported their television violence viewing would have been detected and removed. The drop in correlations when social class is partialled out is also much higher than that reported in most other studies. The measure of social class used by Milavsky et al. differs from most

other studies in that it includes mother's occupation (or lack of occupation). This may be critical because children of working mothers with relatively low-status jobs may be more aggressive and watch more television. Again, before controlling for such a variable, one would want to understand what psychological processes are involved. For example, the mother's presence in the house may serve as a control that limits the extent to which violence viewing could influence aggression.

Because Milavsky et al. ignore developmental theory in the interpretation of their data, they are forced into making merely descriptive statements: "television exposure leads to increased aggressiveness; or aggressive children tend to select violent television programs or some third variables . . . lead (to) both" (p. 114). Not only do these conclusions neglect developmental theory but they are also not mutually exclusive as presented. Although Milavsky et al. do not come to this conclusion, their data are not inconsistent with the hypothesis that repeated exposure to television violence leads to increased aggressive behavior.

A SOUTH AFRICAN STUDY

Botha (1990) conducted a longitudinal field study of 856 South African boys and 914 South African girls between 1977 and 1981. This study is particularly interesting because television was not present in South Africa until just before this study began in 1976. The subjects in the study were all white South African youth who were in the 8th grade in 1977. A stratified random sampling approach guaranteed that they were fairly representative of the population of white 8th grade youth in South Africa. The subjects were interviewed in 1977 when they were in the 8th grade and again 4 years later in 1981 when they were in the 12th grade.

Botha, unlike most other researchers, analyzed total amount of TV viewing by the adolescents rather than violence viewing. These and his measures of aggression were all self-report measures. Nevertheless, he did find positive correlations between total amount of TV viewing and aggression in both the boys and the girls. Furthermore, when he constructed structural models to relate TV viewing and aggression, he found statistically significant positive causal coefficients from TV viewing to aggression for both boys and girls. The effects were not large and were smaller than the effects on aggression of some other measured variables; for example, family and social influences. Nevertheless, it is notable that an effect would be found at all with this age children. They are past the age when most habitual forms of social behavior have developed, and one would expect the effect of any external influence on

habitual social behavior to be reduced. One can speculate that an even stronger effect would have been found with younger subjects.

META-ANALYTIC REVIEWS

One cannot complete a review of the major studies on this topic without mentioning two meta-analyses that have been recently published which summarize the findings of most of the studies conducted over the past 30 years on media violence and aggression. Comstock and Paik (1991) calculated the obtained effect sizes for over 1000 comparisons derived from 185 different experiments, static field studies, and longitudinal studies. After an extensive set of analyses, they concluded that the association between exposure to television violence and antisocial and aggressive behavior is extremely robust. Furthermore, they conclude, "The data of the past decade and a half strengthens rather than weakens the case that television violence increases aggressive and antisocial behavior" (p. 54). Wood, Wong, and Chachere (1991) analyzed 30 comparisons in 23 studies in which the outcome variable was aggression measured in unstructured social interaction. They concluded that exposure to media violence significantly enhanced viewers' aggressive behavior when the findings were aggregated across studies, though the effect was not uniform across investigations.

SUMMARY

The severe negative outcome for children who display antisocial behavior is costly at both individual and societal levels. As the rates of interpersonal violence remain alarmingly high, researchers continue to investigate the causes of such behavior. It is generally accepted that antisocial behavior results when a number of important factors converge. No one factor is viewed as necessary or sufficient to produce long-term antisocial behavior. It is understood by researchers interested in the development of aggressive behavior that repeated exposure to media violence alone is not enough to account for the development of serious antisocial behavior. Media violence is regarded as one potential contributor to the learning environment of children who eventually go on to develop aggressive patterns of behavior.

In this chapter, we describe a theoretical model that could account for the way in which children might learn to behave aggressively from watching violent television. Huesmann's (1988) script theory posits that

social behavior is controlled, to a large extent, by programs for behavior that are established early on in development. These scripts are stored in memory and are accessed as guides for social interactions. The violent scenes that a child observes on television can serve to teach a child to be aggressive through several learning processes as the child not only observes aggressive patterns of behaviors but also witnesses their acceptance and reinforcement.

Several methods for studying the relations between television violence viewing and aggression have been employed. Experimental studies have clearly demonstrated that under well-controlled conditions, the observation of violent scenes observed in the media causes children to behave more aggressively. Static observational studies have demonstrated that the amount of violent television observed by a child is positively related to the child's current aggressivity. Although this relation is not strong compared to the relation between aggression and other salient environmental variables, it is repeatedly observed across studies to be statistically significant and of a magnitude that has been assessed to have real social significance.

The data available from longitudinal studies provide additional support for the hypothesis that television violence viewing leads to the development of aggressive behavior. These longitudinal studies employ a wide range of samples and methodologies. Again, we are not arguing that television violence viewing is the only cause of aggressive behavior. However, the research suggests that the effect of television violence viewing on aggression is relatively independent of other likely influences and of a magnitude great enough to account for socially important differences.

While children are likely to imitate specific behaviors observed on television, we suggest that the long-term effects are likely to be a result of the development of scripts for behavior that are observed on television and enacted by the child who is reinforced in his or her natural environment for displaying such aggressive behavior. We have also argued that not all children who observe a steady diet of violent television go on to display patterns of aggressive behavior. Important environmental, cultural, familial, and cognitive differences may exacerbate or mitigate such long-term effects.

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CHAPTER 8

RISK AND RESOURCE VARIABLES IN CHILDREN'S AGGRESSIVE BEHAVIOR

A Two-Year Longitudinal Study

ERIC F. DUBOW AND GRAHAM J. REID

INTRODUCTION

Interpersonal aggression creates numerous problems for victims, perpetrators, and society in general. The prevalence estimates of conduct disorder in children and adolescents are approximately 5% (e.g., Offord, Boyle, & Racine, 1991). Definitions of aggression are numerous and include aggressive behaviors which vary in levels of severity. Eron (1987) defined aggression as, "an act that injures or irritates another person" (p. 435). This definition subsumes most others and avoids issues related to intentionality, which may be difficult to ascertain in children.

Many studies have identified risk factors for aggression. The strongest risk factor appears to be the presence and pattern of early aggression

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