

DOES TELEVISION VIOLENCE CAUSE AGGRESSION? ¹

LEONARD D. ERON ²

University of Illinois at Chicago Circle

MONROE M. LEFKOWITZ

New York State Department of Mental Hygiene, Albany

I. ROWELL HUESMANN

Yale University

LEOPOLD O. WALDER

*Organization for Research in the Behavioral Sciences,
Greenbelt, Maryland*

WITH the increasing prominence of violence in our society, social scientists have been turning their attention to the antecedents of aggressive behavior in children and adults. Television programming with its heavy emphasis on interpersonal violence and acquisitive lawlessness has been assigned a role both in inciting aggression and teaching viewers specific techniques of aggressive behavior. The relation between overt aggression and television habits has been demonstrated in a few survey studies which, however, because of the nature of surveys have not been able to discriminate cause and effect (Bailyn, 1959; Eron, 1963; Schramm, Lyle, & Parker, 1961).

On the other hand, manipulative laboratory experiments have demonstrated an immediate effect on the extent of aggressive behavior of subjects who have witnessed aggressive displays on film (Bandura, Ross, & Ross, 1963a; Berkowitz, Corwin, & Heironimus, 1963). The latter studies, however, can be criticized for not duplicating real-life television viewing situations and possibly not accounting for anything more than a transient effect on the viewer. Hartup and Yonas (1971) stated in their review of developmental psychology in the latest *Annual Review of Psychology*,

Current studies of the childhood determinants of aggression are not extensive. The report of a presidential commission, *Violence and the Media* (Baker & Ball, 1969),

¹This research was supported by Grant M1726 from the National Institute of Mental Health and Contract No. HSM 42-70-60 from the Surgeon General's Scientific Advisory Committee on Television and Social Behavior. Thanks are also due to the New York State Department of Mental Hygiene for their support and to Anne Karabin, Marjorie Kline, Ann McAleer, Victor Pompa, and Ann Yeager who served as research assistants.

²Requests for reprints should be sent to Leonard D. Eron, Department of Psychology, University of Illinois, Box 4348, Chicago, Illinois 60680.

indicates that child psychologists possess much information concerning the determinants of aggression but very little stemming directly from naturalistic sources [p. 375].

One possible way of utilizing survey procedures to demonstrate cause and effect is to use a longitudinal context. By contrasting the magnitude of contemporaneous and longitudinal correlations between two sets of variables, it is possible to account more clearly for which of the variables is antecedent and which consequent. The authors have now accumulated data on both aggressive behavior and television viewing habits over a 10-year period in a large group of subjects first seen when they were 8-9 years of age. Thus, we can implement such an analysis.

The hypotheses of this research are that a young adult's aggressiveness is positively related to his preference for violent television when he was 8-9 years old and, furthermore, that his preference for violent television during this critical period is one cause of his aggressiveness.

METHOD

Longitudinal data were collected on 427 teenagers of an original group of 875 children who had participated in a study of third-grade children in 1960 (Eron, 1963; Eron, Walder, & Lefkowitz, 1971). The original 875 constituted the entire third-grade population of a semirural county in New York's Hudson River Valley, while the 427 subjects were those who could be located and interviewed 10 years later.

The information collected about these subjects in both time periods falls into two classes: (a) measures of aggression and (b) potential predictors of aggression. During the third-grade interviews, four different data sources had been used: the subject, his peers, his mother, and his father. Ten years later, the data sources were the subject and his peers. For convenience, this later time period will be designated as the thirteenth grade.

The variables used in the study are listed in Table 1. Two variables are of particular importance: peer-rated

TABLE 1
MEASURES OF AGGRESSION AND POTENTIALLY RELATED VARIABLES STUDIED AT TWO DIFFERENT TIMES

Variable	Source
Third grade	
Measure of aggression	
Child's aggression (AGG3)	Peer ratings
Variables potentially related to aggression	
Father's occupational status	Father's report
Parents' aspirations for child	Parents' report
Parents' mobility orientation	Parents' report
Ethnicity of family	Parents' report
Mother's religiosity (frequency of church attendance)	Mother's report
Parental nurturance of child	Mother's report
Parental rejection of child	Mother's report
Parental punishment of child	Mother's report
Child's identification with father	Father's and child's report
Child's identification with mother	Mother's and child's report
Child's confessing to parents	Parents' report
Father's aggressiveness	Walters-Zak test
Mother's aggressiveness	Walters-Zak test
Parental disharmony	Parents' report
Child's IQ	Test
Child's hours of watching television	Mother's report
Child's preference for watching violent television (TVVL3)	Mother's report on favorite programs and violence scores by independent raters
Thirteenth grade	
Measures of aggression	
Subject's aggression (AGG13)	Peer rating
Subject's antisocial behavior (ASB13)	Subject's report
Subject's psychological predisposition to delinquency (MMPI-49S)	Sum of Scales 4 + 9 on MMPI
Variables potentially related to aggression	
Father's occupational status	Subject's report
Subject's occupational aspirations	Subject's report
Subject's hours of watching television	Subject's report
Subject's preference for watching violent television (TVVL13)	Subject's report of favorite programs and violence scores by independent raters

aggression and preference for violent television programs. In the third grade, peer-rated aggression scores were obtained by asking each child to nominate any of his classmates on 10 "guess who" items describing aggressive behavior; for example, "Who pushes and shoves other children?" "Who takes other children's things without asking?" "Who starts a fight over nothing?" "Who says mean things?" These aggression items were interspersed among a series of other peer nomination questions. The validity and reliability of the aggression measure have been discussed elsewhere (Eron et al., 1971; Walder, Abelson, Eron, Banta, & Laulich, 1961).

The peer rating instrument was revised slightly for the thirteenth-grade study. One item which was deemed inappropriate for 19-year-old subjects was dropped. Furthermore, since the subjects were no longer in school, the procedure was administered individually in a face-to-face

interview. The number of possible peers any subject could nominate was widened beyond his own third-grade classroom to include his classmates through high school. Thus, each subject was rated by a larger set of raters in the thirteenth grade which included many of the raters from the third grade.

In the third grade, the children's preferences for violent television were obtained by asking each mother for her child's three favorite television programs. All programs mentioned were then categorized as violent or nonviolent by two independent raters with 94% agreement in their ratings. Differences in the remaining 6% of the programs were resolved by mutual discussion between the raters. Each subject received a score according to the number of violent television programs he was reported by his mother as favoring. Scores ranged from 1 (for no violent programs) to 4 (for three violent programs).

In the 10-year follow-up study, each subject *himself* was asked for his four current favorite television programs. All programs were then categorized for presence or absence of violence by two independent raters who were only a few years older than the subjects themselves. Scores were assigned to each program on the basis of agreement between the raters. If they both agreed a program was nonviolent, the program received a score of 0; if they both agreed it was violent, the score was 2; if they disagreed in categorization, the program was assigned a score of 1. Here again there was good agreement between the two raters. They agreed on 81% of 125 programs mentioned by the subjects. The score for each subject was the sum of the violence ratings of the four programs mentioned.

The designation by these raters of violent and non-violent programs agreed very well with the assignment of programs by Feshbach and Singer (1971) to aggressive and nonaggressive diets in their field experiment (see below). Furthermore, the judgments of our raters were in close agreement with the results obtained by Greenberg and Gordon (1970), who did an extensive rating study in which they used as raters both established television critics (approximately 45) and 300 subjects randomly selected from the Detroit, Michigan, telephone book. Of the 20 programs which Greenberg and Gordon indicated had the highest violence ratings, 19 were selected as violent by our raters. For the 427 cases in the 10-year follow-up study, there was a correlation of .94 between the Greenberg-Gordon average ratings and our ratings.

RESULTS

The 427 subjects studied in both the third and thirteenth grades consisted of 211 males and 216 females whose modal age at the time of the thirteenth-grade interview was 19. The sample was at the higher end of the average range in intelligence with a mean IQ of 109 and was somewhat middle class in social status. The dropout rate from participation in the study between the third and thirteenth grade was considerably higher for subjects who displayed high aggression in the third grade than for those who displayed low aggression. For example, 57% of the low quartile in aggression were retained in the follow-up sample, while only 27% of the high quartile were retained. This can be explained by a number of factors including the finding that residential mobility was correlated significantly with aggression in the sample.

Preliminary analysis indicated that the measures of aggression distinguished the males from the females. There were statistically significant differences between males' and females' mean scores on every measure of aggression in both grades.

The differences were more pronounced in the thirteenth grade. In addition, a principal component factor analysis of subjects' sex and the variables that were used in the study yielded a first principal factor whose largest loading was for the subjects' sex and whose next largest loadings were for the measures of aggression. Finally, a comparison of girls in the highest quartile on aggression with those in the lowest quartile revealed a difference in MMPI profiles; the high-aggressive girls were significantly more masculine in their interests and attitudes. Because of these findings, the data for males and females were analyzed separately.

Correlations between Preference for Television Violence and Aggression

The correlations between preference for television violence and aggression at both grade levels are presented separately for boys and girls in Table 2.

These correlations must be interpreted in light of the total number of correlations being computed for the sample of 427 subjects and the distribution of the variables. Because of the large number of potential correlations, only those with a probability less than .01 on a two-tailed test were considered significant and only those with a probability less than .001 on a two-tailed test were called highly significant. On the other hand, it should be pointed out that the unusual skewness and kurtosis of many of the variables may impose a limit on the size of their intercorrelations.

From Table 2, one can see that there is a highly significant relation between boys' preferences for violent television programs in the third grade (TVVL3) and their peer-rated aggression in the thirteenth grade (AGG13). Similarly, there is a significant contemporaneous relation between the boys' television preferences in the third grade and peer-rated aggression in the third grade (AGG3). Neither of these effects was apparent for females. While the correlation between third-grade preferences and thirteenth-grade peer-rated aggression explains only 10% of the variance in aggression, 10% is impressive when one considers the probable limitations on the size of the correlation imposed by the skewed distributions of the variable, the large number of variables affecting aggression, the comparatively small explanatory power of these other variables (see below), and the 10-year lag between measurement times. The extremely low likelihood of achieving such a correlation by chance

TABLE 2
CORRELATIONS AMONG VIOLENCE RATINGS OF PREFERRED TELEVISION PROGRAMS AND MEASURES OF
AGGRESSION AT TWO DIFFERENT PERIODS

	TVVL3	AGG3	TVVL13	AGG13	ASB13	MMPI-49S13
Boys						
TVVL3	1	.21*	.05	.31*	.10	.12
AGG3		1	.01	.38*	.14	.21
TVVL13			1	-.05	.01	.06
AGG13				1	.49*	.39*
ASB13					1	.46*
MMPI-49S13						1
Girls						
TVVL3	1	.02	.08	-.13	-.02	-.05
AGG3		1	-.08	.47*	.01	.13
TVVL13			1	-.05	-.10	.11
AGG13				1	.23*	.28*
ASB13					1	.45*
MMPI-49S13						1

Note.—The number 3 or 13 following a variable indicates the period, third grade or thirteenth grade, when the data were obtained. TVVL is a measure of preference for television violence. AGG = peer-rated aggression; ASB = self-rating of frequency of antisocial behavior; MMPI-49S = sum of *T* scores on Scales 4 and 9 of MMPI.

* Indicates correlation is significantly different from zero beyond .01 level of confidence.

is a good indicator of the strength of the relation between preference for violent television at age 8 years and peer-rated aggression at age 19.

As has been pointed out previously (Eron et al., 1971), when distributions are unusual, an analysis of variance may, more clearly than a product-moment correlation, reveal the relation between the two variables. Hence, the male subjects were parti-

tioned into low, medium, and high television violence groups, representing approximately the lowest 10%, the middle 80%, and the upper 10%, respectively. The results of one-way analyses of variance on this independent variable with aggression measures as the dependent variables are shown in Table 3. Now one can see that there is a highly significant relation between preference for violent

TABLE 3
MEAN AGGRESSION SCORES AS A FUNCTION OF TELEVISION VIOLENCE RATINGS OF PROGRAMS
PREFERRED BY BOYS IN THIRD GRADE

TVVL3	<i>n</i>	AGG3		AGG13		ASB		MMPI-49S	
		<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Low	31	9.06	9.91	5.14	5.05	25.58	12.12	121.97	20.50
Medium	139	11.19	11.54	8.14	9.88	22.06	12.69	122.50	19.33
High	14	21.00	13.79	16.46	13.01	30.86	14.23	135.86	18.14
Total	184	11.58	11.75	8.27	9.86	23.33	12.90	123.42	19.67
<i>F</i> ^a		5.43****		6.82***** <i>t</i> = 4.04***		3.63**		3.11*	

Note.—Abbreviations: AGG = peer-rated aggression; ASB = self-rating of frequency of antisocial behavior; MMPI-49S = sum of *T* scores on Scales 4 and 9 of MMPI.

^a Because of heterogeneity of variance, a *t* test between the two most discrepant means for AGG13 was performed. The *t* was conservatively evaluated by using degrees of freedom equal to the *n* for the smallest group, that is, 14.

* *p* < .05.
** *p* < .03.
*** *p* < .01.
**** *p* < .005.
***** *p* < .001.

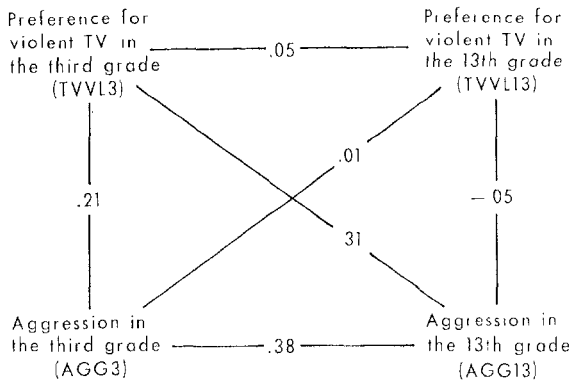


FIG. 1. The correlations between a preference for violent television and peer-rated aggression for 211 boys over a 10-year lag.

television in the third grade and aggression in the thirteenth grade, whether the measure is one of peer-rated aggression or self-ratings of aggression (antisocial behavior and MMPI-49S).

Causal Analysis

Having established that there exists a highly significant relationship between a preference for violent television in the third grade and aggressive habits in the thirteenth grade, one can consider the alternative causal explanations for this phenomenon. Of course, one cannot demonstrate that a particular hypothesis is true. One can only reject untenable hypotheses and present evidence on the plausibility of the remaining hypotheses.

Cross-lagged correlations. Consider the pattern of correlations diagrammed in Figure 1; the correlations on the diagonals are called cross-lagged correlations. The cross-lagged correlation between a preference for violent television in the third grade and thirteenth-grade aggression was highly significant. When coupled with the lack of a relation between third-grade aggression and a preference for violent television in the thirteenth grade, this significant correlation supports the hypothesis that preferring to watch violent television is a cause of aggressive behavior. This causal hypothesis is diagrammed in Figure 2a. The probability of a chance occurrence of the difference between the cross-lagged correlations is low (Fisher's $z = 3.07$, $p < .002$); however, a few rival hypotheses are seemingly consistent with the difference and deserve consideration.

One alternative hypothesis is that preference for violent television in the third grade stimulates con-

current aggression, and this aggression leads to thirteenth-grade aggression or at least is being re-measured in the thirteenth grade. The corresponding causal chain is diagrammed in Figure 2b. This interpretation can be rejected because if it were true, the relation between the end points of the causal sequence would have been no stronger than the product of the relations between all adjacent intermediate points. But the correlation between the end points was .31, which was much higher than the product of the intermediate correlations.

For a similar reason, the causal chain diagrammed in Figure 2c can be eliminated as an alternative hypothesis. If early aggression caused a preference for violent television which in turn contributed to later aggression, the correlation between early and later aggression would have been less than the product of the two intermediate correlations. It was not.

One cannot reject so easily the more realistic alternative hypothesis diagrammed in Figure 2d. This causal hypothesis asserts that early aggression causes both contemporaneous preferences for violent television and later aggression. Part of this hypothesis, that early aggression contributes to later aggression, is quite probably true. What is of interest here, though, is whether or not the relation between early television preferences and later aggression can be explained as an artifact of early aggression. One can obtain evidence to refute this idea by

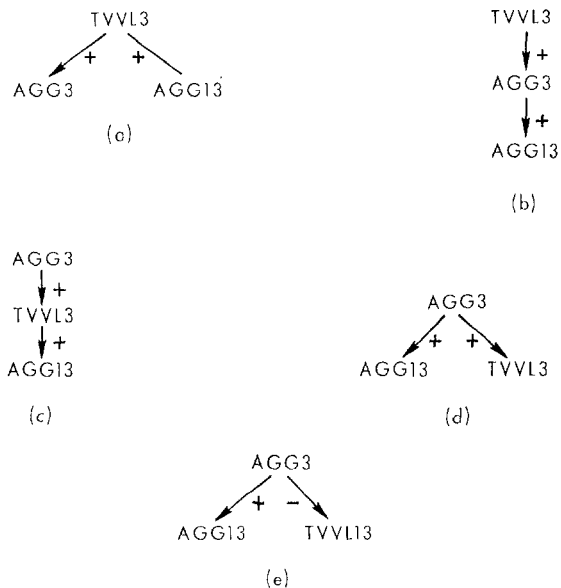


FIG. 2. Five feasible causal hypotheses for the correlations presented in Figure 1.

computing the partial correlation between third-grade television violence (TVVL3) and thirteenth-grade aggression (AGG13) while controlling for third-grade aggression (AGG3). If the hypothesis diagramed in Figure 2d were the complete explanation of the correlation between early television preferences and later aggression, then the partial correlation would have been zero. But it was not. It was .25 or a distance of only .06 below the original correlation between a preference for television violence in the third grade and thirteenth-grade aggression. Hence, the hypothesis diagramed in Figure 2d is implausible as a complete causal explanation.

The final plausible alternative to be considered is that early aggression causes a diminished preference for violent television. This theory is diagramed in Figure 2e. If one views the cross-lagged correlations as deviations from the initial cross-correlation, then the zero correlation between early aggression and later television preferences might indicate that early aggression had reduced a preference for violent television. However, as Rozelle and Campbell (1969) have indicated, the most appropriate base line is not the early contemporaneous correlation, but the average of the two contemporaneous correlations attenuated for the reliability of the variables. The higher the reliabilities, the less is the attenuation. With a conservative assumption of a very high temporal reliability of .70, the base line for Figure 1 would be $[(.21 + (-.05)) \times \sqrt{.70 \times .70}] / 2 = .06$. With this correction, the hypothesis that aggression diminishes a preference for violent television becomes untenable, since the cross-lagged correlation from early aggression to later television preferences is very close to the base line.

As Rozelle and Campbell (1969), Kenny (in press), and others have pointed out, the validity of cross-lagged panel correlation inferences depends on the assumption that the underlying factor structure is stationary over time. If it is not, one must be very careful about the inferences drawn. The large difference between the third- and thirteenth-grade synchronous correlations is indicative of lack of stationarity and necessitates consideration of some artifactual effects.

One alternative is that the aggression measure increased in reliability between the third and thirteenth grades. Such an increase would have caused the measured correlation between third-grade television violence and thirteenth-grade aggression to

increase even though the true correlation did not change. However, the reliability of the peer-rated aggression variable in the third grade was measured by a variety of methods and consistently found to be between .85 and .95 (Walder et al., 1961). Hence, an increase in reliability is not a plausible explanation of the pattern.

Similarly, a decrease in the reliability of the television violence ratings in the thirteenth grade could have caused the decrease in the correlation between third-grade aggression and thirteenth-grade television violence over the synchronous correlation. Low reliability for thirteenth-grade television violence is in fact plausible since thirteenth-grade television violence correlates poorly with most other variables. However, there is little evidence that third-grade television violence had much higher reliability. Furthermore, the reliability of thirteenth-grade television violence could not affect the cross-lagged correlation from television violence to aggression. Hence, a decrease in the reliability of the television violence variable is not sufficient to explain the pattern of cross-lagged correlations.

Basing the causality argument on the finding that the cross-lagged correlation is greater than the initial synchronous correlation raises another question. Was the increase significant? It is not appropriate to compare the cross-lagged correlation directly with the third-grade synchronous correlation since that correlation should erode over time. Using Kenny's (in press) method for estimating erosion rates yields a rate of .605 for the correlation between television violence and aggression. Thus, one should compare the cross-lagged correlation of .31 with $.605 (.21) = .127$. For $N = 184$, this comparison yields a Fisher's z of 2.33 which is significant at the .02 level.

On the basis of the cross-lagged correlations and the significant partial correlation between early preferences for violent television and later aggression with early aggression controlled, one concludes that the single most plausible causal hypothesis is that a preference for watching violent television in the third grade contributes to the development of aggressive habits. This does not mean that other variables are not of equal or greater importance in stimulating aggression, but only that a preference for television violence and the viewing behavior that the preference indicates probably are independent and important causes of aggressive habits.

Partial correlations. None of the data presented up to this point sheds evidence on the possibility that another variable such as IQ, social class, parental punishment, or parental aggression might have stimulated both the child's preference for violent television and his aggressiveness. However, one can test some of these hypotheses by computing the partial correlations between television violence and aggression with such variables controlled. Table 4 contains these partial correlations. Neither the child's aggression in the third grade, social class, mobility orientation of parent, IQ, parental punishment, parental aspirations for child, nor parental aggression accounts for the relationship. Nor can the relation be explained by the total number of hours of television watched by the subject in either the third or thirteenth grades.

Multiple regression. As Darlington (1968) pointed out, one can treat the standardized coefficients in a multiple regression equation as measures of the causal contributions of the predictor variables to the criterion variable. This approach assumes that all causal variables not in the regression equation are uncorrelated with those that are and that the criterion variable is not "causing" any predictor variable. While it is quite possible that these assumptions are violated, it is still worth while to examine the coefficients as approximate

TABLE 4

PARTIAL CORRELATIONS BETWEEN TVVL3 AND AGG13 WITH OTHER VARIABLES CONTROLLED

Controlled variable	<i>n</i>	Partial correlation between TVVL3 and AGG13
None	184	.31
Third-grade variables		
Peer-rated aggression	184	.25
Father's occupational status	140	.31
Child's IQ	179	.28
Father's aggressiveness	140	.30
Mother's aggressiveness	184	.31
Punishment administered	184	.31
Parents' aspirations for child	140	.30
Parents' mobility orientation	140	.31
Hours of television watched	184	.30
Thirteenth-grade variables		
Father's occupational status	182	.28
Subject's aspirations	149	.28
Subject's hours of television watching	183	.30

Note.—Abbreviations: TVVL3 = a measure of preference for television violence in the third grade; AGG13 = peer-rated aggression in the thirteenth grade.

TABLE 5

MULTIPLE REGRESSION PREDICTION OF THIRTEENTH-GRADE AGGRESSION (AGG13) FROM THIRD-GRADE PREDICTORS

Step entered	Predictor	Multiple correlation	Final standardized coefficients for predictors
1	Television violence (TVVL3)	.31	.29
2	Parents' mobility orientation	.41	.28
3	Child's identification with mother	.44	-.03
4	Parental nurturance of child	.46	-.20
5	Parental disharmony	.47	.11
6	Parents' aspirations for child	.48	-.13
7	Child's IQ	.49	-.11
8	Mother's religiosity (frequency of church attendance)	.50	.09
9	Child's identification with father	.51	.12
10	Ethnicity of family	.51	-.09
11	Parental rejection of child	.52	.08
12	Parental punishment of child	.52	-.09
13	Child's confessing to parents	.52	-.07
14	Father's aggressiveness	.53	.06
15	Child's hours of watching television	.53	-.03
16	Mother's aggressiveness	.53	-.03
17	Father's occupational status	.53	.02

measures of causal contributions. Hence, a multiple regression equation was computed by a stepwise method that entered the third-grade variables into the equation in order of their utility in predicting the criterion variable, thirteenth-grade aggression. The regression equation shown in Table 5 predicts thirteenth-grade aggression solely from third-grade variables.

The order in which the variables were entered reveals that a preference for watching television violence was the most "useful" third-grade variable in the prediction. It explained more of the variance than any other predictor. More important, however, for a causal analysis are the standardized regression coefficients in the final regression equation. Such a coefficient can be interpreted as the contribution of the predictor variable to "causing" the criterion variable independent of the other predictor variables. The coefficients in Table 5 show that a preference for violent television in third grade is *the major contributor* to thirteenth-grade aggression among the third-grade variables. This finding supports the hypothesis that a preference for watching violent television in the third-grade time period is a cause of aggressive habits later in

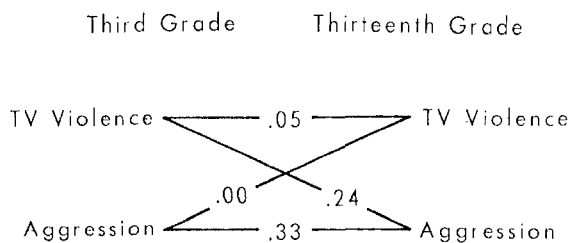


FIG. 3. The path coefficients for a preference for watching violent television and peer-rated aggression.

life independent of the other causal contributors studied.

Path analysis. A more specialized technique for using multiple regression coefficients to estimate causal effects is path analysis (Heise, 1970). The path coefficients for television and aggression are shown in Figure 3. These coefficients are standardized partial regression coefficients. In other words, the path coefficient from third-grade television violence to thirteenth-grade aggression is the coefficient of third-grade television violence in a regression equation predicting thirteenth-grade aggression with third-grade aggression controlled. The obtained pattern of path coefficients adds further credence to the argument that watching violent television contributes to the development of aggressive habits.³

DISCUSSION

The above results indicate that television habits established by age 8–9 years influence boys' aggressive behavior at that time and at least through late adolescence. The more violent are the programs preferred by boys in the third grade, the more aggressive is their behavior both at that time and 10 years later. This relation between early television habits and later aggression prevails both for peer-rated aggression and for self-ratings of aggression. Actually, these early television habits seem to be more influential than current viewing patterns since a preference for violent television in the thirteenth grade is not at all related to concurrent aggressive behavior, nor are early television habits related to later television habits.

It would be very difficult to explain these results as methodological artifacts. While the peer-rated

³The authors are indebted to John M. Neale, State University of New York at Stony Brook, for this path analysis of our data and to David Kenny, Northwestern University, for suggestions regarding interpretation of the cross-lagged correlations.

aggression measure possesses demonstrated reliability (Walder et al., 1961), the thirteenth-grade scores represent more than the temporal reliability of the third-grade measure. Not only had 10 years of behavior intervened between the measurement periods, but the set of raters of each subject was substantially different as well. It is also unlikely that the findings were produced by a common method rather than content. Method refers to the form of the measuring device and the procedure for obtaining and calculating the score; content refers to what one intends to measure. Feshbach (1970), for example, warned that the

predictive utility of sociometric, projective, and inventory measures is limited by the substantial method variance yielded by each procedure, and it is evident that the more dissimilar the test of aggression is to the aggression criterion, the weaker are the relationships obtained [p. 181].

The peer-rated aggression measure employed in this study should not be susceptible to such criticism as it has been extensively validated over a 10-year period using a variety of techniques ranging from Campbell and Fiske's (1959) multitrait, multi-method technique to factor analysis. Peer-rated aggression scores agree closely with teacher ratings, clinical referrals, and overt behavior measured by such devices as the Iowa Aggression Machine (Williams, Meyerson, Eron, & Semler, 1967).

The ratings of the television programs for violence content also possess demonstrated reliability, as noted above, and were in close agreement with ratings made by at least two other groups (Feshbach & Singer, 1971; Greenberg & Gordon, 1970).

While only preferences for violent television were measured in both third and thirteenth grades, it is reasonable to assume that a child's preference for a television program is very highly correlated with the length of time that he attends to that program. The report of television preference in the third grade was made by the mother who probably was strongly influenced by her child's actual viewing habits, especially since the question regarding television preference was asked immediately following the question concerning the length of time the child watched television. Hence, it seems fair to conclude that a preference for violent television is indicative of viewing violent television by the child, particularly in the third grade. Furthermore, since the programs mentioned were the preferred ones, not only is it likely that they watched these

programs regularly but that they also attended to the programs when they watched them. This would be a necessary condition for most theoretical explanations of a violence effect. While minor variations between preferences and watching certainly must have occurred, it is difficult to see how such variations could have enhanced our results.

These findings of a direct positive relation between the viewing of television violence and aggressive behavior on the part of the viewer corroborate in a long-term field study what has already been demonstrated as a short-term effect in the laboratory (Bandura et al., 1961, 1963b; Berkowitz, 1964; Berkowitz & Rawlings, 1963). Because the latter are manipulative studies in which systematically varied treatments were administered to randomly selected subjects under controlled conditions, statements about cause and effect relations based on their findings can be made with more confidence perhaps than those based on findings of field studies. In such studies, many uncontrolled variables are unaccounted for, and observation and measurement cannot be as precise. We feel that our findings relating television violence and aggressive behavior over a 10-year period strengthen the conviction that this is indeed a real relation. The causal direction indicated for the relation is that viewing violence regularly on television at age 8 leads to more aggressive behavior on the part of the viewer at that time and also in subsequent years than does viewing nonviolent programs. Thus, the significance of the laboratory studies is extended to indicate that the influence of television violence is not confined to short-term effects.

The laboratory studies of Bandura (Bandura, 1965; Bandura et al., 1961, 1963a, 1963b) furnish a theoretical model to account for these results. Bandura and his associates have demonstrated that aggressive behaviors new to the subject's repertoire of responses, as well as those already well established in his repertoire, can be evoked by observation of models performing such aggressive behaviors. The fact that the model does not get punished for the aggressive behaviors he develops serves to lower whatever inhibitions subjects have against the expression of similar behaviors. The likelihood of performance of the observed aggressive behaviors is stronger when the model is rewarded for his aggressive behavior (Bandura, 1965). It is not unusual on the more violent television programs for central characters to obtain desirable goals by violent

tactics. Continued exposure to such models probably strengthens the conviction that these behaviors are permissible, and observation of acquisition of desired goals by aggressive behaviors increases the probability of performance of these behaviors by the observer. It is interesting in this regard that the more the subjects watch television at age 19 and the more violent the programs they prefer, the more likely are they to believe that situations depicted on television crime stories and westerns are realistic representations of life ($r = .28$ between judged realism of television programs and number of hours television is watched; and $.36$ between judged realism and television violence). Thus, subjects who watch television for many hours and prefer violent programs do not consider these aggressive behaviors as deviant but as appropriate ways of solving real-life problems.

The lack of an effect of television violence on girls also corroborates the Bandura laboratory studies which have consistently found that boys perform significantly more imitative aggression than girls (Bandura et al., 1961, 1963b). Why this is so probably has to do with the differential socialization of boys and girls in regard to aggression. Very early in life, girls learn that physical aggression is an undesirable behavior for girls, and so they acquire other behaviors more suitable to expectations for girls. Since they do not learn physical aggression as a response to instigation, they are rarely either rewarded or punished for such behavior and thus are not responsive to aggressive cues in the environment. Bandura (1965) has shown that when girls are positively reinforced for imitating aggressive behavior, they significantly increase such behavior and respond in a manner more similar to boys who are reinforced for the same behaviors. The results of Hokanson and Edelman (1966) would support this contention that lowered aggression levels in females are a function of lack of reinforcement for aggressive behavior. They found that females did not demonstrate the quickened reduction of physiological arousal after the opportunity to counteraggress against a confederate of the experimenter who had aggressed against them. However, such quickened reduction of heart rate and blood pressure to basal levels was routinely seen in male subjects. Finally, the frequency of occurrence of violently aggressive females shown on television is somewhat low. Hence, the female

viewer is less likely to encounter an aggressive model to imitate.

It is interesting that the aggressive girls in the present sample had significantly higher masculinity scores on the MMPI. This suggests that in the past they had been reinforced for emitting aggressive (masculine) behaviors and were thus sensitive to aggression-arousing cues in the environment in the same way that boys are.

Regardless of the theoretical explanation of the results, however, the data support the concept of a critical developmental period in which the child is susceptible to the influence of violent television. His preference for violent television at ages 8 and 9 influenced his current aggressiveness and his aggressiveness 10 years later, but by age 19 his current preferences were unrelated to his aggressiveness. From this one might surmise that the role of imitation in the formation of the child's personality decreases drastically between ages 9 and 19.

One must compare the results of the current study with the somewhat different recent findings of Feshbach and Singer (1971). In a bold attempt to compromise between laboratory manipulation and a field setting, they provided findings which would indicate that the viewing of aggressive programs on television leads to a diminution of aggressive behavior on the part of some boys. Feshbach and Singer regulated the amount of television aggression viewed by their subjects over a six-week period by prescribing an aggressive or nonaggressive diet of television programs to two groups of subjects. The subjects were boys enrolled in residential private schools and homes for the underprivileged. The subjects watched television in groups of 10-18 boys at set times in specified locations. In two of the schools, participation by the subjects was compulsory. There was, of course, no voluntary choice of television programs. There are indications that at least initially this lack of preference was resented by boys assigned to the nonviolent diet since it meant they could not watch their favorite programs. In a few cases, the experimenters, in order to retain the cooperation of the subjects, permitted the boys in the nonaggressive group to watch one of the aggressive programs. Although all subjects were given the same cover story, some guessed the real purpose. Feshbach and Singer found that, of the boys around 13 years old, those who were exposed to the aggressive

television diet decreased in manifestations of aggression, while the control subjects increased in aggression. Feshbach and Singer's limited and special sample, their subjects' ages, and their methodology all introduce factors sufficient to explain the discrepancy between their results and ours.

Actually the research of Feshbach and Singer addressed itself to a different question than did the present research which is more concerned with the long-range effects of viewing television violence and with the consideration of more pervasive dispositions. In this regard, it is of interest that Feshbach and Singer used the peer rating measure which we had developed for our studies (Walder et al., 1961) in order to assess preexperimental aggression levels of their subjects and thereby separate them into high-aggressive and low-aggressive subsamples. They found:

Regardless of experimental group, boys who score high on the peer aggression nomination measure display about twice as much aggressive behavior towards peers as boys who score low on the peer nomination measure [Feshbach & Singer, 1971, p. 91].

Thus, any manipulation that changes the peer nomination score would indeed have powerful effects, and we have demonstrated that it is this measure which is affected by television preference. While six weeks of violent television might be expected to stimulate more aggressive behaviors, it could not be expected to have the effect on the development of aggressive habits that 5-10 years of viewing violence might have.

The weight of evidence from this study when coupled with previous laboratory studies supports the theory that during a critical period in a boy's development, regular viewing and liking of violent television lead to the formation of a more aggressive life style.

SUMMARY AND CONCLUSIONS

Among the results of a large-scale survey study of aggressive behavior in third-grade school children had been the finding that children at that age who preferred violent television programs were more aggressive in school as rated by peers than children who preferred less violent programs. In a 10-year follow-up study, 427 of the original 875 subjects, including 211 males and 216 females, were interviewed as to their television habits. They again rated their peers on aggressive behavior as well as

responding to questions concerned with variables not treated extensively in the current report. It was found that the violence of programs preferred by the male subjects in Grade 3 was even more strongly related to aggression 10 years later. By the use of cross-lagged correlations, partial correlations, and multiple regression, it was demonstrated that there is a probable causative influence of watching violent television programs in early formative years on later aggression. Of course, it is not claimed that television violence is the only cause of aggressive behavior since a number of other variables are also related to aggression, including ones in addition to the more than 20 variables we have reported on here, which could conceivably have had an influence over the 10 years covered by this longitudinal design. However, the effect of television violence on aggression is relatively independent of these other factors and explains a larger portion of the variance than does any other single factor which we studied, including IQ, social status, mobility aspirations, religious practice, ethnicity, and parental disharmony.

REFERENCES

- BAILY, L. Mass media and children: A study of exposure habits and cognitive effects. *Psychological Monographs*, 1959, **73**(1, Whole No. 471).
- BAKER, R. K., & BALL, S. J. *Violence and the media*. Washington, D.C.: United States Government Printing Office, 1969.
- BANDURA, A. Influence of models' reinforcement contingencies on the acquisition of imitative responses. *Journal of Personality and Social Psychology*, 1965, **1**, 589-595.
- BANDURA, A., ROSS, D., & ROSS, S. A. Transmission of aggression through imitation of aggressive models. *Journal of Abnormal and Social Psychology*, 1961, **63**, 575-582.
- BANDURA, A., ROSS, D., & ROSS, S. A. Imitation of film mediated aggressive models. *Journal of Abnormal and Social Psychology*, 1963, **66**, 3-11. (a)
- BANDURA, A., ROSS, D., & ROSS, S. A. Vicarious reinforcement and imitative learning. *Journal of Abnormal and Social Psychology*, 1963, **67**, 601-607. (b)
- BERKOWITZ, L. Aggressive cues in aggressive behavior and hostility catharsis. *Psychological Review*, 1964, **71**, 104-122.
- BERKOWITZ, L., CORWIN, R., & HEIRONIMUS, M. Film violence and subsequent aggressive tendencies. *Public Opinion Quarterly*, 1963, **27**, 217-229.
- BERKOWITZ, L., & RAWLINGS, E. Effects of film violence on inhibition against subsequent aggression. *Journal of Abnormal and Social Psychology*, 1963, **66**, 405-412.
- CAMPBELL, D. T., & FISKE, D. W. Convergent and discriminant validation by the multitrait-multimethod matrix. *Psychological Bulletin*, 1959, **56**, 81-105.
- DARLINGTON, R. D. Multiple regression in psychological research and practice. *Psychological Bulletin*, 1968, **69**, 161-182.
- ERON, L. D. Relationship of television viewing habits and aggressive behavior in children. *Journal of Abnormal and Social Psychology*, 1963, **67**, 193-196.
- ERON, L. D., WALDER, L. O., & LEFKOWITZ, M. M. *Learning of aggression in children*. Boston: Little, Brown, 1971.
- FESHBACH, S. Aggression. In P. H. Mussen (Ed.) *Carmichael's manual of child psychology*. 3rd ed. Vol. 2. New York: Wiley, 1970.
- FESHBACH, S., & SINGER, R. D. *Television and aggression*. San Francisco: Jossey-Bass, 1971.
- GREENBERG, B. S., & GORDON, T. F. *Critics and public perceptions of violence in TV programs*. East Lansing: Michigan State University, 1970.
- HARTUP, W. W., & YONAS, A. Developmental psychology. In P. H. Mussen & M. R. Rosenzweig (Eds.), *Annual review of psychology*, 1971, **22**, 337-392.
- HEISE, D. R. Causal inference from panel data. In E. Borgatta & G. W. Bohrnstedt (Eds.), *Sociological methodology*. San Francisco: Jossey-Bass, 1970.
- HOKANSON, J. E., & EDELMAN, R. Effects of three social responses on vascular processes. *Journal of Personality and Social Psychology*, 1966, **3**, 442-447.
- KENNY, D. A. Cross-lagged and synchronous common factors in panel data. In A. Goldberger & O. D. Duncan (Eds.), *Structural equation models*. New York: Seminar Press, in press.
- ROZELLE, R. M., & CAMPBELL, D. T. More plausible rival hypotheses in the cross-lagged panel correlation technique. *Psychological Bulletin*, 1969, **71**, 74-80.
- SCHRAMM, W., LYLE, J., & PARKER, E. B. *Television in the lives of our children*. Stanford: Stanford University Press, 1961.
- WALDER, L. O., ABELSON, R. P., ERON, L. D., BANTA, T. J., & LAULICHT, J. H. Development of a peer-rating measure of aggression. *Psychological Reports*, 1961, **9**, 497-556 (*Monograph Supplement*, 4-49).
- WILLIAMS, J. F., MEYERSON, L. J., ERON, L. D., & SEMLER, I. J. Peer rated aggression and aggressive responses elicited in an experimental situation. *Child Development*, 1967, **38**, 181-190.