

## Effects of Television Violence on Memory for Violent and Nonviolent Advertising

BARRIE GUNTER<sup>1</sup>

*Department of Media and Communication  
University of Leicester  
Leicester, United Kingdom*

ADRIAN FURNHAM AND ELENI PAPPA

*University College London  
London, United Kingdom*

This study investigated the impact of television violence on memory for advertising, taking into account the possible role of viewer hostility arousal in this context. Experimental participants were exposed to advertising placed within a violent or a nonviolent film clip. One advertisement had 2 versions—violent and nonviolent—and was presented with 2 other nonviolent filler advertisements. Participants completed a mood questionnaire before and after being exposed to the television material, tested for memory for the embedded advertising and asked to rate the film clips and the advertisements using a set of evaluative scales. The nonviolent version of the target advertisement was less well remembered when placed in the violent film than in the nonviolent film, supporting Bushman and Bonacci (2002). In contrast, the violent version of the target advertisement was remembered much better than the nonviolent version when placed in the violent film sequence. Participants' hostility scores were higher only after watching the violent film, and associated with an impairment in the memory of the nonviolent advertisements, while enhancing the memory of the violent advertisement, thus providing some support for Bushman's (1998a) hostile-thought hypothesis.

Research on the effectiveness of television advertisements on consumer memory has indicated that the program in which advertisements are presented has a significant effect on the retention and comprehension of the commercial message (Furnham, Gunter, & Walsh, 1998; Norris & Colman, 1992, 1993). The nature of the surrounding program environment can affect memory for embedded advertising as a result of cognitive interference effects when program and advertising are congruent semantically (Furnham, Bergland, & Gunter, 2002; Furnham, Gunter, & Richardson, 1999) or in terms of format (Gunter, Baluch,

<sup>1</sup>Correspondence concerning this article should be addressed to Barrie Gunter, Department of Media and Communication, University of Leicester, University Road, Leicester LE1 7RT, United Kingdom. E-mail: bg45@le.ac.uk

Duffy, & Furnham, 2001); or as a function of program-induced moods (Goldberg & Gorn, 1987; Kamins, Marks & Skinner, 1991; Schumann, 1986), arousal (Mundorf, Zillman, & Drew, 1991; Pavelchak, Antil, & Munch, 1988), or excitement (Singh, Churchill, & Hitchon, 1987). While unpleasant arousal or interference can impede memory for embedded advertisements, the degree to which a program involves or appeals also can affect memory for advertising (Anderson & Bushman, 2002; Bushman & Bonacci, 2002).

However, the evidence for this type of effect is inconsistent. Highly involving programs have been found to impede memory for advertising on some occasions (Norris & Colman, 1992; Park & McLung, 1986; Thorson & Reeves, 1986), but to enhance it on others (Lloyd & Clancy, 1991). Cognitive-interference explanations have been offered for impairment effects, and priming has been invoked to explain memory-facilitation effects of surrounding program environment (Norris & Colman, 1993).

#### Context Effects of Television Violence

Recent research has indicated that violent program context can have profound effects on the cognitive processing of information from commercial messages, impairing memory for embedded advertising (Bushman, 1998a; Bushman & Bonacci, 2002; Prasad & Smith, 1994; Shen & Prinsen, 1999). Bushman (1998a) reported that viewers' memory for television advertising was impaired by the presence of adjacent violent film content, as compared with a nonviolent film environment.

This result was explained in terms of cognitive interference caused by hostility-related ideas evoked by the surrounding violent program context. It was theorized that cognitive effort becomes deflected from processing the advertising to calming the anger brought on by the adjacent program violence. This effect was attributed to the cognitive responses generated specifically by violent content, given that the violent and nonviolent film sequences used in this research had been pretested to produce nonsignificant differences in self-reported excitement and physiological arousal. Support for this hypothesis was derived from earlier research that found that mood affects memory (Bower, 1981; Burke, Heuer, & Reisberg, 1992; Mayer, McCormick, & Strong, 1995). In addition, violent programs have been known to put people in a bad mood. This mood is usually, in this specific incidence, anger (Anderson, 1997; Bushman, 1995; Bushman & Anderson, 2001; Bushman & Geen, 1990).

Disturbing program content alone has been found to impede memory for adjacent advertising (Mundorf et al., 1991). The mood-calming orientation is consistent with mood-management theory, which suggests that when people are in a bad mood, they try to repair it (Isen, 1984; Parrott, 1993; Schwarz & Clore, 1983). If the mood induced is positive, however, people try to maintain it.

By definition, though, mood repair requires far more effort than does mood maintenance. Thus, it is the actual mood-repairing effort that interferes with the attention and memory of the advertisements (Wood, Saltzberg, & Goldsamt, 1990).

The importance of the television-violence interference effect is underlined by evidence that violence is prevalent in television schedules (Gunter & Harrison, 1998; National Television Violence Study, 1998). Furthermore, while some advertisers already eschew violent programs, others do not (Hamilton, 1998). Bushman (1998a, 1998b; Bushman & Bonacci, 2002) studied the effects of a violent program context on memory for nonviolent embedded advertisements. While violent television content may induce angry thoughts (Berkowitz, 1984; Bushman, 1995; Bushman & Geen, 1990) that could, in turn, interfere with the processing of nonviolent advertising content, what impact might be expected to occur if the advertising itself contains violence? Recently, Bushman and Bonacci asked over 300 participants to watch violent, sexually explicit, or neutral television programs containing nine advertisements. Immediate and delayed recall and recognition indicated that memory was best for advertisements in neutral programs. Television violence impaired memory for participants, regardless of whether or not they liked violent programs.

Recent research has indicated that the degree of thematic congruity between advertisements and their surrounding program environment can affect memory for embedded advertising (Furnham, Bergland, et al., 2002; Furnham, Gunter, et al., 2002). However, the evidence here has been inconsistent. In one instance, thematically similar programming and advertising impaired memory for the commercial messages (Furnham, Gunter, et al., 2002), while on another occasion, thematic similarity enhanced advertising recall, provided the thematically similar program material occurred before and not after the advertising break (Furnham, Bergland, et al., 2002).

Further research has shown that although violent surrounding program content may interfere with memory for embedded advertising, the presence of violence in the advertisement may alleviate that effect. Furthermore, violent advertising may be recalled better when placed in a violent program environment than when placed in a nonviolent program environment (Gunter, Tohala, & Furnham, 2001). One explanation of this finding is that violence in the program renders violence-related constructs in the advertising more accessible (Sanbonmatsu & Fazio, 1991).

The current study extends earlier work in this area. Gunter et al.'s (2001) study followed the design of Bushman (1998a) and tested for memory of just a single advertisement embedded within a violent or nonviolent program sequence. This study used advertising breaks that contained three advertisements, and thus represented a more ecologically valid format. The design also meant that the target advertisement, which was available in a violent and a nonviolent version,

could be situated directly adjacent to the surrounding film content or set apart from it in between two filler advertisements.

Five research hypotheses were explored:

*Hypothesis 1.* Memory for advertising will be impeded when it is placed in a violent program context, as compared with a nonviolent program context, confirming previous research (Bushman, 1998a; Bushman & Bonacci, 2002; Shen & Prinsen, 1999).

*Hypothesis 2.* Memory for the nonviolent version of the target advertisement will be more seriously impeded when placed in the violent program environment than will memory for the violent version of that advertisement, consistent with Bushman (1998a).

*Hypothesis 3.* Memory for the violent version of the target advertisement will be facilitated in the violent program, as compared with the nonviolent program, confirming earlier findings (Gunter et al., 2001) and consistent with the notion of construct accessibility (Sanbonmatsu & Fazio, 1991).

*Hypothesis 4.* Hostile mood will be enhanced by watching a violent program, confirming earlier research (Bushman, 1995; Bushman & Geen, 1990).

*Hypothesis 5.* An increased hostile mood state will impair memory for advertising, as indicated by Bushman (1998a).

## Method

### *Participants*

Participants were 80 undergraduate students (40 male, 40 female) at a London university. Their ages ranged from 16 to 50 years old ( $M = 24$  years).

### *Design*

Male and female participants were assigned randomly to four treatment conditions, ensuring equal numbers of each gender per condition: Group 1—violent advertisement embedded in a violent program environment; Group 2—violent advertisement embedded in a nonviolent program environment; Group 3—nonviolent advertisement embedded in a violent program environment; and Group 4—nonviolent advertisement embedded in a nonviolent program environment. Half of the respondents in each group received the target advertisements in

the first position in the advertisement break, and half received it in the second (middle) position.

### *Materials and Apparatus*

All materials were recorded on videotape and played over a television monitor to the participants who were seated in groups of 10, approximately 10 to 15 feet (3 to 5 m) away from the screen.

*Film clips.* Clips were selected from two films: “*The Gladiator*” and “*Sleepers*.” The clip from “*The Gladiator*” was 20 min long. It depicted violent sequences featuring gladiatorial combat in a Roman amphitheatre setting in which close and brutal incidents were shown, with contestants being badly injured, mutilated, and killed. The clip from “*Sleepers*” was 22 min long and depicted meetings and conversations between the leading male characters, who plotted to gain revenge on men who had physically abused them during a period of incarceration in a young offenders’ institution. While the scenes were intense and highly emotive, they contained no acts of physical or verbal violence.

*Advertisements.* The target advertisement used in the study was for a brand of American car (Chevy S-10). This advertisement was obtained from U.S. television and, therefore, was unfamiliar to UK viewers. There were two versions of this advertisement: one violent and the other nonviolent.

In the violent version of the target advertisement, a man is depicted standing in a bar, making eye contact with a girl sitting at a table with her boyfriend. She smiles at the man, upon which her boyfriend stands up, walks to the bar, and begins beating the man up. The man fights back, and the fight spreads to others in the bar, with bottles being broken and screams heard. The boyfriend eventually throws the man out the window of what is a multistory building, and as the man falls, a male voiceover can be heard saying, “Meet Sean Graham, professional stuntman; this is how he lives.” Then the man falls on a giant inflatable mattress, which is near the Chevy S-10, and then holds up a picture of the car, with a voiceover announcing, “This is what he drives: Chevy S-10, like a rock.”

In the nonviolent version of the Chevy S-10 advertisement, the car is depicted being driven through long winding roads in the countryside, throughout the commercial. A male voiceover can be heard saying, “This is a Chevy S-10; this is what the Readers Digest think of the Chevy S-10; it’s the best buy. This is how to make a best buy even better.” Then, the price offer appears on the screen, while the car is still on the move. Soft music is heard playing in the background throughout the advertisement.

Two filler advertisements, both nonviolent, also were included in the advertisement break. These were selected from an original pool of 40 advertisements. One of these advertisements promotes a car (Citroen Xsara) and features fashion model Claudia Schiffer, initially seen walking through the streets of a city. As she

walks, the streets fill up with foam rubber and an announcer can be heard saying, "Imagine a world where everything is protected; the new look Citroen Xsara is available with six airbags." At this point, the model reaches the car, gets in, and drives it away, with the announcer saying, "Travel in a safer world." There is a soft music score in the background throughout the commercial.

The second filler advertisement promotes a television product (Philips™ Flat Screen television). In this advertisement, a couple is shown in their home, trying to find a perfect place for their television. They finish by putting it on the ceiling above their bed, with a male voiceover saying, "Flat TV from Philips; a new way to look at television." A cheerful music score plays throughout the commercial.

### *Questionnaires*

Participants were given six questionnaires to complete:

*Mood-evaluation questionnaire.* A mood-evaluation questionnaire assessed the level of anger. This questionnaire was administered twice, before and after presentation of the television material. The questionnaire consists of 15 adjectives from the hostility subscale of the Revised Multiple Affect Adjective Checklist (Zuckerman & Lubin, 1985). The adjectives were rated on a 5-point scale ranging from 1 (*not at all*) to 5 (*extremely*). Participants were instructed to "indicate the extent to which you feel this way right now." The alpha coefficient for the measure of anger was .88.

*Program rating questionnaire.* On the program rating questionnaire, participants used a 10-point scale to rate the film clip they watched on 12 evaluative scales (absorbing, hostile, arousing, disturbing, engaging, entertaining, enjoyable, exciting, happy, violent, interesting, and involving). Each scale ranged from 1 (*not at all*) to 10 (*extremely*).

*Free-recall questionnaire.* A free-recall questionnaire asked participants to write everything they could remember about the advertisements they saw. They were asked to write down the name of the product and the brand advertised, and any details of the advertising message. Such details could include specific product-related information, such as price, promotional appeals, specific strengths or benefits, presence of celebrity endorser, and other idiosyncratic features of the advertisement. The recall protocols were content-analyzed and scored against a pretested list of salient points that had been identified for each advertisement from an earlier analysis. Two independent judges conducted this assessment, and they achieved 97% agreement.

*Brand recognition questionnaire.* A brand recognition questionnaire tested memory for the brands advertised in the film clip, together with 10 distractors. Participants were asked to indicate which of the brands appeared in the break. Each correct answer was scored 1 point, while incorrect choices were given 0 points.

*Cued-recall questionnaire.* A cued-recall questionnaire presented the names of the products advertised, and three multiple-choice questions were asked about the content of each advertisement. For example, in the case of the Chevy S-10 advertisement, participants were asked to name the color of the car in the commercial, the setting in which the action took place, and details about the characters who were featured. Correct answers were given 1 point, and incorrect answers received 0 points.

*Demographics.* Finally, participants were asked for details about their age, gender, television viewing habits (average hours of viewing per day), and any prior exposure to and familiarity with the film clips or advertisements.

### *Procedure*

*Pretests.* Two film clips were selected from a sample of 10 for use in the study. Ten undergraduate students (5 male, 5 female), who did not take part in the main study, evaluated the original 10 film clips (five violent and five nonviolent) on 12 dimensions. The clips were rated on a 10-point scale ranging from 1 (*not at all*) to 10 (*extremely*). The two films selected for the study were the ones that differed principally in terms of their violence ratings, but not in terms of how entertaining and involving they were seen to be.

During film pretests, these two film clips did not differ significantly in any of the dimensions, apart from those associated with the element of violence. The films differed in hostile ratings, where the violent clip ( $M = 9.02$ ,  $SD = 0.81$ ) was judged as more hostile than the nonviolent clip ( $M = 2.23$ ,  $SD = 0.63$ ),  $F(1, 9) = 433.50$ ,  $p < .001$ . The judges considered "The Gladiator" ( $M = 8.91$ ,  $SD = 1.13$ ) significantly more disturbing than "Sleepers" ( $M = 2.74$ ,  $SD = 0.67$ ),  $F(1, 9) = 192.20$ ,  $p < .001$ . In addition, "The Gladiator" ( $M = 9.92$ ,  $SD = 0.32$ ) was judged as being significantly more violent than "Sleepers" ( $M = 1.53$ ,  $SD = 0.53$ ),  $F(1, 9) = 2,646.00$ ,  $p < .001$ .

A further group of 10 undergraduate students (5 male, 5 female), who did not participate in the main experiment, evaluated a pool of advertisements along the 12 evaluative scales used in film pretests. The two advertisements (Citroen Xsara car; Philips Flat Screen television set) that differed the least from the nonviolent version of the target advertisement (Chevy S-10) were selected for the study. Pre-test ratings showed that the four experimental advertisements did not differ on any of the 12 scales examined, apart from those associated with violence.

The violent version of the target advertisement ( $M = 5.80$ ,  $SD = 1.31$ ) was rated as being more hostile,  $F(1, 9) = 128.84$ ,  $p < .001$ , than its nonviolent version ( $M = 1.20$ ,  $SD = 0.22$ ); the Citroen Xsara ( $M = 1.30$ ,  $SD = 0.48$ ), and the Philips Flat Screen ( $M = 1.10$ ,  $SD = 0.32$ ). The violent version of the target advertisement ( $M = 2.30$ ,  $SD = 1.16$ ) was also found to be significantly more disturbing,  $F(1, 9) = 4.75$ ,  $p < .009$ , than its nonviolent version ( $M = 1.40$ ,

$SD = 0.69$ ); the Citroen Xsara ( $M = 1.40$ ,  $SD = 0.71$ ), and the Philips Flat Screen ( $M = 1.40$ ,  $SD = 0.69$ ). The advertisements differed on the element of violence as well: The violent version of the target advertisement was judged as more violent ( $M = 5.90$ ,  $SD = 0.87$ ) than the nonviolent version ( $M = 1.40$ ,  $SD = 0.52$ ),  $F(1, 9) = 186.20$ ,  $p < .001$ ; the Citroen Xsara ( $M = 1.40$ ,  $SD = 0.52$ ), and the Philips Flat Screen ( $M = 1.10$ ,  $SD = 0.32$ ).

Subsequent paired  $t$  tests on the significant dimensions show that the violent version of the target advertisement differed significantly on hostile, disturbing, and violent ratings from its nonviolent version: hostile,  $t = 16.50$ ,  $p < .001$ ; disturbing,  $t = 4.71$ ,  $p < .05$ ; violent,  $t = 20.13$ ,  $p < .001$ ; as well as different from the Citroen Xsara advertisement—hostile,  $t = 14.94$ ,  $p < .001$ ; disturbing,  $t = 4.71$ ,  $p < .05$ ; violent:  $20.13$ ,  $p < .001$ ; and from the Philips Flat Screen TV advertisement—hostile,  $t = 27.00$ ,  $p < .001$ ; disturbing,  $t = 4.17$ ,  $p < .05$ ; violent,  $36.00$ ,  $p < .001$ . All other rating differences between the three nonviolent commercials were nonsignificant.

*Main experiment.* Participants were run in groups of 10. Each group was taken into a separate room where they received the same instructions. The study was described as a film-evaluation exercise in which participants would be shown a film clip, after which they would be asked for their opinions about the clip.

Before the presentation, participants were given a mood questionnaire to complete and were told the study was also concerned with how mood affects program liking. Participants were given 3 min to complete the mood instrument. As soon as the mood questionnaires were collected, the film clip was played and participants were asked to sit back and enjoy it as if they were viewing at home. After the presentation, participants were administered further questionnaires, each of which was presented separately and only after the completion and collection of the previous one.

First, participants completed the mood questionnaire for a second time. Participants were allowed 3 min to complete this. Second, they completed the evaluative ratings questionnaire for the film clip they saw. Again, participants were allowed 3 min for this task. Third, they were tested in turn for free recall (6 min), brand recognition (2 min), and cued recall (2 min) of advertising. Finally, the personal details questionnaire was administered, for which participants were allowed 3 min. Participants were then debriefed.

## Results

### *Previous Exposure and Television Viewing Habits*

Pearson correlations revealed no significant relationships between participants' age, reported television-viewing habits, or reported prior exposure to the films or advertisements and any of the memory for advertising measures.

*Effects of Television Violence on Memory of the Advertisements*

Three 4-way ANOVAs were computed between program type, advertisement type, position of target advertisement, and gender, respectively, on free recall, brand recognition, and cued recall of the target commercial. The variables manipulated were type of film clip used (violent or nonviolent), version of the target advertisement used (violent or nonviolent), position of the target advertisement in the commercial break (first or second), and participant gender. The means are displayed in Table 1.

The ANOVAs reveal no significant main effects of film type, target advertisement position, or gender for any of the memory measures. There was a significant effect of advertisement type for free recall only,  $F(1, 79) = 5.41, p < .05$ . The violent version of the target advertisement achieved a higher mean free-recall score (3.00) than did the nonviolent version (2.27).

Only one significant interaction effect emerged between film type and advertisement type for brand recognition only,  $F(1, 79) = 9.09, p < .05$ . Here, the violent version of the target advertisement was better recognized when it had been presented within the violent film (1.00) than when it was presented within the nonviolent film (0.50), while the nonviolent version of the target advertisement was better recognized when it was presented in the nonviolent film than in the violent film (0.85 vs. 0.65).

The Film Type  $\times$  Advertisement Type interactions just failed to achieve significance with regard to the free-recall,  $F(1, 79) = 3.40, p < .07$ , and cued-recall measures,  $F(1, 79) = 3.52, p < .07$ . However, the mean scores mirror the pattern of results across conditions that were observed for brand recognition.

Six further three-way ANOVAs (Film Type  $\times$  Advertisement Position  $\times$  Gender) were conducted on memory of the other two advertisements used in this study (Citroen Xsara and Philips Flat Screen television). For the Citroen advertisement, there was a significant main effect of film type for free recall,  $F(1, 79) = 12.57, p < .001$ , where the advertisement was recalled better when presented within the nonviolent film clip than in the violent film clip (3.30 vs. 2.40); and for the brand-recognition test,  $F(1, 79) = 4.05, p < .05$ , where again it benefited from the nonviolent surrounding, as compared to the violent one (0.90 vs. 0.75). The cued-recall test just failed to reach significance for this effect,  $F(1, 79) = 3.75, p < .06$ ; but the pattern of results, as indicated by mean scores, was identical to those for the other measures (2.20 from the nonviolent film clip vs. 1.90 from the violent film clip). No other significant main or interaction effects were found.

With the Philips Flat Screen television advertisement, there was a significant main effect of film type for free recall,  $F(1, 79) = 4.48, p < .05$ , indicating that this advertisement was recalled better when presented within the nonviolent film clip than in the violent film clip (3.00 vs. 2.35); and for cued recall,  $F(1, 79) = 9.00, p < .05$ , displaying the same pattern of better recall from the nonviolent film clip

Table 1  
*Mean Free Recall, Brand Recognition, and Cued Recall of Target Advertisement*

	Violent film clip						Nonviolent film clip									
	Violent advertisement			Nonviolent advertisement			Violent advertisement			Nonviolent advertisement						
	Male	Female		Male	Female		Male	Female		Male	Female					
	1st	2nd		1st	2nd		1st	2nd		1st	2nd					
Free recall	3.81	3.40	2.40	4.00	2.42	2.21	2.40	1.43	2.82	2.41	2.20	3.02	2.81	2.61	2.60	1.82
Brand recognition	1.03	1.04	1.00	1.06	0.41	0.80	1.02	0.42	0.62	1.01	0.40	0.81	0.84	0.82	0.82	1.04
Cued recall	2.01	2.22	2.03	1.60	2.02	1.06	1.62	1.01	0.81	1.40	2.21	1.84	1.40	2.20	1.61	1.21

*Note.* Mean scores for each memory measure for the violent and nonviolent versions of the target advertisement when placed within either a violent or nonviolent film clip, in either first or second position in the advertisement break, with data further broken down by gender.

Table 2

*Mean Preexposure and Postexposure Hostility Ratings*

	Preexposure	Postexposure	<i>t</i>	<i>df</i>
Entire sample	17.32	21.92	6.86*	79
Violent film sample	17.90	25.70	7.80*	39
Nonviolent film sample	16.75	18.15	1.28	39

*Note.* Sample mean hostility scores before and after exposure to stimulus materials. *t* scores indicate where significant pretest to posttest differences occurred.

\* $p < .001$ .

than from the violent film clip (2.62 vs. 2.15). The same effects for brand recognition just failed to reach significance,  $F(1, 79) = 3.79, p < .08$ ; but the direction of the results, suggested by mean scores, was the same, with the advertisement being recognized better when it had been presented within the nonviolent film clip than in the violent one (0.75 vs. 0.55).

*Mood State and Memory for Advertisements*

Participants' mood states were measured twice, once just before and again immediately after exposure to the stimulus materials. The data were used to indicate the extent to which the violent film clip had induced a hostile mood state, and whether this mood state correlated with the memory of the advertisements, suggesting a possible indirect mediating effect of anger on memory. Scores were aggregated over this instrument to produce a single hostility score for each participant.

The preexposure hostility scores were subjected to three repeated-measures *t* tests to examine the significance of mood change. One of these analyses was computed over the entire sample, and the other two were computed separately among participants in violent and nonviolent film clip conditions. As Table 2 indicates, participants in the nonviolent film clip condition exhibited no significant shift in hostile mood from before to after film exposure, while participants in the violent film clip condition exhibited a significant increase in hostile mood, confirming the effectiveness of the film type manipulation.

Pearson zero-order correlation coefficients were computed to examine the relationship between hostility scores and the memory of the advertisements. These analyses examined relationships between mood scores and memory for the violent and nonviolent versions of the target advertisement and for the two filler advertisements. Preexposure hostile mood scores showed no significant correlations with any of the memory scores.

Postexposure hostility scores were not correlated with any free-recall scores. They were, however, significantly correlated with brand recognition of the violent version of the target advertisement within the violent film condition only ( $r = .49, p < .05$ ), suggesting that a higher postviewing hostility score was associated with better recognition of the brand from the violent version of this advertisement. This result supports the priming or construct accessibility hypothesis, with an enhanced hostility mood linked to better memory of the violent advertisement. Nevertheless, the relationship between the mood scores and the memory of the violent advertisement is not causal; thus, the exact and possible mediating effects of mood cannot be stated.

Cued recall was linked to hostility in two cases. First, a significant negative correlation was found between postexposure hostility scores and memory of the nonviolent version of the target advertisement within the violent film ( $r = -.47, p < .05$ ). These results indicate that as the hostility score increased, the memory of the nonviolent version of the target advertisement decreased. This relationship was restricted to participants in the violent film condition who, unlike those in the nonviolent film condition, experienced a previewing to postviewing increase in overall hostile mood scores.

A further significant result concerned the correlation between the postexposure mood score and cued recall of the Citroen Xsara advertisement (nonviolent) in the violent film clip only ( $r = -.37, p < .05$ ). Again, as the hostility score increased, memory for this advertisement decreased, but only when it was presented within the violent film, which induced an increased hostility mood. All other correlations were nonsignificant.

#### *Program Ratings and Target Advertisement Memory*

A series of Pearson zero-order correlations was conducted between participants' subjective film ratings and factor scores, and memory of the target advertisement, in order to examine any possible relationships. The results show no significant correlations of any individual evaluative scales or factors with any of the three memory measures: free recall, brand recognition, and cued recall.

#### Discussion

The present study investigated the effects of program environment on viewers' memory for embedded advertising. No overall effect of program environment type (violent vs. nonviolent) emerged in relation to memory for the target advertisement, aggregating over results for its violent and nonviolent versions. However, main effects of program environment type did emerge with respect to memory for the other two advertisements included in the break. In each of the latter two cases, advertisement memory was better from the nonviolent program

environment than from the violent program environment, thus partially confirming Hypothesis 1 and earlier research findings (Bushman, 1998a; Bushman & Bonacci, 2002; Prasad & Smith, 1994; Shen & Prinsen, 1999). This effect occurred for both recall and recognition measures.

With the target advertisement, there was an interaction between advertisement type (violent vs. nonviolent) and program environment type with respect to brand recognition only. Memory for the nonviolent version of this advertisement was worse when it was presented in a violent program environment than in a nonviolent program environment, supporting Hypothesis 2.

In contrast, memory for the violent version of this advertisement was better when it was presented in the violent program environment, supporting Hypothesis 3 and confirming an earlier study (Gunter et al., 2001). Although not tested, this result is consistent with the construct accessibility explanation in that violence in the adjacent program may have rendered violent attributes in the advertisement more readily accessible in memory, and in turn enhanced memory for the advertisement itself.

In further extending previous research (Bushman, 1998a; Gunter et al., 2001), the current study found that the position of the target advertisement in the advertising break had no main effect on memory for advertising content and exhibited no interaction with program environment. This finding indicates that program environment effects—whether impeding or enhancing advertisement memory—were not dependent on the target advertisement being situated immediately adjacent to violent program content.

Previous research indicated that it is not only the program environment per se that is important in relation to memory for embedded advertising, but also the subjective responses of viewers to the content of programming adjacent to advertising breaks (Norris & Colman, 1992, 1993). Subjective ratings of the surrounding program in this study were unrelated to any measures of memory for advertising.

If program violence is a particularly significant contextual feature in relation to memory for embedded advertising, how might this effect operate? Bushman (1998a) hypothesized that a violent program context could interfere with memory for embedded advertising because the violent content could generate hostile thoughts (cf. Berkowitz, 1984) that would distract viewers' attention. In particular, any effort expended by viewers on calming those hostile thoughts would reduce the cognitive capacity devoted to processing information from advertisements within the program. Therefore, memory for advertising would be impaired, as compared to a condition in which it was presented in a nonviolent program environment. According to the notion of cognitive priming and construct accessibility (Sanbonmatsu & Fazio, 1991), the presence of violence in an advertisement, however, might render it more memorable within a violent program context. This is because the constructs invoked by the program context in this case might offer informational support to constructs invoked by the advertisement.

The findings for the nonviolent version of the target advertisement as well as for the two (nonviolent) filler advertisements were partially consistent with other studies (Bushman, 1998a; Bushman & Bonacci, 2002; Bushman & Geen, 1990; Prasad & Smith, 1994). There was significant impairment of memory for nonviolent advertising when it was placed within a violent program environment. This impairment was manifest in content recall and brand-name recognition measures for the filler advertisement, though only for brand-name recognition in the case of the target advertisement. These results support the impairing effects of violent programming on memory as projected by Bushman's (Anderson & Bushman, 2002) hostile-thought interference explanation.

The pattern of results seems to conflict with the second possibility proposed by Bushman (1998a, 1998b) regarding the effects of violence on memory of the advertisements. This mood-management theory suggests that the impairment in memory results from the fact that people focus on changing the bad mood that the violent film induced, rather than focusing on the advertisements. Such a theory would predict all the advertisements presented within the violent program to be poorly recalled, regardless of their content. The fact that the violent program enhanced memory of the violent version of the target advertisement seems to contradict this hypothesis, while supporting the hostile-thought interference notion with respect to memory for nonviolent advertisements. Better memory for the violent version of the target advertisement in the violent film as compared with the nonviolent film supports Hypothesis 3, while casting some doubt on the universality of mood-management theory.

While the potential mediating or interference effects of hostile thoughts generated by surrounding program environment were not tested directly, some suggestive evidence did emerge from this study. First, in support of Hypothesis 4, the violent program did give rise to a significant increase in hostile mood scores among participants who watched this film, as compared to their mood state prior to viewing. Second, there was partial support for Hypothesis 5. Higher hostile mood scores in the postviewing test were associated with poorer recall of nonviolent advertising and with better brand recognition in the case of the violent version of the target advertisement, but in both instances only among participants in the violent program condition. Participants in the nonviolent program condition exhibited no significant change in mood state. Thus, Hypothesis 5 was confirmed with respect to nonviolent advertising, but not violent advertising, in the violent program context.

One question that might be raised with respect to the validity of this research concerns the prevalence and significance of violence as an attribute in advertising. The current study used only one violent advertisement. The significance of this advertisement was twofold, however. First, it was available in a violent and nonviolent version, meaning that for experimental purposes, it allowed more precise control over other differentiating and potentially confounding factors.

Second, the advertisement was American and was unfamiliar, in either of its two versions, to the British participants used in this study.

The study has important social and managerial implications. The possibility that advertising containing violence may have its impact on audiences enhanced when embedded in violent programming is a significant finding for broadcast regulators concerned with controlling the potential harmful effects of television output. In the United Kingdom, for instance, although violence is not a pervasive feature of traditional spot advertisements, its prevalence has increased in natural breaks in programs with respect to advance program promotions and advertisements for certain product categories, such as video games, movies, and certain types of toys. In addition, there have been high-profile cases, such as with Tango™, a soft drink. In this case, an obese, semi-clad orange-colored man was depicted leaping out at people, surprising them and slapping them hard on the cheeks. This depiction was supposed to signify the sharp taste of the drink. The campaign received many complaints from viewers with reports of children emulating this behavior, in some cases resulting in burst eardrums and other physical damage to recipients (Hanley, 2000).

Managerially, the importance of this study and others that have yielded similar results (e.g., Bushman, 1998a; Bushman & Bonacci, 2002; Shen & Prinsen, 1999) is not simply that caution is needed in the use of attributes such as violence in advertising, but perhaps more generally that the sharing of salient mood-arousing or information-related cues between advertisements and the programs in which they are embedded can affect the impact of the advertising. The scheduling of campaigns, therefore, needs to take program environments into account as well as program ratings.

In summary, the present study offers some support to earlier findings on the effects of a violent program environment on memory for embedded advertising (e.g., Bushman, 1998a; Bushman & Bonacci, 2002; Gunter et al., 2001). A surrounding program environment that contains violence was found, once again, to be likely to impede audience memory for embedded advertising. This effect can be reversed, however, when the advertising itself contains elements of violence. There is further evidence that a hostile mood state is less than optimal for remembering advertising, and that this kind of mood state can be enhanced by watching a violent television program. Future research should examine whether there are any features within advertising, other than violence, that might offset the impairment that could be caused to advertising recall of a violent program environment.

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