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Akram, Z., McClelland, A., & Furnham, A. (2018). The effect of fear-inducing content on memory for advertisements and on retroactive and proactive interference of programme information. *Applied Cognitive Psychology*, 32(4), 413-419

DOI: <http://dx.doi.org/10.1002/acp.3409>

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The effect of fear-inducing content on memory for advertisements, and on retroactive and proactive interference of programme information.

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## **Abstract**

The current study focused on whether fear-inducing content in television advertisements leads to better memory for the advertisement, but also impairs memory for programme information that either precedes the advertisements (retroactive interference) or that follows the advertisements (proactive interference). Fifty-four participants (48 female) aged 18 to 55 watched a programme that had an advertisement break in the centre. This consisted of six advertisements with either fear-inducing or non-fear inducing content. Participants were tested on their recall and recognition of the advertisement information as well as their recall of the first half and second half of the programme. The results indicated that fear-inducing advertisements were better recalled than those that elicited no fear, and there was also evidence of proactive interference from fear-inducing advertisements on programme recall. Limitations and implications of the study are discussed.

## **Introduction**

Much research has been conducted into how the use of emotion in advertising affects memory. For instance, Baird, Wahlers, and Cooper (2007) found no difference in memory for printed advertisements that were emotional, in comparison to those that were non-emotional, but both Bakalash and Riemer (2013) and Ambler, Ioannides and Rose (2000) found that advertisements that are more emotional are better remembered. On balance, the research does seem to suggest that the use of emotion in advertising improves the memorability of advertisements although this is dependent on the strength and type of emotion (Ambler & Burne, 1999; Bakalash & Riemer, 2013; Lang, Dhillon & Dong, 2009; Lee & Burns, 2014 Thorson & Page, 1988).

Research also suggests that the effect of emotional advertising on memory depends on the emotional valence of the advertisements. Bolls, Lang and Potter (2001) examined the effect of *radio* advertisements (which either contained a positive or negative emotional tone) on memory for the advertisement information. They found that advertisements which had a positive emotional tone were both better recalled, and better recognised than advertisements that had a negative emotional tone. However, a more recent study by Bradley, Angelini and Lee (2007) yielded a different pattern of results. This study used *television* advertisements, thus containing both audio and visual information. The results showed that recognition memory was better for negative advertisements than for both positive and neutral advertisements, but no difference was found between recognition memory for positive and neutral advertisements. These findings suggest that the use of negative emotional content in advertisements is effective in improving advertisement memorability relative to both positive and neutral content. These contrasting findings for radio and television advertisements suggest that the effect of emotional valence in improving advertisement memorability may be dependent on the medium in which the advertisement is presented.

One specific negative emotion that has been suggested to improve memory of advertisements is fear. Even though the use of emotion in advertising is very common, the use

of fear is relatively rare. Biener, Ji, Gilpin and Albers (2004) found that the advertisements that contained fear appeal were much better recalled than the normative advertisements that did not elicit fear. A number of other studies have also found evidence that the inclusion of fear-inducing content in advertisements seems to improve advertisement memorability (Rayner, Baxter & Ilicic, 2015; Snipes, LaTour, & Bliss, 1999).

However, some studies have indicated that eliciting fear in an advertisement can negatively impact memory for the advertisement (Brooker, 1981; Newhagen & Reeves, 1992), and it has been suggested that the effectiveness of fear in advertising is dependent on the intensity of fear that is elicited. Ray and Wilkie (1970) proposed a curvilinear model of fear, in which moderate levels of fear are most effective, whereas low levels and high levels of fear are not effective at improving advertisement memory. In support of this model, Chebat, Laroche, Badura and Filiatrault (1995) found that advertisements that elicited moderate levels of fear produced the highest recall, and that advertisements with low or high intensities of fear had similar and lower levels of recall. They suggested that the results show that the presence of fear can improve memorability of advertisements, but there seems to be a threshold beyond which memorability begins to decrease. In a recent review of the use of fear in advertising (Williams, 2012) supported the idea of a curvilinear relationship between fear and recall, with moderate levels of fear being most effective.

A recent study that investigated the effect of differing levels of fear intensity on advertisement recall seemed to yield a different pattern of results. Rayner, Baxter and Ilicic (2015) exposed participants to advertising messages about smoking, some of the which depicted high levels of harm, whereas others depicted low levels of harm. The results showed that advertisements that depicted high levels of harm were better recalled than those that depicted low levels of harm. These findings suggest that eliciting high levels of fear more effectively improves advertisement memorability than eliciting low levels of fear.

## **Retroactive and proactive interference**

Another area of interest is how experiencing fear may influence people's memory of information that is seen before or after the fear experience. There is some evidence to suggest that being exposed to negative videos, such as those that elicit fear, can cause retroactive interference. Retroactive interference occurs when the memory for something that was previously learned is impaired as a result of learning something new (Postman, 1961). Strange, Hurlemann and Dolan (2003) investigated how exposure to negative emotional stimuli affected memory for information that preceded the negative stimulus. The results showed that words that elicited negative emotion were better recalled than neutral words, suggesting that negative stimuli are better recalled. It was also found that words that were seen before the negative stimuli were worse recalled, suggesting an emotion-induced memory impairment. The findings of this study suggest that exposure to negative stimuli can cause retroactive interference. Studies that have used videos of negative news stories and looked at their effect on memory (e.g., Lang, Newhagen & Reeves, 1996; Newhagen & Reeves, 1992) have also found that exposure to emotionally negative stimuli results in retroactive interference. Applying these findings to the use of fear in advertising suggests that eliciting fear in advertisements could cause impairments in memory for information seen before the onset of the fear-inducing advertisement.

There is also some evidence to suggest that being exposed to negative stimuli can lead to proactive interference. Proactive interference is an impairment in the ability to learn new information because of information that was learned previously (Postman, 1961). A study by Mundorf, Drew, Zillmann, and Weaver (1990) investigated the effect of negative news stories on memory for subsequent information. The results showed that memory for information following the negative news stories was poorer than memory for information that followed neutral news stories. The findings of this experiment suggest that exposure to negative stimuli

can cause proactive interference and similar results have been found in other studies (e.g., Erk, Kiefer, Grothe, Wunderlich, Spitzer & Walter, 2003; Gunter, 1979; Gunter, Berry & Clifford, 1981). However, there is some evidence to suggest that exposure to negative stimuli can lead to proactive *facilitation* of memory. Proactive facilitation is an improvement in ability to learn new information because of information that was learned previously (Cermak, 1970). Newhagen (1998) found that memory of news stories was improved after participants had seen negative stimuli, which suggests that exposure to negative stimuli can improve memory for subsequent information.

The aim of the current study was to look at the effect of fear-inducing content in advertisements on memory for the advertisements, and also to investigate if the presence of fear-inducing advertisements impaired memory for information preceding the advertisements (retroactive interference) or information that follows the advertisements (proactive interference). The following hypotheses were tested:

- 1) Recall of advertisement information will be better for advertisements with fear-inducing content relative to advertisements without fear-inducing content.
- 2) Recognition of advertisement information will be better for advertisements with fear-inducing content relative to advertisements without fear-inducing content.
- 3) Memory for programme information preceding fear-inducing advertisements will be worse than memory for information that preceding advertisements without fear-inducing content.
- 4) Memory for programme information that follows fear-inducing advertisements will be worse than memory for information that follows advertisements without fear-inducing content.

## **Method**

### **Participants**

Fifty-four participants took part in study, of which 48 were female. The participants were 18 to 55 years old ( $M = 19.96$  years,  $SD = 5.19$  years) and were recruited from the Psychology and Language Sciences (PALS) Subject Pool at University College London.

## **Design**

The present study employed a between-subjects design. The independent variable was the presence/absence of fear-inducing content in the advertisements, for which there were two conditions: the ‘fear’ condition and the ‘non-fear’ condition. Participants were randomly assigned to one of the two conditions (27 in each condition). There were four dependent variables in the study: 1) recall of advertisement information, 2) recognition of advertisement information, 3) memory for information in the first-half of the programme, and 4) memory information in the second-half of the programme.

## **Materials**

### *Programme and advertisements*

The programme used in the study was an episode from the series, *Border Security: America’s Front Line*. The episode was 21 minutes and 28 seconds long, excluding the advertisement break in the middle of the programme. Two different compilations of six advertisements were created to be placed in the central advertising break: fearful advertisements (length: 2 minutes, 50 seconds) and non-fearful advertisements (length: 2 minutes, 41 seconds). The centre advertising break was placed 12 minutes and 30 seconds into the programme.

The advertisements were selected based on ratings taken from a sample of 24 participants (also recruited from the PALS Subject Pool). They rated 20 advertisements on a scale from 0-100 (ranging from ‘not scary at all’ to ‘very scary’). The advertisements chosen for the fear condition were those six that were rated as being ‘moderately scary’ on the scale (since previous research had shown that moderate levels of fear intensity are most effective).

The six advertisements for the non-fear condition were those that were rated closest to being 'not scary at all'. The 'fearful' advertisements consisted of those for: Audi (car), Remco (baby doll), PlayStation (games console), McDonalds (ice cream sundae), K-fee (caffeinated energy drink) and Phones4u (Samsung mobile phone). Four of the 'fearful' advertisements contained jump scares, i.e., moments that catch people by surprise and cause them to 'jump'. The remaining two 'fearful' advertisements portray children's dolls in an eerie manner. The 'non-fearful' advertisements consisted of those for: Audi (car), Mattel (baby doll), PlayStation (games console), McDonalds (burger), Sting (energy drink), Phones4u (BlackBerry mobile phone).

### *Questionnaires*

Participants were given six different questionnaires to complete to assess their memory for the advertisements and the programme. Participants were given the following tests:

- (1) Free recall of advertisements: Participants were asked to try to recall all the information they could from the advertisements. This included brand names, the products being advertised, the advertising message and any other details they could remember.
- (2) Cued recall of advertisements: For each of the six advertisements, participants were asked two multiple choice questions, one about the products, and the other about the general content of the advertisements.
- (3) Recognition of brand logos: Participants were presented with 20 company logos and were asked to identify the six brand logos that they had seen in the advertisements.
- (4) Recognition of products: Participants were presented with the names of 20 products and were asked to identify the six products that they had seen in the advertisements.
- (5) Recall of programme first half: Participants were asked seven questions which related to content seen in the first half of the programme.

(6) Recall of programme second half: Participants were asked seven questions which related to content seen in the second half of the programme.

Free recall of advertisement information in both conditions was scored out of 24. These scores were based on a list of the most notable features seen in the advertisements, which were chosen in advance of the study for the six advertisements in each condition. For the recognition tests (brand and product recognition), one mark was awarded for each correct response. In the cued recall test, participants gained one mark for each multiple choice question correctly answered. The first-half and second-half programme questionnaires were scored by awarding one mark for each correct response. To check for the reliability of the scoring, an independent judge was recruited who marked a set of the questionnaires. A high level of agreement (93%) was found between the scores awarded by the judge and the first author. Free recall and cued recall scores for the advertisements were summed for each participant to give an overall score for advertisement recall. Similarly, brand recognition and product recognition scores were also summed to give an overall score for advertisement recognition memory.

## **Procedure**

Ethical approval for the study was granted to the third author. The experiment was conducted using the online survey platform Qualtrics ([www.qualtrics.com](http://www.qualtrics.com), Qualtrics, Utah, USA), and was live between 26<sup>th</sup> November and 20<sup>th</sup> December 2016. Participants completed the experiment in their own environments but were clearly instructed to choose a quiet room with no distraction. Before the experiment began, participants were asked to answer a number of demographic questions. They then watched the first half of the programme, and were then presented with the advertisement break in which they saw six advertisements. All six advertisements either contained fear-inducing stimuli ('fear' condition) or non-fear-inducing stimuli ('non-fear' condition). After the advertisement break, participants watched the second

half of the programme. Once the programme had finished, they were asked to complete the memory questionnaires, and were then provided with de-briefing information regarding the aims of the study.

## Results

Four scores were computed for each participant: an advertisement recall score, an advertisement recognition score, a recall score for the first-half of the programme, and a recall score for the second-half of the programme. The means and standard deviations for these measures under the two advertisement content conditions are presented in Table 1.

Insert Table 1 about here

A one-way MANOVA was conducted with advertisement content (fear vs. no-fear) as the independent variable and with the four recall measures as the dependent variables. Using Pillai's trace as the test statistic, there was a significant effect of advertisement content on recall,  $V = 0.20$ ,  $F(4, 49) = 2.97$ ,  $p = .028$ ,  $\eta_p^2 = .20$ . Univariate ANOVAs were then conducted for each of the four memory measures. There was no significant effect of advertisement content on advertisement recall,  $F(1, 52) = 1.16$ ,  $p = .29$ ,  $\eta_p^2 = .02$ , nor was there an effect on advertisement recognition,  $F(1, 52) = 1.09$ ,  $p = .30$ ,  $\eta_p^2 = .02$ . With respect to the effect of advertisement content on programme recall, there was no significant effect on the recall of the first-half of the programme,  $F(1, 52) = 2.48$ ,  $p = .12$ ,  $\eta_p^2 = .05$ , but as predicted, recall of information in the second-half of the programme was adversely affected by the presence of fear-inducing content in the advertisements,  $F(1, 52) = 4.84$ ,  $p = .032$ ,  $\eta_p^2 = .09$ . However, inspection of Table 2 reveals that there were a number of significant correlations between the dependent measures.

Insert Table 2 about here

In particular, there were moderate correlations between the two measures of memory for the advertisements, and somewhat stronger correlations between the measures of memory for the first and second halves of the programme. There was also a significant correlation between recall memory for the advertisements and programme content memory for the second-half of the programme. There have been a number of suggestions as to how to proceed when the dependent variables included in a MANOVA are correlated (e.g., Koslowsky & Caspy, 1991; Tabachnick & Fidell, 2001) all involving some form of step-down analysis of variance. In particular, Koslowsky and Caspy suggested employing the procedure in several sequences in order to identify sources of unique variance. Given the pattern of results in Table 2, we decided to use the variables with significant correlations as covariates in a step-down analysis to provide more sensitive tests of the hypotheses. For all ANCOVAs, advertisement content (fear vs. no-fear) was the IV. In the first ANCOVA, advertisement recall was the DV, and advertisement recognition and second-half programme recall were used as covariates. Both covariates were significant; recognition,  $F(1, 50) = 12.71, p = .001, \eta_p^2 = .20$ , and second-half programme recall,  $F(1, 50) = 6.90, p = .011, \eta_p^2 = .12$ . Critically, there was also a significant effect of advertising content,  $F(1, 50) = 6.08, p = .017, \eta_p^2 = .11$ . Recall for the advertisements with fear-inducing content ( $M_{Adj} = 17.72$ ) was higher than for advertisements without fear-inducing content ( $M_{Adj} = 14.46$ ), thus supporting the first hypothesis. In the second ANCOVA, advertisement recognition was the DV, and advertisement recall the covariate. Advertising recall was significant,  $F(1, 51) = 13.42, p = .001, \eta_p^2 = .21$ , but Advertising content was not,  $F(1, 51) = 2.86, p = .10, \eta_p^2 = .05$ . Recognition performance for fear-inducing advertisements ( $M_{Adj} = 8.44$ ) was lower than for advertisements without fear-inducing content ( $M_{Adj} = 9.15$ ) – but not significantly so. In the third ANCOVA, first-half of the programme recall was the DV and second-half of the programme recall was the covariate. The covariate was significant,  $F(1,$

51) = 26.82,  $p < .001$ ,  $\eta_p^2 = .35$ , but advertisement content was not significant,  $F < 1$ , and recall performance under the two content conditions was virtually identical (Fear:  $M_{Adj} = 4.99$ , No-fear:  $M_{Adj} = 5.11$ ). In the final ANCOVA, second-half of the programme recall was the DV, and first-half of the programme recall, and advertisement recall were covariates. Both covariates were significant; first half of the programme recall,  $F(1, 50) = 23.54$ ,  $p < .001$ ,  $\eta_p^2 = .32$ , and advertisement recall,  $F(1, 50) = 5.23$ ,  $p = .027$ ,  $\eta_p^2 = .10$ . Advertising content was significant,  $F(1, 50) = 3.95$ ,  $p = .026$  (one-sided), with programme recall following a fear-inducing advertisement ( $M_{Adj} = 4.90$ ) being lower than recall following an advertisement without fear-inducing content ( $M_{Adj} = 5.58$ ), again supporting the fourth hypothesis.

## **Discussion**

The present study aimed to investigate the effect of fear-inducing content in advertisements on memory for the advertisements, and also to investigate if fear-inducing content impairs memory for information that precedes the advertisements (retroactive interference) or information that follows the advertisements (proactive interference). The results of this experiment indicate that recall (but not recognition) of advertisements is better when they contain moderate fear-inducing content. We suspect that the failure to find an effect of advertisement content on recognition memory was due to a ceiling effect in this measure. There was no evidence to suggest that fear-inducing advertise retroactively interfered with memory for information in the first-half of the programme, but there was evidence for proactive interference of programme recall.

Previous research has shown that the effectiveness of fear in advertising on memory is dependent on the intensity of fear that is elicited (Chebat, Laroche, Badura, & Filiatrault, 1995; Fischer, Cohen, Schlesinger & Bloomer, 1967; Ray & Wilkie, 1970). Moderate levels of fear were found to be effective in increasing the memorability of advertisements, whereas

low and high levels of fear led to poorer memory for the content of the advertisements. The results from this study again suggest that eliciting a moderate amount of fear in participants does lead to better memory as indexed by advertisement recall.

The third hypothesis of the current study was that memory of information that preceded fear-inducing advertisements would be worse than memory for information that preceded advertisements that did not induce fear. The results do not support this hypothesis. There was no difference in recall of the first-half programme between the fear and no-fear conditions, suggesting that the use of fear in advertisements does not cause the memory of something that was learned previously to be impaired (retroactive interference).

A potential reason why evidence of retroactive interference was not found may be because of the length of the programme that was used in this experiment. In previous studies where evidence of retroactive interference was found (e.g., Lang, Newhagen & Reeves, 1996; Newhagen & Reeves, 1992), news stories were seen by the participants before exposure to the fearful stimuli. In both of these studies, the news stories were between two and a half, and three and a half minutes long, which is considerably shorter than the first half of the programme in the current experiment, which was 12 minutes and 30 seconds long. It may be that retroactive interference caused by fearful advertisements can occur, but that it is time-sensitive, and may only occur for information that immediately precedes the exposure to the fearful stimuli. The final hypothesis was that memory for information that followed fear-inducing advertisements would be worse than memory for information that followed advertisements that did not have fear-inducing content. This hypothesis was supported in the current study. The results show that recall of the information within the second-half programme was lower in the fear condition than in the non-fear condition. This finding suggests that the use of fear-inducing content in advertisements leads to an impairment in the ability to learn information following the advertisement.

The findings of this study are consistent with previous research, which has shown that the use of fear in advertising is effective in improving memorability of the advertisements (Biener, Ji, Gilpin & Albers, 2004; Fischer, Cohen, Schlesinger & Bloomer, 1967; Janis & Feshbach, 1953; Rayner, Baxter & Ilicic, 2015; Snipes, LaTour, & Bliss, 1999), and with the finding that eliciting moderate levels of fear in advertising seems to be most effective in improving memory for advertisement content (Fischer, Cohen, Schlesinger & Bloomer, 1967; Chebat, Laroche, Badura, & Filiatrault, 1995). However, some previous research also suggested that eliciting fear in advertisements leads to an impairment in memory of advertisement information (Brooker, 1981; Newhagen & Reeves, 1992), but these findings are not supported by the current study.

In addition, whereas previous research suggested that exposure to negative video content, such as fearful stimuli, results in retroactive interference (Lang, Newhagen & Reeves, 1996; Newhagen & Reeves, 1992; Strange, Hurlmann & Dolan, 2003), the current study does not support this finding. In this experiment, no evidence of retroactive interference was seen as levels of recall for information in the first-half of the programme were similar in the fear and no-fear conditions. However, the findings of this experiment are consistent with previous research showing that exposure to stimuli that elicit fear can cause proactive interference (Erk, Kiefer, Grothe, Wunderlich, Spitzer & Walter, 2003). Memory for information in the second-half of the programme was worse following fear-inducing advertisements in comparison to advertisements that did not induce fear. This finding suggests that exposure to fear in advertisements causes an impairment in ability to learn new information, as opposed to improving the ability to learn new information as suggested by Newhagen (1998).

### **Limitations and future research**

A limitation of the present study is that the conditions under which it was completed may not closely reproduce the way in which programmes and advertisements are viewed in reality. In this experiment, participants were presented with consecutive advertisements and they did not have the choice to skip any of them, whereas in reality, people can choose not to watch advertisements by changing the channel or by simply not paying attention. Thus although the use of fear was found to enhance advertisement memorability, it is possible that upon seeing the beginning of a fear-inducing advertisement, some individuals may change the channel, or not pay attention, because they find the content aversive. For this reason, caution must be taken when directly applying these results in advertising and marketing. It may be useful in future research to ask participants once they have completed the experiment, whether they would have continued watching advertisements containing fear-inducing content in a 'real-world' setting.

In addition, the present study looked specifically at the effect of inducing a moderate level of fear relative to no fear on memory for video advertisements, but to test Ray and Wilkie's (1970) hypothesis that there is a curvilinear relationship between level of fear and memory performance more rigorously, a condition in which the advertisements induce a high level of fear should be included (but see the brief discussion of the use of fear-induction- in advertisements below).

Finally, the sample in this study was 89% female, and it is possible that males and females respond differently to fear-inducing advertisements. There is evidence to suggest that women exhibit more negative expressions in response to fear than men (Kring & Gordon, 1998) and that women report experiencing significantly higher levels of fear than men (Carey, Dusek & Spector, 1988; Dillon, Wolf & Katz, 1985; Gallacher & Klieger, 1995; Katkin & Hoffman, 1976; McLean & Anderson, 2009). However, self-reports may be affected by social desirability, as men may not report their true levels of experienced fear because they believe that men should appear stronger and more fearless than women. In addition, some studies have

shown that although women report experiencing higher levels of fear than men in response to certain stimuli, there is no significant difference in their skin conductance response (SCR) (Katkin & Hoffman, 1976; Thunberg & Dimberg, 2000). Nevertheless, if women do indeed experience higher levels of fear than men, this may explain why fear-inducing advertisements were found to be significantly better recalled and why proactive interference was seen, since the sample was predominately female. Further research is needed to investigate whether the current results are gender-specific, or whether the same result are evident with a male sample.

## **Implications**

The findings of this experiment have implications in the use of fear in advertising. This study suggests that eliciting moderate fear in advertising does improve memory for the advertisement when compared to an advertisement that does not contain fear-inducing material. Since it is costly to both produce and air an advertisement on television, it is important to know whether the advertising approach being used will be effective. The current study suggests that the use of moderate fear in advertising may be a reasonable strategy, but clearly further research is required. There is evidence that the use of humour (Furnham, Gunter & Walsh, 1998) and sexual imagery (King, McClelland & Furnham, 2015) improves memory for advertisements, and the present findings suggest that eliciting moderate fear can also improve advertisement memorability. Ethical questions have been raised with respect to the use of sexual imagery and violence in advertising (e.g., Boddewyn, 1991) and this is also true for the use of fear. However, the majority of research has focused on the use of fear to change behaviour rather than to market specific products/brands. Thus the literature addresses the ethicality of using fear messages, such as fear of death in drink-driving or smoking advertisements, but there are examples such as fear of the social rejection portrayed in some advertisements for products such as deodorants

(Arthur & Quester, 2003). However, there does not appear to be any research specifically addressing the ethicality of using jump-scares in advertisements. There is research to suggest that the level of fear elicited is important, with advertisements containing moderate levels of fear arousal being more persuasive than those with low of fear arousal (Krisher, Darley & Darley, 1973). There is less consistency with respect to advertisements with very strong fear appeal which may induce high levels of tension/anxiety within participants suggesting that the use of advertisements with high levels of fear appeal may be unethical. However, LaTour, Snipes and Bliss (1996) found no difference in perceived ethicality between a 'mild' versus a 'strong' fear appeal in a video advertisement for a stun-gun. In conclusion, the present findings suggest that a moderate level of fear-induction, which is unlikely to be seen as unethical, does leads to better retention of the advertisement, but also results in proactive interference for programme material.

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Table 1

*Memory performance as a function of advertisement content*

Memory measure	Advertisement content			
	Fear-inducing		Not fear-inducing	
	<i>M</i>	<i>SD</i>	<i>M</i>	<i>SD</i>
Advertisement				
Recall	15.30	4.88	16.89	5.91
Recognition	9.04	1.53	8.56	1.84
Programme				
First-half recall	5.41	1.57	4.70	1.70
Second-half recall	5.70	1.35	4.78	1.71

Table 2

*Intercorrelations between the memory measures*

Measure	1	2	3	4
1. Advertising recall	--			
2. Advertising recognition	.426**	--		
3. Programme first-half recall	.154	.064	--	
4. Programme second-half recall	.295*	.143	.611**	--

\* $p < .05$ , \*\* $p < .01$