

Sex Does Not Sell: Effects of Sexual Advertising Parameters on Women Viewers' Implicit and Explicit Recall of Ads and Brands

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Abstract

This study investigated implicit and explicit memory effects of sexual and non-sexual advertisements embedded in either a sexual or non-sexual program among women viewers. We predicted that sexual appeals would facilitate implicit memory for the brand, and we explored whether program-type (sexual or non-sexual) and its associated congruity would impact or moderate recall of the surrounding advertisement among a small sample ($n = 52$) of exclusively women advertisement viewers. Sexual (versus non-sexual) advertising led to significantly worse implicit memory for the brand logo but better explicit recall for the advertisement scene itself. There was no effect of sexual appeals on explicit brand name recall, and no significant effect on advertisement recall of the program type. There was a significant interaction effect for program type and advertisement type for explicit recall of the advertisement scene, in which program-type moderated sexual advertisement recall. These results suggest that sexual advertising may increase memory for the advertisement at the

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expense of recalling the brand advertised. Limitations and implications of this study are discussed.

Keywords

sexual appeals, advertisement, implicit memory, explicit memory, brand

Introduction

In the context of many advertisements competing for consumers' attention, advertisers have attempted various persuasion techniques to make their ads more memorable, including the use of sexual appeals. Wirtz et al. (2018) defined a sexual appeal as a "persuasion attempt that uses words, images and/or actions by models to evoke sexual thoughts feelings and/or arousal in a target audience" (p.169). Several factors have been considered as explanations for the presumed efficacy of sexual appeals. Among these is that sexual appeals create positive feelings in the viewer that, in turn, create positive brand attitudes and increased sales (Endres & Hug, 2004). This process of encouraging favorable consumer attitudes (Reichert et al., 2011) and strong emotional responses (Digout & Tayeh, 2015; Furnham & Hiranandani, 2009; Huber & Lindgren, 2018) has been supported by a research finding that sexual advertisements induce psycho-physiological reactions, including an increased galvanic skin response (Belch et al., 1982). However, the experimental evidence based on explicit memory studies of television advertisements on whether "sex sells" is contradictory: some research has found it enhances memory for the product and intention to buy while other research has shown it has no effect (Parker & Furnham, 2007; King et al., 2015). In this study we revisit the question using implicit and explicit memory measures and novel stimulus materials.

Sexual Appeals and Advertisement Memory

If sexual appeals increase a viewer's recall of an advertisement, this may, in turn, increase target brand purchase intentions (Gunter, 2000; Hall, 2002). Several authors have offered theories regarding the role of ad memory in purchase intentions. Lang (2000) proposed the *limited capacity model* which argues that when a person decides to pay attention to an interesting stimulus (i.e., television advertisement), they must allocate cognitive resources to information processing. When they are cued automatically, and paying attention, the process of allocating cognitive resources begins to elicit message processing. This information is then stored and if it is useful, it will move to short-term memory and then long-term memory. The model suggests the encoding, storage and retrieval of information means that certain cognitive resources are required for a particular

task. These are inevitably limited by certain factors and may not always be fully available to successfully complete the task. This has been extended to *Limited Capacity Model of Motivated Mediated Message Processing* (Fisher et al., 2018) which may explain why the motivation to attend to taboo, but captivating, sexual messages is so demanding. In this context, sexual advertising may demand more cognitive resources than non-sexual advertising; increased cognitive resources devoted to the ad's sexual content may then create greater memory storage capacity. Some research has supported the *limited capacity model* by showing that sexual appeals increase memory for the advertisement scene (Du Plessis, 2005).

Other relevant theories include *perceptual fluency* theory, which suggests that prior exposure to advertisements and their brands should lead to facilitated recognition and more favorable attitudes (Winkielman & Cacioppo, 2001). An evolutionary perspective on cognitive capacity is evident in the *evolutionary emotional arousal theory* (Lull & Bushman, 2015) stating that cognitive overload caused by sexual content should lead to poorer recall of all details that do not contain sexual content. This is because individuals have an evolutionary predisposition to attend to evolutionarily significant cues - including violence and sex. The latter theory suggests that there may be a sex difference in this regard with males being more sex stimuli sensitive than females.

In a study using a recognition memory paradigm, sexual appeals, compared to non-sexual ads, increased visual recognition of the advertisement but did not impact brand memory (Lachance et al., 1977). Other advertising studies have relied on a free recall paradigm rather than recognition memory. Although Parker and Furnham (2007) found no effect of the type of advertisement (sexual vs. non-sexual) on the free recall of advertisement content or brand, Furnham and Mainaud (2011) found that sexual advertisements were better recalled than non-sexual advertisements and this was true when they were embedded in programs with either sexual or non-sexual content. Possible explanations for the different findings are the nature of the ads and that other factors, like humor, are not controlled (leading us to make an effort to do so in this study).

Overall, the literature on this topic has suggested that sexual advertising leads to superior recall of the advertisement (King et al., 2015; Leka et al., 2013; Toverljani et al., 2017; Wirtz et al., 2018), but it has been less clear whether sexual appeals improve brand memory and/or increase consumers' brand purchase intentions (Black & Morton, 2017; Vezych et al., 2017; Wirtz et al., 2018). While several studies have offered evidence that sexual appeals increase memory for both advertisements and brands (e.g., Ferguson et al., 2010), a recent meta-analytic review concluded that sexual appeals improved memory for the advertisement scene but did not impact brand memory (Wirtz et al., 2018). In fact, in some cases, brands featured in advertisements using sexual appeals were less well recognized and accurately or frequently recalled than brands that did not

use sexual appeals (Bushman, 2007; Parker & Furnham, 2007; Reichert & Alvaro, 2001). One explanation for this divided effect of sexual appeals, arguing in opposition to the *limited capacity model*, has been that the increased cognitive load associated with sexual appeals diminishes available cognitive resources for encoding the brand (Fried & Johanson, 2008). Lull and Bushman (2015) found that the stronger the sexual content in an advertisement, the worse the brand memory. Further, since Reichert et al. (2001) suggested that brand memory is more strongly correlated with purchase intentions than advertisement memory, there are negative implications for the impact of sexual appeals on purchase intentions. However, advertisers continue to promote advertisements with strong sexual appeals despite mixed and contradictory evidence regarding their efficacy (Amyx & Amyx, 2011), perhaps because these ads sell well to those purchasing advertisements.

Several paradigms have been used in past studies of implicit memory for advertisements, but no research to date has used an implicit memory paradigm to investigate the impact of sexual appeals on recall of both ads and brand name. Implicit memory has been defined as a behavioral change in some task performance due to a prior exposure period, but for which there is no deliberate recollection (Schacter, 1987). Thus, implicit memory paradigms are able to measure whether or how much an ad influences consumer behaviors (and, by implication, consumer attitudes) without the consumer's conscious awareness (Northup & Mulligan, 2014). Shapiro and Krishnan (2001) suggested that implicit memory is more sensitive than explicit memory for measuring advertisement memory, and implicit memory appears to remain stable across conditions, including delays between ad viewing and brand purchases and poor attention to the ad. Lee (2002) used a word-fragment task to measure implicit memory for brand names and suggested that implicit memory measures were a better indicator of advertisement effectiveness than explicit memory measures. Lee's study used a brand-name fragment completion task and was thus only able to investigate verbal implicit brand memory; and she did not investigate implicit memory for brand logos that may be influential when consumers are making brand choices. Brand logos are a key identifying feature for a brand (van Grinsven & Das, 2016), and they are an important retrieval cue (Bottomley & Doyle, 2006). Visual stimuli are also more easily recognized than words (Edell & Staelin, 1983), and brand logos are a key element of a consumer's visual attention (Wedel & Pieters, 2000).

Hervet et al. (2011) used an implicit memory test adapted from Petre (2005) to investigate whether visual tracking of static advertisements led to increased implicit memory. Participants were previously exposed to internet banner advertisements, and these stimuli were then degraded and re-presented to the participants. These researchers found that memory for the advertisements was related to exposure, demonstrating visual implicit memory for the advertisements, though not for the brand logo itself.

Contextual Program Effects

Advertisements are rarely presented in a standalone fashion; they are most frequently embedded within a certain media program. Some studies have suggested that programs containing sexual content impair memory for surrounding advertisements (Bushman, 2005; Bushman & Phillips, 2001). Bushman and Bonacci (2002) offered several explanations for this effect. In their first explanation, derived from the theory of *limited cognitive capacity* (Lang et al., 1996), Bushman and Bonacci (2002) proposed that high levels of attention for sexual program content lead to high levels of encoding and cognitive overloading for details of the program, which, in turn, leaves less cognitive capacity for processing the advertisements, disrupting advertisement recall. A second explanation drew from Berkowitz's (1984) *cognitive neo-association theory* suggesting that sexual program content distracts the consumer with sexual thoughts that, in turn, detract from processing the advertisements. Overall, small and subtle differences in research designs, procedures and stimuli used have led to mixed results and conclusions as to whether program content influences advertisement recall. Hence, in the current study, we used a new, more implicit memory measurement and explored the contextual effects of a media program contiguous to the advertisements.

Program-Advertisement Congruity

Theories of limited cognitive capacity suggest that a prioritization of processing sexual content occurs at the expense of non-sexual content (Lang, 2000). Program-advertisement congruity occurs when sexual content appears in both the program and the advertisement, or it appears in neither the program nor the advertisement. As cognitive resources are limited, there may be an interaction between program-type (sexual or non-sexual) and advertisement-type (sexual or non-sexual), in which a program with sexual content can moderate memory for a contiguous advertisement with sexual content.

Here too, past research has shown mixed results. While some studies have found that congruity between a program and its advertisements enhanced advertisement recall (Furnham et al., 2002; Sharma, 2000), others have not replicated that result. Bushman (2007) found that sexual advertisements were not remembered better when associated with a sexual program. Rather, sexual program content hindered sexual advertisement recall. De Pelsmacker et al. (2002) found that congruity between advertisements and programs negatively impacted memory. Overall, while semantic similarity between programs and advertisements has been proposed as a moderator of memory for advertisements, evidence has not yet clearly established whether semantic similarity enhances or hinders advertisement memory (Lull & Bushman, 2015; Wirtz et al., 2018).

The Current Study

In this study, we used measures of both implicit and explicit memory, and we aimed first to determine whether there would be a difference between a sexual and a non-sexual program type on advertisement memory and second to determine whether program-advertisement congruity would moderate memory for sexual advertisements. Based on the foregoing prior research, we sought to test three hypotheses:

H1. Using explicit memory measures, sexual advertising will lead to greater advertisement scene recall, but will not affect brand name recall, because sexual content in the advertisement scene will be encoded at the expense of the brand information.

H2. Using newer implicit memory measures, sexual advertising will lead to greater implicit brand logo memory than non-sexual advertising, because consumers may be unaware of ways in which this advertisement exposure affects implicit recall, and implicit memory measures are apt to be more sensitive to these effects.

H3. Despite contradictory findings in the literature, an incongruity effect will be evidenced by sexual advertisements being better recalled in a non-sexual program.

Method

Participants

We recruited 53 participants from an online participant database. Participants were rewarded using course credits. We conducted a power analysis using G*Power (Faul et al., 2007) that suggested a need for a sample size of 52 participants to detect a moderate effect ($d=0.5$) with 80% power at $p < .05$. All participants were female, and their age ranged from 18-57 ($M=19.64$, $SD=5.44$). The decision to include only female participants was taken in order to achieve homogeneity in the convenience sample, as the majority of psychology students at UCL are female. Their self-described ethnicities were Chinese (41.51%), Other White (24.53%), White British (11.32%), Indian (5.66%), White and Asian (5.66%), Other Asian (3.77%), White and Black Caribbean (3.77%) and Other Mixed (3.77%). The study was approved by the UCL Department of Experimental Psychology Ethics Committee (CEHP/2017/514). All participants gave their informed consent prior to participating in this research.

Materials and Apparatus

The study was conducted on Microsoft Computers in individual cubicles. The study was created and hosted on Gorilla software (Anwyl-Irvine et al., 2019).

Advertisements and Product Logos

We used a pilot study to ascertain which advertisements to include in the main study. For the pilot study, there were eight consenting volunteers (4 females and 4 males) whose ages ranged from 18-22 ($M=20.40$, $SD=1.07$). We tested 24 advertisements, initially chosen because they had been broadcast primarily in America and Australia and not in the United Kingdom, reducing the likelihood that our participants would have had prior exposure to them. Each advertisement was in a 30-second format (+/- 2seconds). We used a participant-completed scale from Lull and Bushman (2015) to measure the level of sexual-content in advertisements. On the basis of these eight participants' ratings, the sexual advertisements we retained for the current study fulfilled the second level of the scale, requiring that the sexual appeals contain 'revealing clothes' and 'suggestive content.' Advertisements that did not fulfil any level on the scale were deemed non-sexual. Five different advertisements were chosen from each of four different product category types (Fast food, fragrance, hair-care and jeans). We chose products whose brand logos were visually similar across categories.

All pilot participants reported not having seen any of the advertisements previously. They answered scale questions about sexual content, humor and interest on a 5-point Likert items (1: Not at all to 5: Very). We calculated a mean score for each advertisement, and selected the most sexual and least sexual advertisement within each product category, controlling for humorous content and level of interest. The four sexual advertisements were for these brands: Carls Jr., Dolce & Gabbana, Aussie and Calvin Klein Jeans. The four non-sexual advertisements were these brands: Wendy's, Marc Jacobs, Dove and Gap. Across each product-type, the logos of corresponding brands (sexual and non-sexual) were kept as similar as possible. For example, for fragrance, both Marc Jacobs and Dolce & Gabbana logos consisted of plain black text. For fast food, both Carls. Jr and Wendy's consisted of red bubbly font. For jeans, both Calvin Klein and Gap used a dark font on a plain background. For shampoo, both Aussie and Dove contained bright colours. The four filler advertisements were from these brands: Haagen-Dazs, AT&T, Walmart and Corona.

Television Programs

Prior to our pilot study to select advertisements, we chose three different television episodes to be used to accompany these ads in this research. Programs were taken from Australian television programs that had not been broadcast in the UK. The programs had been previously rated by a researcher using the Lull and Bushman (2015) scale for sexual content. The most sexual television episode and the least sexual television episode were chosen for the pilot study. The sexual program fulfilled criteria for the second level of the scale and the non-

sexual program did not fulfil any sexual criteria on the scale. The sexual program was *The Bachelorette Australia* (Season 3, Episode 5). The non-sexual program was *I'm a Celebrity...Get me out of here!* (Season 3, Episode 16). Both programs featured competitive elements, but one had a romantic theme and the other had a family-friendly theme.

Implicit Memory Measure: Logos and Image Degradation

Our implicit memory measure was constructed using the brand logos present in the selected advertisements. Thus, four were from the sexual advertisements, four were from the non-sexual advertisements, and four were from the filler advertisements. Four competing brand's logos were then selected for each product type to act as foils for the logos that appeared in the sexual or non-sexual advertisements. This led to a total use of 28 logos. The logos were edited to a maximum width or height of 1000 pixels in order to preserve the logo's spatial properties. All logos were centred on a white background, with the images 'diffeomorphically scrambled' (Stojanoski & Cusack, 2014) in order to impede their recognizability. We chose this method of distortion to maintain both the spatial frequency and perceptual organization of the image. The most degraded image used in the study was degraded 25%, making them unidentifiable, with 40 steps to the least degraded (i.e., complete) image (see Appendix).

Free and Cued Recall Measures

Two questionnaires were used as explicit memory free and cued recall measures. Each required the participant to recall the brand name and the advertisement scene. The first questionnaire measured free recall, and the second, a cued recall questionnaire, was a multiple-choice activity in which participants had to select brand names from a list and advertisement scenes from another separate list. Foils on the lists were constructed from the same foils used during the implicit brand logo recognition task (28 brands in total). Descriptions of the foils on the cued recall task were based on their real advertisements.

Procedure

We placed participants into individual cubicles, and gave them a detailed information sheet and consent form. They were told that the aim of the study was to investigate what factors influence an individual's television experience, and that they would watch a video on the computer followed by two questionnaires to complete (on the computer). It was made clear that participation was entirely voluntary, and that they could leave the study at any time. Following their informed consent, we told them to watch the videos carefully, as they would subsequently be asked some questions about the video content. We then showed the participants a video consisting of a 15-minute sexual or non-sexual television

program and three sexual or non-sexual advertisements at each of three advertisement breaks, distributed evenly at four different stages throughout the program excerpt. Participants were randomly assigned to either the sexual or the non-sexual program content. The order of presentation of the advertisement-types (sexual and non-sexual) was counterbalanced using a Latin Square design. Participants were then given a questionnaire attention check on the content of the program.

Following the attention check questionnaire, participants were given the implicit brand-logo memory task (see Figure 1) in which we determined whether they could accurately recognize the product logo from the distorted image. In this part of the study, participants were instructed to press the space bar repeatedly until they could recognize the brand of the distorted logo. Once they recognized the brand, they pressed a key to redirect them to a page to type in the name of the brand. The order of the logos was randomized. Next, participants were given the free recall task, followed by the cued recall task. Finally, they were asked about whether they had been exposed to the television program and advertisements before, to provide their age and ethnicity, and were given a debriefing as to the aim of the study.

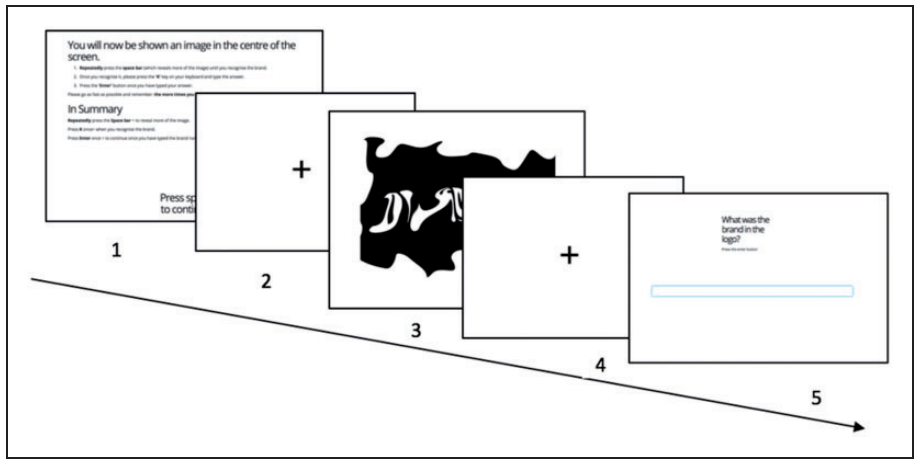


Figure 1. Structure of Implicit Brand Logo Recognition Task. Screen 1: instruction page. Screen 2: fixation cross. Screen 3: 40 images from the most degraded logo to least degraded, participant must press spacebar to move through images. Pressing 'K' brings the participant to a fixation cross on Screen 4, followed by Screen 5, which requires the participant to fill in the name of the logo. Each brand logo trial restarts on Screen 2.

Data Analysis

Initially, we inspected the data carefully for missing values, random responding, and evidence of normality. Because we had carefully overseen each participant's activities, we had no missing data. Further, inspection of the data suggested it was legitimate to proceed with the planned analyses with the exception of cued recall. Inspection of the plots for the cued recall scores revealed a ceiling effect in these data, with a skewness value of -1.30 – indicating marked negative skew in the distribution (Hair et al., 2016).

We coded the participants' responses to the implicit memory measure, based on their number of spacebar presses required for brand logo identification. This meant that lower values for brand logo identification indicated better logo recognition and implicit memory performance. For each participant, the spacebar presses required for identification of sexual logos were added together and those required for non-sexual logos were added together to produce a total score for the sexual brand logos and a total score for the non-sexual brand logos. We removed from analysis any trial in which the participant incorrectly named the brand that was first said to have been recognized.

Two raters coded the free recall questionnaire. One rater had experience with behavioral experimentation, and the other did not. Any minor discrepancies in rater scores were resolved through discussion between them to produce a final agreed upon score. The free recall questionnaire was coded on a points basis in order to form a total score for advertisement scene recall and a total score for brand name recall. Any one correct word or statement about an advertisement scene counted as one-point maximum per advertisement. If two features of an advertisement scene were correctly described, this would still amount to one point. One correct brand name counted as one-point maximum per advertisement. The maximum total score for the free recall of the advertisement scene was 4 for sexual advertisements and 4 for non-sexual advertisements. The maximum total score for the brand name free recall was 4 for sexual advertisements and 4 for non-sexual advertisements. The multiple choice cued recall questionnaire was coded additively, such that each detail correctly selected counted as one point. The maximum total score for the advertisement scene cued recall was 4 for sexual advertisements and 4 for non-sexual advertisements. The maximum total score for the brand name cued recall was 4 for sexual advertisements and 4 for non-sexual advertisements.

We analyzed the data using a 2×2 mixed analysis of variance (ANOVA), with program-type (sexual or non-sexual) as a between-participants variable and advertisement-type (sexual and non-sexual) as a within-participants variable, and with three dependent variables: (a) implicit brand logo recognition, (b) free advertisement scene and brand name recall and (c) cued advertisement scene and brand name recall. We set statistical significance at $p < .05$ for all analyses. We calculated the effect-size using partial eta squared where

appropriate following Richardson (2011) who noted that the partial eta squared is similar to the eta squared but where other independent variables and interactions are partialled out. He noted that partial eta squared is overwhelmingly cited as a measure of effect size in the educational research literature. We also conducted a Pearson correlation analysis between implicit and explicit memory scores in order to determine their relationship to one another.

Results

Descriptive statistics for the implicit memory measure (bar presses), brand free recall, and advertising scene free recall, as a function of advertisement type and program type are presented in Table 1.

Implicit Memory for Brand Logos

There was a significant main effect of advertisement type on implicit memory for the brand logos (see Figure 2). Participants made significantly more space-bar presses (revealing weaker implicit memory) in order to recognize the logos of brands using sexual advertising ($M = 92.96$, $SD = 35.00$) than to recognize the logos of brands using non-sexual advertising ($M = 68.94$, $SD = 36.31$), $F(1, 51) = 84.98$, $p < .001$, $\eta_p^2 = .625$. There was no significant effect of program type on implicit memory for brand logos (Sexual program: $M = 75.81$, $SD = 41.82$; Non-sexual program: $M = 85.91$, $SD = 28.31$), $F(1, 51) = 1.15$, $p = .289$, $\eta_p^2 = .022$. There was no significant interaction between advertisement-type and program-type on implicit memory for brand logos, $F(1, 51) = 0.51$, $p = .477$, $\eta_p^2 = .010$.

Table 1. Descriptive Statistics for the Implicit Memory Measure (Bar Presses), Brand Free Recall and Scene Free Recall, as a Function of Advertisement Type and Program Type.

Variable	Program	Advertisement					
		Sexual			Non-Sexual		
		<i>M</i>	<i>SD</i>	<i>Range</i>	<i>M</i>	<i>SD</i>	<i>Range</i>
Bar Presses							
	Sexual	88.77	42.61	4–164	62.85	41.03	4–164
	Non-Sexual	97.00	25.88	42–143	74.82	30.74	27–137
Brand Recall							
	Sexual	2.04	1.18	0–4	2.31	1.19	0–4
	Non-Sexual	2.26	1.16	0–4	2.22	0.89	1–4
Scene Recall							
	Sexual	2.08	1.35	0–4	1.54	1.14	0–4
	Non-Sexual	2.67	1.33	0–4	1.44	1.12	0–4

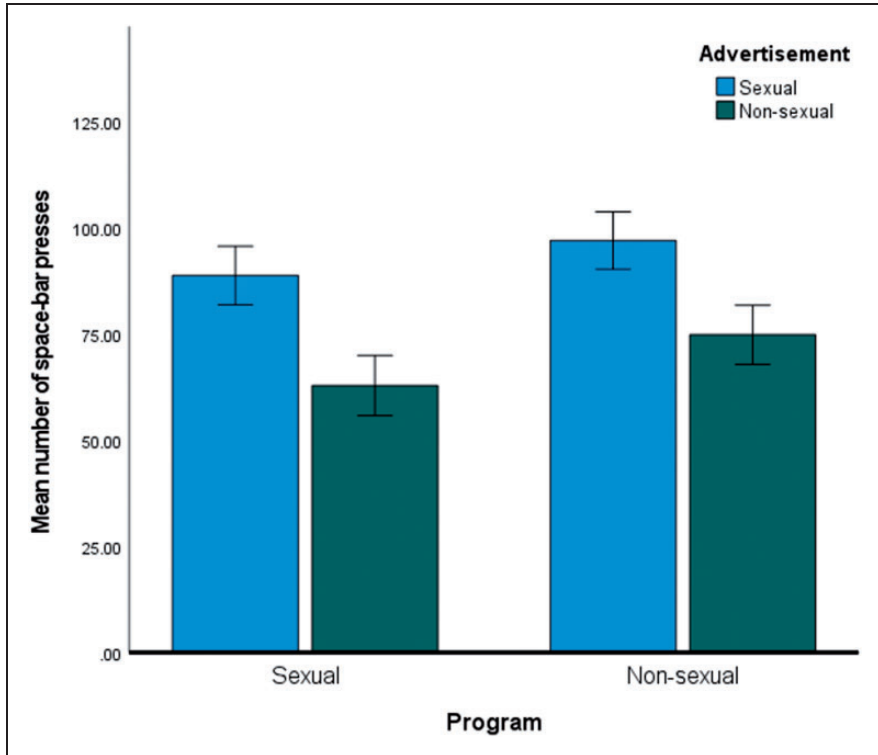


Figure 2. The Mean Number of Space-Bar Presses Required to Recognize Logos in the Implicit Memory Task as a Function of Advertisement-Type and Program-Type (± 1 SE).

Free Recall of Brand Name

Mean brand name free recall scores are shown in Figure 3. There was no significant effect of advertisement type on brand name free recall, (Sexual advertisement: $M = 2.15$, $SD = 1.17$; Non-sexual advertisement: $M = 2.26$, $SD = 1.04$), $F(1, 51) = 0.59$, $p = .447$, $\eta_p^2 = .011$. There was also no significant effect of program type on brand name free recall (Sexual program: $M = 2.17$, $SD = 1.19$; Non-sexual program: $M = 2.24$, $SD = 1.03$), $F(1, 51) = 0.07$, $p = 0.80$, $\eta_p^2 = .001$. There was no significant interaction between program type and advertisement type on brand name free recall, $F(1, 51) = 1.02$, $p = .317$, $\eta_p^2 = .020$. Thus H3 was not supported.

Free Recall of Advertisement Scene

There was a significant main effect of advertisement type on free recall of advertisement scene (see Figure 4), with higher recall scores for sexual ($M = 2.38$, $SD = 1.36$) than for non-sexual advertisements ($M = 1.49$, $SD = 1.12$),

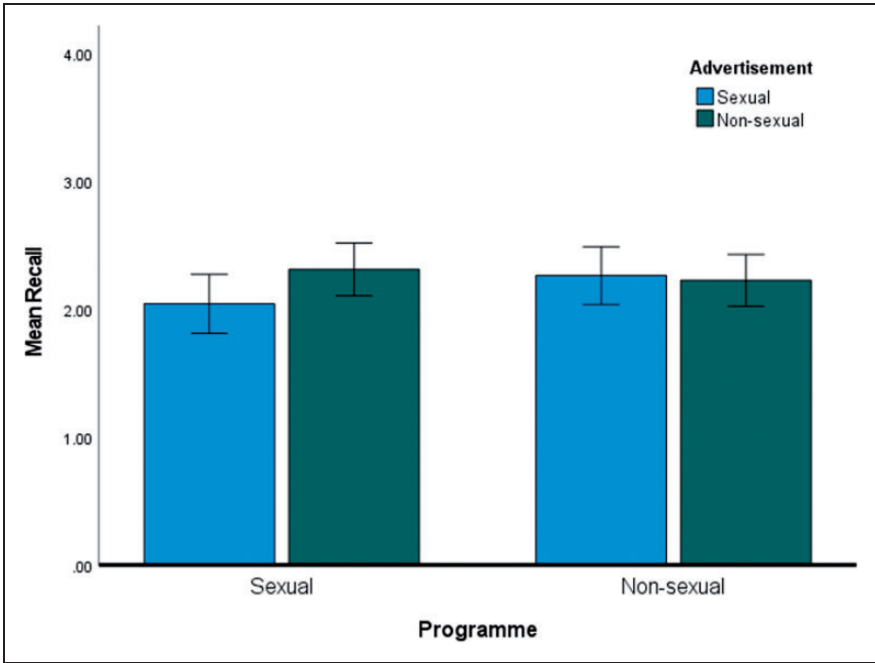


Figure 3. Mean Brand Name Free Recall as a Function of Advertisement-Type and Program-Type (± 1 SE).

$F(1, 51) = 28.64, p < .001, \eta_p^2 = .360$. There was no significant main effect of program type on free recall of advertisement scene (Sexual program: $M = 1.81, SD = 1.25$; Non-sexual program: $M = 2.06, SD = 1.23$), $F(1, 51) = 0.69, p = .410, \eta_p^2 = .013$. There was however a significant interaction between program type and advertisement type on free recall of advertisement scene, $F(1, 51) = 4.32, p = .043, \eta_p^2 = .078$. A simple effects post hoc analysis revealed that for the non-sexual program, free recall of sexual advertisement scene ($M = 2.67, SD = 1.33$) was significantly higher than free recall of non-sexual advertisement scene ($M = 1.44, SD = 1.12$), $t(26) = 4.55, p < .001, d = 0.88$. Within a sexual program, free recall of sexual advertisement scene ($M = 2.08, SD = 1.35$) was significantly higher than free recall of non-sexual advertisement scene ($M = 1.54, SD = 1.14$), $t(25) = 2.90, p = .008, d = 0.57$.

Cued Recall of Advertisement Scene

As a result of a ceiling effect (and negative skew) in these data, there was no significant main effect of either advertisement-type (sexual or non-sexual) or

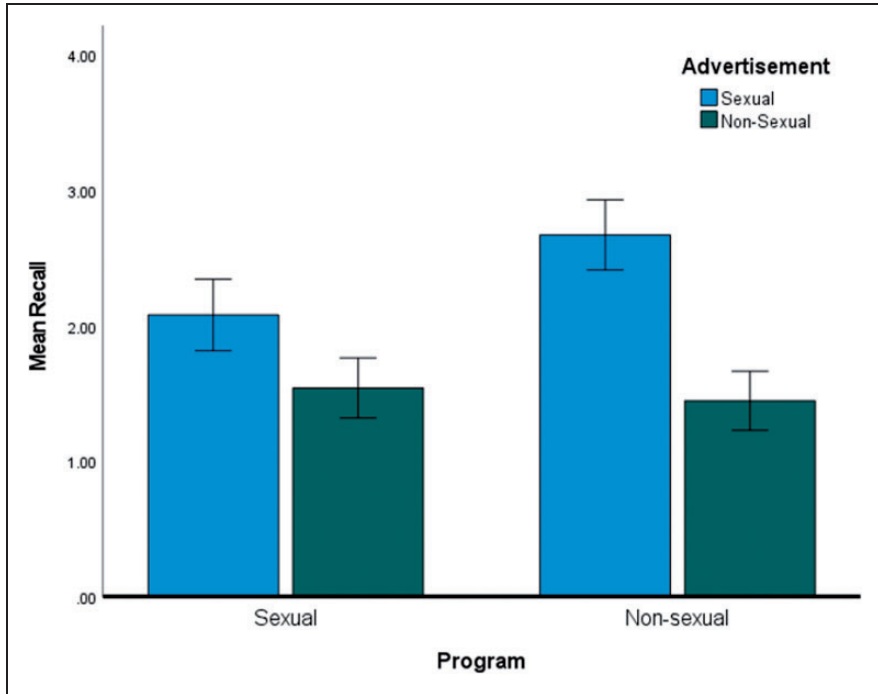


Figure 4. Mean Advertisement Scene Free Recall as a Function of Advertisement-Type and Programme-Type (± 1 SE).

program-type (sexual or non-sexual) on the cued recall measure for cued recall of the advertisement scene, and there was no significant interaction effect between advertisement-type and program-type.

Relationship Between Implicit and Explicit Memory Measures

There was a significant negative correlation between implicit and explicit memory measures, $r(53) = -.31$, $p = .025$. Since high scores indicated better explicit memory but low scores indicated better implicit memory, this negative correlation indicated a moderate positive association between these two types of memory.

Discussion

In this study, we affirmed our first hypothesis that advertising with sexual content would lead to our participants' better free recall of advertisement scenes, but not to better free recall of advertised brand names. Our findings are consistent with previous *explicit* memory evidence that advertisements using sexual

appeals were remembered better than those using non-sexual appeals, but that sexual appeals may be ineffective (as in our study) or even detrimental (as in some past studies) with respect to memory for the brand (Bushman, 2007; Parker & Furnham, 2007; Reichert & Alvaro, 2001; Wirtz et al., 2018). We did not affirm our second hypothesis that advertising with sexual appeals would lead to participants' better implicit memory for the brand logo. We found that sexual advertising led to significantly *worse* recognition of brand logos than did non-sexual advertising on our implicit memory task. Thus, sexual advertising had a negative impact on implicit memory for brand logo. Due to a marked ceiling effect on our cued recall scores, none of analyses of cued recall showed significant differences.

Our main finding was that sexual appeals only adversely affected implicit brand logo memory; and there was no significant difference between sexual and non-sexual advertisements with respect to explicit brand name recall. While we have added new data to the literature regarding *implicit* memory effects of sexual appeals on brand recall and provide new data regarding adverse effects on implicit memory to sexual appeals, our findings are in general accord with a recent meta-analysis that concluded that sexual appeals had no impact on explicit memory for brands (Wirtz et al., 2018). At the very least, our results further affirm *that sexual advertising is not beneficial for improving brand memory*, and, given our evidence of interference from sexual advertising with implicit memory for brands, and separate evidence that implicit memory is more sensitive to consumer behavior than explicit memory (Law & Braun-LaTour, 2003), *sexual appeals in advertising may not be an effective means of improving brand recognition*.

Our findings suggest that sexual appeals reduce *perceptual fluency* by negatively impacting consumer brand logo recognition or familiarity. While several theories have been used to explain the effect of sexual advertising on memory, most have been framed in terms of cognitive capacity. Lang's (2000) *limited capacity model* suggests that cognitive demands from a stimulus, such as sexual content, lead to superior encoding of the stimulus, while everything not central to that stimulus is, as a result, coded less effectively. Also, as noted above, *evolutionary emotional arousal theory* argues that cognitive overload caused by sexual content, should lead to poorer recall of all details that do not contain sexual content because individuals have an evolutionary pre-disposition to attend to evolutionarily significant cues like sex. As brand names and brand logos are not central to the sexual content, our findings also support both the *limited capacity model* and *evolutionary emotional arousal theory*.

Contextual Program Effects

We also explored the effect of program-type (sexual or non-sexual) on advertisement recall. There was no evidence of any brand or advertisement memory

difference on any of our implicit or explicit memory measures based on variance between sexual and non-sexual programs. Early research suggested that program type influenced advertisement recall (e.g., Bushman, 2005; Bushman & Bonacci, 2002), but more recent studies have failed to replicate those results (King et al., 2015; Leka et al., 2013), and our findings contribute to the growing impression that sexual or non-sexual program type does not impact advertisement memory. Those previous studies that found contextual effects from program type (Bushman, 2005; Bushman & Bonacci, 2002) were criticized on methodological grounds, in part defined by having confounded sexual and humorous content (Fried & Johanson, 2008). In the present study, we controlled for humorous content (by matching all programs on important criteria such as humor), and this may have contributed to our finding of no program context effect.

Of note, our sexual and non-sexual program types may have contained arousing material, as the non-sexual program contained images of insects and reptiles that may have been perceived as threatening. In the *transfer hypothesis*, sexual imagery is more likely to arouse attention and increased memory for all incoming stimuli, including the advertisements that follow (Krugman, 1983; Moorman et al., 2012; Sparks & Lang, 2015). Thus, if the non-sexual program was also arousing, the *transfer hypothesis* predicts memory facilitation even for the non-sexual program and advertisements in our study, perhaps confounding our intent to vary only sexual appeals, and contributing to our finding of null effects in the analyses of program type contextual effects on advertisement memory.

Program-Advertisement Content Congruity

We also explored the effects of program-advertisement congruity. Although many papers have failed to find congruity effects, we found evidence for them, consistent with some prior researchers (Furnham & Hiranandani, 2009; Furnham & Mainaud, 2011; King et al., 2015; Leka et al., 2013; Parker & Furnham, 2007). Although we found no interaction between program-type and advertisement-type for implicit memory of brand logo or explicit brand memory of brand name, there was a significant interaction between program-type and advertisement-type for explicit free recall of advertisement scene. In the context of both sexual and non-sexual program types, but especially in the context of non-sexual program types, sexual advertisements were better recalled than non-sexual advertisements. Thus, program-type moderated the extent to which sexual advertisement scene details were recalled, making congruity between program and advertisement with regard to sexual appeals detrimental to explicit recall of a sexual advertisement but not to recall for the brand.

This aspect of our study's findings support *cognitive interference theory* (Cruz & Lull, 2014; Dickinson et al., 2013; Furnham & Price, 2006), since the context of a non-sexual program interfered with the recall of a sexual advertisement

scene. This is consistent with the Von Restorff effect (Von Restorff, 1933) in which stimuli different from the surrounding context were found to more likely to be remembered. However, since recall of sexual advertisement scenes was always superior across program types and sexual program content did not facilitate recall of non-sexual advertisement scenes, it may be more appropriate to suggest that program-type acts as a moderator of recall of sexual advertising scenes.

An alternative explanation for our findings is that sexual content in programs is usually less extreme than sexual content in advertisements, minimizing the impact of the sexual content in programs on recall of sexual advertisements. The two media cannot be exactly congruous in sexual content, but we attempted to control this variability by using program and advertising content that received similar pilot participant ratings on a sexual content scale (Lull & Bushman, 2015). Overall, our findings suggest that program-advertisement content congruity only moderates memory for advertisements.

Limitations and Future Directions

Among this study's limitations, we did not measure and control for our participants' working memory ability, and this may have affected these results, given the size of the sample. Further, we only used female participants, and it is possible that there would have been significant sex differences in our results. Indeed, Samson (2018) who tested motivational information-processing and the distraction hypothesis found that sexual appeals enhance memory for the advertisements themselves, but they distracted men from processing brand-related information. Male participants encoded and recalled less brand-related information from advertisements with sexual appeals. In this sense we would expect stronger effects for a male population though this hypothesis awaits investigation. Also, it would have been better to have a larger, more representative sample in terms of age, education and media consumption habits.

One of the greatest problems in this research area is finding "real" stimulus materials (i.e., television advertisements) that are both equivalent and fulfil various criteria. The same is true of finding the programs in which to imbed them. We know that very particular advertisements can have a very powerful effect (King et al., 2015). This may in part explain the fact studies cannot always replicate effects, and that the evidence is sometimes even contradictory. What constitutes "sexual" differs from group to group and time to time which means results may not always generalise well. Thus, an inevitable difficulty in applied cognitive psychology is that necessary "real world" stimuli are often complex and confounded by many factors.

In future studies, cross-cultural comparisons would help determine whether participants in more and in less "liberal" societies respond to these modern images differently (i.e., whether sex sells more when it is considered taboo)

and/or exhibit different implicit memory effects to advertisements. Additionally, studies to date have investigated immediate, rather than delayed recall, and it would be interesting to examine the longer-term memory effects of sexual advertising.

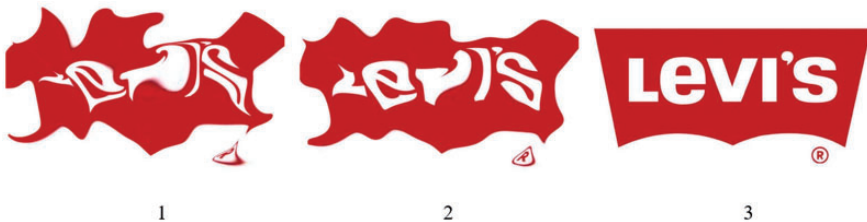
Conclusion

The point of all advertisements is to increase brand awareness and thence sales. The question for those in marketing is whether to include such things as sexual imagery or illusions in the advertisements in order to facilitate that process. This study, one of the first to explore implicit rather than only explicit memory, suggests that is not a wise decision to include this imagery, at least for female viewers. This area of applied research continues to attract attention (Vargas-Bianchi & Mensa, 2020) and warrants further study, with advances as recommended here.

Appendix

An Example of a ‘Diffeomorphically Scrambled’ Brand Logo

Three images of a ‘diffeomorphically scrambled’ brand logo from the implicit brand logo memory task. The first image is the most degraded (1st image presented in trial), the second image is middle-most degraded (20th image presented in trial) and the third image is the complete image (40th image presented in trial).



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