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Advertising: The Contribution of Applied Cognitive Psychology

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Abstract

This paper looks at the contribution of applied cognitive psychology primarily to the research on advertising. The first issue is to attempt to define and specify the unique contribution of applied as opposed to “pure” cognitive psychology to this research area. Next the issue of the medium of message delivery is discussed. The importance of programme involvement and mood impact on memory for advertisements is then discussed. The major part of the review looks at the influence of humour, sex, violence and unconventional sex roles in advertisements on their impact. An attempt is made to document important and replicated findings in this area. Finally, some effort is made to consider future avenues of research.

1. Introduction.

The broad aim of most advertising is to communicate and inform potential purchasers of a product, service or idea that influences their subsequent behaviour. It is an applied research area now with its own specialists. There are university departments, professors and journals in advertising, marketing and retailing who overlap in their interests, methodologies and theories. A researcher may choose therefore to publish his or her paper in the *Journal of Advertising*, the *Journal of Marketing*, the *Journal of Retailing* or those journals like *Psychology and Marketing* which attempt to “marry” different research areas. There has been a proliferation in both “general” and “specific” journals the latter considering such things as advertising to particular groups (i.e., children), the particular media (i.e., the web) or very particular products (i.e., food).

Psychologists from many different specialities particularly cognitive, media and social psychologists have been interested in advertising from many points of view. Inspecting all issues of *Applied Cognitive Psychology* from conception, there appeared to be 24 papers

directly investigating advertising, and a few more when the journal was called *Human Learning*. The topics covered included the effect of advertisement-programme content congruity; brand name and image; the effect of humour, nostalgia and sex on memory; memory as a function of the medium. This paper will review the role of applied cognitive psychology research to various aspects of advertising.

Inevitably there is competition and rivalry between specialists, some accusing others of being entirely derivative of their methods and theories, while occasionally there are “spats” over the scientific merits of a particular research method. It is probably true to say that the rigorous approach of experimental psychology has dominated the research in this area, and that many of the theories tested by advertising, marketing and retailing experts originated in psychology.

2. “Pure” vs Applied Cognitive Psychology.

As a consequence of the above it is difficult to specify the particular contribution of applied cognitive psychology to research on advertising. It certainly is the case that applied cognitive psychologists are “methodological purists” insisting the classic research design and analysis so as to avoid inappropriate inferences. Hopefully no paper gets published in the area that has confounded the design, not got a control group, or done the appropriate analysis. They insist on rigorous research albeit with “real world” stimuli.

However, where applied and “pure” cognitive psychologists most differ is with respect to researching advertising. There are probably two major differences. The first is theoretical. Pure and applied researchers are sometimes driven by quite different questions. Thus, pure researchers may be eager to evaluate and test some theory current in the literature while applied researchers may be driven to investigate issues currently important in the “real world” but of far less interest to those “in the ivory tower”. This is not to say that applied researchers ignore classic or modern theories but they are less concerned with testing them as opposed to applying them.

Second, and more importantly perhaps, is the use of real-world stimulus as opposed to carefully devised stimuli. In advertising research most applied cognitive psychologists use “real advertisements” designed not for experimental purposes but rather actual transmission. Thus in order to test a theory, say that sex in an advertisement effects memory they have to try to find advertisements that are as similar to each other in product, setting, length, one with sexual language and imagery and the other without any sexual overtones. This is inevitably a difficult

endeavour and can take many weeks of searching before a researcher is satisfied. Even then the stimuli may differ too much on other confounding factors for the pure researcher, and may feel obliged to devise advertisements that satisfy his or her experimental criteria.

3. The Dependent Variable.

Whilst cognitive psychology uses a wide range of dependent variables like reaction or inspection time, it is memory that is most often used in these studies. This may include free and cued recall as well programme (appreciation; involvement, mood change) ratings, and occasionally intention to buy. In most of the studies on television advertising the dependent variable is usually a mixture of memory and ratings. In this sense they have both tests of power and preference: memory is a power test with right or wrong responses, whereas ratings of mood intention to buy etc are preferences measures which have all the problems associated with subjective ratings. Occasionally applied cognitive psychologists use physiological measures of response to stimuli but this is rarely the case, although this may change in the future.

4. The medium for the message.

A number of applied cognitive psychologists have investigated whether identical material like advertisements, presented in different media is processed differently. The central question for this research area is: Do people remember more of what they have heard, seen or read? If asked the lay person about the “relative power” of audio-visual (AV) (television), audio-only (A) (radio), and print (P) (newspaper) medium, most (around 75%) argue the relative influence of television. They believe people will remember more if they process identical data via television

The researchers in this area have asked a number of questions:

- (a). Does it depend on the *content*: memory for news, advertisements, science programmes? The answer appears to be yes: print is always remembered best, but for advertisements, audio-visual is superior to audio-only, while for factual material audio-only leads to better memory. This is no doubt due to the time, money and effort put into the visual content of advertisements, compared to news.
- (b). Does it depend on the *audience*: adults vs children? Again the answer is yes, in the sense that children remember more from Audi-Visual material as opposed to Audio-Only material .

(c). Does it depend on *how memory* is measured: short vs long term, free vs cued recall? Here the answer is sometimes but the findings all go in the same direction.

There have been and continue to be a whole range of studies in this area looking at memory for the same news, stories and advertisements presented in different media (Furnham, Benson, Gunter, 1987; Furnham, Gunter, & Walsh, 1998; Furnham & Gunter, 1985; Furnham, Gunter, & Green, 1990; Furnham, 2001; Gunter, Furnham & Gietson, 1984; Gunter, & Furnham, 1986; Gunter, Tohala, & Furnham, 2001; Van der Molen, & van der Voort, 1997).

But why do people often remember least from television, compared to print. Five explanations are usually put forward. *First*, depth of cognitive processing. Reading involves most processing followed by listening and last by watching. *Second*, unlike the radio or television, reading allows for personal control over the speed and pace. Processing material at personal preferred pace enhances recall. *Third*, with news, but less so advertisements, there is often poor synchronicity between script and pictures as news-makers have to make do with whatever material they have available. Thus people may recall pictures better than the more complex text. *Fourth*, a person can paragraph and “chunk” the written text making it more organised and easy to recall. *Finally*, there is a methodological point that there is an overlap between medium of presentation, questioning and recall in the written material.

Research in this area continues with “the new media” particularly advertising on the web.

5. Moods, Involvement and Memory

Some programmes, for any viewer, are more involving than others. The programme may be about a topic of great interest to the viewer; or it may be an engrossing piece of fiction. It may be about sex or violence (see below). The question for the applied cognitive psychologist is how the programme effects the mood and involvement of the viewer and in turn his or her memory for advertisements during or after the programme.

A highly-involved person presumably perceives the programme as engaging and absorbing and is in a highly aroused and attentive. By contrast, an uninvolved person perceives the programme as irrelevant, uninteresting and superfluous. The central issue for advertisers here is whether to place advertisements in an involving or an uninvolved programme context to maximise the impact of the advertisement.

Research into the effect of programme-induced audience involvement on memory for commercials has produced conflicting findings, partly because of different methodologies used and the divergent ways of operationalising involvement (Norris & Colman, 1993). One way to measure involvement is a simple questionnaire half-way through, and at the end of the programme. Another method is to use “a feeling thermometer” which, by using continuous assessment, allows the researcher to get evidence of changes in involvement as participants using a slider show to indicate their degree of involvement from moment to moment (IJsselsteijn, de Ridder, Hamberg, Bouwhuis, & Freeman, 1998). The different methods used to measure involvement may to some degree explain the equivocal findings in this area.

Two main patterns of opposing findings have emerged. In some studies highly-involving programmes have been found to enhance memory for the embedded advertisements (Clancy & Kweskin, 1971). This has been explained in terms of attentional inertia: the increased level of attention and arousal caused by highly-involving programme contexts carries over to the processing of embedded advertising messages. In these situations, the viewer, who is in an aroused and attentive state of mind, is more likely to absorb the advertising material (Norris & Colman, 1992). However, these effects have generally emerged from non-experimental survey-type research, in which viewers are free to choose whether or not they would like to watch a particular type of programme (Lloyd & Clancy, 1991).

By contrast, in some studies highly-involving programme contexts have resulted in detrimental effects on memory for commercials (Thorson, Reeves, Schleuder, 1985). These findings have been explained in terms of the limited attentional capacity of the human information-processing system. This suggests that highly involving programme contexts require higher processing demands and drain cognitive resources. Consequently, viewers allocate higher levels of attention to the programme at the expense of attention to the commercials, thus failing to encode advertising messages (Norris & Colman, 1993). Similarly, in a study by Furnham, Gunter and Walsh (1998), higher levels of enjoyment of, and involvement with, a comedy were associated with lower levels of recall for the embedded advertisements.

Most of the studies mentioned below, particularly those examining sex, humour or violence, have looked at the involvement factor as a function of the surrounding programme.

6. Programme-Advertisement Congruity and Memory.

For maximum impact (i.e. good memory for the product and intention to purchase) should you place your food advertisement in a food or gardening programme? That is, should you maximise or minimise programme-advertisement congruity for effect. However, this may not always be a choice as there are sometimes legal restrictions on congruity as viewers may be less aware of the difference between the advertisement and the programme. Once again, there have been a number of applied cognitive psychology studies in this area (Furnham, Gunter, & Richardson, 2002).

However, conflicting patterns of results have also emerged with regards to the effects of programme-advertisement congruity on memory for commercials. Research in the area has been driven by two opposing theories: mood-congruency accessibility hypothesis or cognitive priming theory (De Pelsmacker, Geuens, & Ackert, 2002).

The mood congruency accessibility hypothesis states that the mood elicited by the programme context serves as a primer for processing embedded advertisements. In other words, if an advertisement displays elements that evoke a similar mood to the person's mood at the time of exposure, these advertising messages will be processed more easily. Note, this is about mood rather than content congruity.

Cognitive priming theory refers to the notion of construct accessibility. A construct is the representation of a particular piece of information or concept in memory. Constructs are interconnected in semantic memory on the basis of associations formed between distinct concepts. The strength of the associations depends on the level of similarity, congruity and semantic relatedness between concept representations (Bryant & Zillman, 1994). Construct accessibility then refers to the ease with which representations of concepts can be accessed in memory. Priming occurs when the activation of a particular concept in memory results in the simultaneous activation of an associated concept. Thus, priming acts as a reinforcer of associative bonds between constructs (Furnham, Bergland, & Gunter, 2002).

The notion of priming is particularly relevant to advertising. A programme context may strengthen the associations between elements of the programme and elements of a congruent advertisement. For instance, Furnham, Bergland and Gunter (2002) reported that recall for beer

advertisements was higher when the advertisements were placed in a programme featuring the consumption of alcohol. These results suggest that the activation of a concept from the programme context primes the processing of subsequent advertisements. This results in stronger associations between concepts activated by the advertisement and the programme and hence easier activation and accessibility of advertising messages during recall.

However, other studies examining congruity effects have reported a negative relationship between programme-advert congruity and memory for commercials (Furnham & Price, 2006). These results have been explained in terms of the theory of cognitive interference, which suggests that when an advert is presented within a similar programme content, the information from both sources merges together and the phenomenon of ‘meltdown’ occurs (Meyers-Levy & Tybout, 1989). Low cognitive elaboration for congruent advertising elements leads to difficulty in distinguishing the source of information between programme and advertisement. This in turn impairs recall for embedded advertisements (Furnham & Mainaud, 2011).

Cognitive interference theory suggests that if an advertisement presents novel, incongruent and unexpected information, it may stimulate a higher level of cognitive processing, and thus result in better recall of the commercial. Indeed, Furnham, Gunter and Richardson (2002) reported that recall of car advertisements embedded in a food programme (incongruent condition) was significantly better than of food advertisements in a food programme (congruent condition).

Why might programme-advertisement congruency improve memory for commercials in some cases but not in others? The two theories proposed to explain congruency effects suggest that they are valid in distinct situations. The moderating factor that may partially account for these seemingly contradictory findings is viewers’ involvement (De Pelsmacker, Geuens, & Anckaert, 2002). There are other issues like the degree on incongruity, as well as the particular properties of the advertisement (see below).

7. The content of the advertisement: Sex, violence and car chases!

When making an advertisement the designer has to make many choices as to how the product is portrayed: Who is in the advertisement? What is the setting? What “arguments” should be used to persuade people to buy? What imagery is best?

Content analyses have tended to concentrate on the sex role of the major actors. In the 40 years since McArthur and Resko (1975) published their paper on how men and women are portrayed in television advertisements there have been around a hundred replications and extensions in many different countries. There have been various reviews of this literature (Furnham & Mak, 1999; Furnham & Paltzer, 2011; Grau & Zotos, 2016; Matthes, Prieler & Adam, 2016). The studies have been done by cross-cultural, media and social psychologists particularly interested in whether gender stereotypes reflect those in the culture.

There are essentially two schools of thought to explain the possible significance and effects of stereotypes in advertisements on society: *the 'mirror' and 'mould' explanation* (Eisend, 2010). The mirror explanation proposes that advertisements reflect values inherent in society: thus stereotypes represent existing attitudes towards, and beliefs about, certain groups. They act as a magnifying glass echoing the dominant gender role concepts of their time. Advertisements therefore have little effect on social norms, as advertisers are not trying to influence society nor how certain groups are viewed, but use prevalent attitudes, beliefs and stereotypes to promote a product.

The 'mould argument', also called the cultivation theory, proposes that advertisers are indeed trying to influence social values and opinions in a target audience in order to promote their product. It is however not clear why they should be doing this. This theory suggests individuals are highly likely to imitate observed behaviour if it is perceived to increase the likelihood of gaining a social reward like approval. This is especially relevant as consumers of a certain product are usually portrayed as being socially rewarded, whilst non-consumers may be punished by being ignored. Therefore, if an advertisement draws heavily upon stereotypes- that may be inaccurate or negative representations- then observers (especially children) may be more likely to view these stereotypes as social norms, and behave accordingly.

Role congruity theory suggests that individuals should conform to the role expected by their gender's stereotype. Advertisements could therefore lead to behaviour at odds with modern social norms, as consumers bid to avoid contradicting the stereotype described by the advert. For example, as women who observed female models in subservient roles later reported lower self-confidence, less independence and fewer career ambitions. The repeated observation of such negative stereotypes at a young age could lead to children learning gender roles that are reinforced in adulthood by continued exposure to these advertisements.

Eisend (2009) in a meta-analysis of 64 studies found that advertising primarily depended on the widely accepted gender attitudes and values in a society with no significant lasting effects on viewer's attitudes (i.e., the mirror argument). This corroborates the assumptions of earlier researchers regarding how stereotyped advertisements were simply "lagging social indicators", i.e. the media perpetuating outdated perceptions which are no longer aligned with the current state of society rather than attempts to impose gender role beliefs.

Yet, it could be that the mirror and mould processes occurred at the same time but as a function of the product, the brand and the target group. Advertising both reflects and contributes to social values and beliefs (Grau & Zotos, 2016).

However, one focus of applied cognitive psychology has been on the specific use of sex, violence, humour and incongruous gender stereotypes. The central question is whether the introduction of any of these elements to an advertisement has a beneficial effect of memory for, and intention to buy, that product.

7.1 Sex

Bushman (2005) noted that although individuals tend to pay more attention to sexual content than non-sexual content of advertisements, the processing of sexual content demands a greater cognitive capacity and consequently limits the available cognitive resources to process other stimuli. In particular, for advertising effectiveness, audiences may pay attention to sexual advertisements, but not necessarily on the advertising message and may even be distracted by the sexual content (Bushman, 2007).

Studies on the effect of sexual advertisements have made use of advertisements of a sexual and non-sexual nature matched on a number of factors that have no relation to their sexual nature. These include the product, the duration of the advertisements, the brand that is being shown and the audience that it is being targeted. Some, but not all, studies have suggested, that advertisements that have sexual content are better remembered than advertisements that are not sexual (Furnham & Mainaud, 2011; Leka, McClelland & Furnham, 2013; King, McClelland & Furnham, 2015). For example, Fried and Johanson (2008) suggested that content which is sexual can serve as a distraction, and this interferes with processing of the product information, while King et al. (2015) concluded that "sex really does sell" based on their findings.

An important recent meta-analysis by Lull and Bushman (2015) found that as the sexual content in advertisements became more intense, attitudes, memory and intentions to buy the

brand all decreased. It was further found that brands that were advertised using sexual advertising were evaluated less positively compared to brands in neutral advertisements. This can be explained by emotional arousal theory, whereby people have an evolutionary predisposition to pay attention to cues that are emotionally arousing, such as violence and sex. As a result, cues that are sexual require more cognitive resources than cues that are not. Brands that are in sexual advertisements become peripheral when there is sexual content in the advertisements, as the sexual content becomes the centre of focus. As a result, people fail to recall brands from advertisements that are sexual which is consistent with the findings of Fried and Johanson (2008) and Parker and Furnham (2007). The most consistent message from this area of research remains “sex does not sell”.

7.2 Humour

Humour is widely used in advertising, with approximately 15 to 40 percent of television advertisements consist of humorous materials to some extent (Gulas & Weinberger, 2006).

In early studies Sternthal and Craig (1973) proposed that using humour in advertisements could enhance affective responses such as advertisement appeal and enjoyment, positive attitudes towards the advertisements and the advertised brands. Speck (1987) found that humorous content had significant impact on four attention measures: initial attention, sustained attention, projected attention and overall attention.

Osterhouse and Brock (1970) found that humorous advertisements have more persuasive power as they distract audiences. This in turn leads to decreased levels of counter argumentation and therefore, an increase in message comprehension. By contrast Duncan and Nelson (1985) suggested that humorous content may increase audiences' attention but not their comprehension or persuasion. Their findings showed that the high level of attention inhibits the advertising message.

These mixed result studies were explained by Weinberger and Gulas (1992) with three possible reasons. *Firstly*, there has not been a consistent empirical definition of comprehension among the studies some used a single recall measure whilst other used multiple measures. *Secondly*, different types of humorous advertisements were used including, comic wit, satire, full comedy, and sentimental humour, which would all have different effects on comprehension. Indeed,

there are different types of humour, such as, self-enhancing, self-defeating, affiliative, sexual and aggressive (Martin et al., 2003). This variation induces differences in advertising effectiveness in relation to how the general audience perceive it, and may in part explain the equivocal findings in this area. *Thirdly*, the variation in the types of products used in advertisements, whether if they were actual or fictional products might have contributed in the contradicting evidence.

Chung and Zhao (2003) found significant positive relationships between humorous advertisements and audiences' memory recall and attitudes. Goldberg and Gorn (1987) established that emotional advertisements lead to more positive reactions compared to informational advertisements. There was a significant programme by advertisements interaction, particularly emotional advertisements were found to induce a happier mood and influenced more by the programme context effect. Emotional advertisements such as those containing humour content are more likely to be remembered and associated with positive attitudes.

Opposing views support that humour can act with negative distraction effects, inherently harming recall for the advertisement. Many studies have found no evidence for the influence of humour on purchasing intentions (Zhang & Zinkhan, 2006). This would suggest that the effectiveness of humour in advertising could not be extended to its persuasive effects on brand choice. Hansen, Strick, Van Baaren, Hooghuis, and Wigboldus (2009) further examined explicit and implicit memory, finding that explicit memory for a brand was lower in non-humorous ads, while implicit recognition was identical for both humorous and neutral ones. This suggests that although humour distracts, resulting in weaker explicit recall, implicit memory stays intact.

In one recent study done in South Korea, Han et al. (2017) placed humorous and non-humorous advertisements within two programme contexts: humorous and non-humorous. When the programme ratings of humour, enjoyment and involvement were higher, unaided recall was poorer. Also recall of the advertisements was better when they were embedded within a non-humorous programme. Overall, both free and cued recall were higher for humorous advertisements than for the non-humorous advertisements.

Again, whilst there are equivocal results it does seem "humour sells"

7.3 Violence

Numerous studies have shown the prevalence of violence in television and other media (Scharrer et al., 2006). The central question here is are violent advertisements better remembered than equivalent non-violent advertisements. It has been found that violence scenes during commercial breaks do not only occur during violent programmes indicating incongruity (Shanahan, Hermans & Hyman, 2003). This results in some commercial breaks having a significantly higher level of violence than the programmes they are placed in.

One explanation for this violence level in television advertisements is to attract the attention of the audience: it has been found that more attention is paid to violent videos than non-violent videos (Williamson, Kosmitzki, & Kibler, 1995). It has also been found that more attention is paid to shocking content in advertisements (Dahl, Frankenberger, & Manchandra, 2003). The younger population is attracted to programs containing violence (Bushman & Philips, 2001). This partially explains why advertisers spend more money on violent programmes despite these programs attracting fewer viewers overall (Hamilton, 2000).

Research has shown that media violence can have long term emotional effects on children (Cantor, 2001). It has also been found that there are a higher percentage of violent adverts aimed at children than the general population (Larson, 2001; Maguire, Sandage & Weatherby, 2000). An analysis of children's advertisements showed 37% contained at least one violent act (Larson, 2001), compared to 3% for adverts aimed at the general audience (Maguire et al., 2000). Analysis of 92 food advertisements aimed towards children found 62% had a violent surface theme (Rajecki et al., 1994).

Recent research has indicated that a 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 non-violent 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 theorised that cognitive effort

becomes deflected from processing the advertising to reducing the anger brought on by the adjacent program violence. This effect was attributed to the cognitive responses generated specifically by violent content. Support for this hypothesis was derived from earlier research that found that mood affects memory (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 (Bushman, 1995; Bushman, & Geen, 1990; Bushman & Anderson, 2001).

In one study Gunter et al. (2005) found the non-violent version of the target advertisement was less well remembered when placed in the violent film than in the non-violent film supporting Bushman and Bonacci (2002). In contrast, the violent version of the target advertisement was remembered much better than the non-violent version when placed in the violent film sequence. Furthermore, the violent advertisement benefited from being placed in a violent film context as compared with the non-violent film context. Overall, the violent target advertisement was better recalled than the non-violent version. Participants' hostility scores were higher only after watching the violent film, and this mood change was associated with an impairment in the memory of the non-violent advertisements, while enhancing the memory of the violent advertisement, providing some support for Bushman's (1998a) hostile-thought hypothesis.

Certainly there are different types of violence (e.g. visual, verbal) and a general concern with advertisers upsetting the audience. One concern is whether violence affects mood which affects recall and indeed the cost of the attention grabbing nature of violence. Overall the results suggest that "violence does not sell".

7.4 Unconventional Sex Roles

Previous research has briefly looked at the effectiveness of unconventional sex roles (nearly always men) in advertising (Kolbe & Muehling, 1995). Debevec and Iyer (1986) considered men in radio advertisements and found that breaking male stereotypes led to better evaluation and higher levels of purchase interest in advertised products, such as dishwashing liquid. These findings were supported by Vantomme, Geuens, and Dewitte (2005), who showed that deodorant adverts depicting non-traditional gender roles, such as men being nursery school teachers rather than construction workers, elicited greater preference both explicitly and implicitly for the product.

Most of the studies focused on adverts depicting exclusively female roles and resulting attitudes towards these women when determining the effectiveness of the advert (Wolin, 2003). Scheibe (1979) suggested that people would exhibit better recall of adverts depicting new gender, rather than traditional roles. Jaffe and Berger (1994) found that non-traditional adverts portraying women as egalitarian or 'superwomen' was preferred across genders. Bellizzi and Milner (1991) also showed that an unconventional presentation of a car repair service including a female voiceover was favoured by women.

However, research has not always pointed in the same direction (Whipple & Courtney, 1980). Duker and Tucker (1977) demonstrated that traditional housewife advertisements were more effective than non-traditional portrayals presenting a working mother, a modern woman or a professional. Interestingly, Vantomme et al. (2005) found that adverts promoting fictitious mobile phones elicited an explicit preference for adverts depicting non-traditional roles, but an implicit one for those featuring female traditional roles. The variation in the above findings can be accounted for by possible mediating factors, such as gender attitude, sex or social identification (Orth & Holancova, 2004).

This remains a relatively new area of research so it difficult to decide whether "unconventional sex roles sell".

8. Inconsistent Findings

The findings in the area of sex, humour etc are certainly far from consistent. Thus one might see papers with opposite titles, implying both that sex sells or doesn't sell. There are three reasons for this, not uncommon state of affairs. The *first*, is that because all studies used actual available advertisements researchers had to "make do" with what was available. It is impossible to find enough advertisements to consider subtle distinctions within a category like sex, violence and humour. Thus, with humour one might distinguish between verbal and visual humour; aggressive or sexual humour etc. The same distinctions could be made with sex. Indeed one advertisements can have a "von Restorff effect" such as that in the study by King et al. (2015) where one advertisement with all actors being totally naked was responded to completely differently from all others. Thus some studies may have humorous adverts which are primarily associated with verbal humour and the other with visual humour which have different effects on memory

Second, there are often mediation effects of individual differences. These studies do not have very large population groups usually 20 or 30 people per group in a classic 2x2 design. Where possible these groups are matched on such things as sex, age, and education but not on many other potentially confounding or mediating variables.

Third, studies differ in the dependent variable. Some choose free recall, others cued recall while yet others use ratings of intention to buy. Where studies have used multiple dependent measures it is clear that they reveal different results.

These inconsistencies should not be read as an example of the “replication crisis” in psychology. Rather they reflect the many problems of applied vs “pure” research.

9. Conclusion

Applied cognitive psychologists have made an important contribution to our understanding of advertising. They have attempted, amongst other things, to try to understand when and why advertisements are remembered, as well as the factors leading to brand awareness and the intention to buy. They have struggled with the problems of designing rigorous and robust studies but using real-world stimuli designed for a quite different purpose. They also have to face the problem of many potentially confounding, mediating and moderating variables which in part explains the problems of poor replication. Nevertheless, there is now a good body of replicated findings which should help those in marketing and advertising make better decisions about how to design and place advertisements for maximum effect.

Future work in the area will no doubt reflect changes in technology and the new media.

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