BEHAVIOURAL EVALUATION OF ADVERTISING MEDIA

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If, as has famously been said, 'I know that half of my advertising has been wasted but I don't know which half', it's time we understood more about the link between budgetary spend and waste. Essentially there is budgetary waste if you go on 'preaching' to the converted, and there is budgetary waste if you spend your time 'preaching' to the unconvertible. Setting generalized media exposure goals (3+ OTS) against generalized target groups (18-34 men) is a recipe for waste. A means of predicting differences in the rate at which sub-sections of the target audience will 'take-up' OTS (opportunities to see advertising) and retain the knowledge over time is required to provide a more effective means to determine and distribute advertising weight.

In a standard media schedule evaluation comparison we judge one schedule against another on the basis of 'effective' reach. What constitutes 'effective' reach is in reality extremely complex but in practice is made using a simple concept of frequency (for a given cost). Effective reach may be taken as total gross contacts delivered, net contacts delivered – at least 1, at least 3, at least 5 etc. or weighted net reach where a (relative) value is applied to each level of exposure (= a 'response' curve) and summed to provide an 'effective reach' score.

But 'effect' will not be based on frequency alone. The 'person', through his or her selective perception mechanism, will 'decide' whether to 'take up' the advertising opportunity presented or not, and the advertising delivery vehicle will exhibit different degrees of 'force' in breaching the selective perception barrier.

This paper reports on the results of an investigation into the effects that personal interest and brand proximity have on the 'take-up' of (press) Opportunities to See (OTS). A second more complex and extensive study, to be completed by the end of the year, will cover additional interrelated factors in the response equation, media force/synergy, exposure timing and frequency effects on immediate and longer term knowledge retention.

Our thesis is that the 'take up' of an advertising OTS is primarily determined by the individual and we may expect quite different levels of 'take up' between different population segments. Not only therefore must we consider 'target group' definitions but also 'response group' definitions in building and evaluating a media plan. This implies that we appropriate classification data in the media survey to define 'response' groups

What therefore are the factors that influence response and permit a useful population segmentation into meaningful 'response groups'? We decided to test two hypotheses: the first being 'interest' in the product area and the second being 'brand proximity' (defined by knowledge, attitude and use).

We knew of course, before embarking on this programme of research, that schedule selection decisions were indeed sensitive to the 'interest' composition of a schedule. This is demonstrated by the following simple comparison of two schedules based on Orvesto Konsument/TGI data from Sweden, which includes interest data for a wide range of product areas. The target groups were those who, when buying a car, would buy a new (not used) car in the price range €30-40,000. Two equal cost schedules were developed. Schedule 1 consisted of insertions in daily and evening newspapers only. Schedule 2 used the same newspapers at a reduced level but included some motoring and general interest magazines. The results of the two schedules are shown below using the usual evaluation criteria.
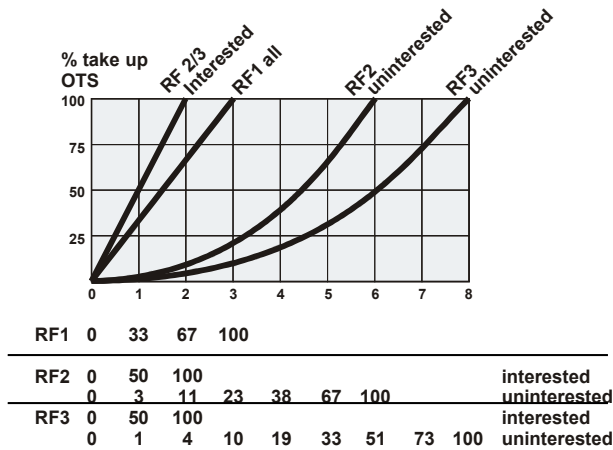
Table 1	Sched 1	Sched 2
Gross reach %	307.2	293.4
Net reach %	80	80.3
Ave OTS	3.8	3.7
Cost per GRP	4160	4355
See 3+	55.7	54.7
See 5+	27.1	23.8
See 10+	1.3	0.4

On all evaluation criteria (except marginally on Net 1+ Reach) schedule 1 is more 'efficient'. However if we were to divide the overall target groups into two 'response groups' namely those 'interested in private cars' and those 'not interested in private cars' and introduce a different rate of OTS 'take up' for each of them then we might come to a different decision.
habits and so on. Thus, the pre-designated sample is divided into the responders and the non-responders.

We set up the following 2 sets of weights (RF2 and RF3) to differentiate the possible differences in the rate of 'take up' between those interested and those not interested in private cars. In RF1 both target groups were treated equally in terms of 'take up'.

Figure 1

Response by Interest/Non Interest

| % take up OTS | RF 2/3 Interested | RF1 all | RF2 uninterested | RF3 uninterested |

RF1	0	33	67	100				
RF2	0	50	100					interested
	0	3	11	23	38	67	100	uninterested
RF3	0	50	100					interested
	0	1	4	10	19	33	51	73	100	uninterested

In RF2 the assumption is that the 'take up' by the 'interested' group maximises at 2 OTS while this does not happen until 6 OTS for the 'uninterested' group following a slow start at 1-4 exposures. In the RF3 assumption the 'take up' by the 'interested' groups remains the same, maximising at 2 OTS, while the 'uninterested' group 'takes up' even more slowly and does not maximise until 8 OTS.

Since the profile of the gross contacts offered by the two schedules differs considerably in the proportion of 'interested/non interested' the differentiation of 'take up' levels leads to a different decisions about the most 'effective' schedule. The table 2 below shows the differences in profile between the schedules and table 3 the resulting 'effective reach' scores from applying these differing 'take up' rates between response groups.

Table 2

% Gross reach	Sched 1	Sched 2
Interested in private cars	73	80
Not interested in private cars	27	20

Table 3

Effective Reach using	Sched 1	Sched 2
RF1	66.8	66.3
RF2	52.2	52.3
RF3	54.0	54.9

The down-weighting of the rate of 'take up' amongst 'uninterested' people with RF2 and RF3 has therefore a greater effect on schedule 1 reducing its 'effective reach' score more than for Schedule 2. This has resulted in the schedule 2 'Effective Reach' score just exceeding Schedule 1 in the case of RF2 and well exceeding it in the case of RF3, thus changing the schedule selection decision.

Of course there is an inter-relationship between the *target* group definition and the *response* groups' definition. It may be that the campaign strategy is to focus only on reaching the 'interested' segment within the target groups; the target group is then defined in this way. There would then be no need for subsequent response segmentation.

Such strategy decisions have important implications for the advertising budget. The budgetary requirement is going to be dictated by the 'cost per effective reach point'. Thus an 'interested' target will be reached relatively cheaply. Extending the target to include the 'uninterested' would generate a larger 'cost per effective reach point' and hence require a larger budget. In this way budgets can be established to achieve different targeting strategies. However, schedule construction objectives become more complex. Schedule Construction programs would now have to control the distribution of contacts between response groups in such a way that over and under exposure (in a given time period) is minimized.

But first we need to establish if 'interest in the product area' or 'brand proximity' does indeed significantly increase the level of viewing and retention of advertisements?

The Study Methodology

The Survey

The study was commissioned by Bucknull and Masson and conducted by the University of Nottingham, School of Psychology.

An online survey was conducted in the period 31-01-05 to 07-02-05. Apart from collecting demographic and general interest data, the aim of the questionnaire was to establish interest in four domains (mobile phones, health, shampoo and technology). The questionnaire contained five questions for each category, with answers on a scale of 1 to 5. Additionally, we measured the 'proximity' to 16 products (four in each category) by asking the respondents about their familiarity with, use of and attitude towards each product.

E-mails notifying of the questionnaire were sent out to all undergraduate psychology, chemical, mining and environmental engineering students (N = ± 900). The questionnaire was completed by 221 students + staff (178 female, 43 male). Out of these respondents potential participants were selected on the basis of their interest scores on the four interest domains (mobile phones, health, shampoo and technology). They were invited to take part in the study if their score in one of the domains was either in the bottom or top 10% of the survey population, to ensure that the participants in study 1 would represent a large interest range in each domain.

This universe is very specific and drawn from an essentially homogenous group of people, we may expect therefore that findings of significance in this group will be of equal or greater significance in the general population.

Participants

Thirty-one students (7 male, 24 female) with an average age of 20.4 (± 1.2) took part in the study.

Apparatus

A virtual magazine, consisting of 32 double pages, was presented onto a computer screen Each double page comprised a full size advert on one side and an editorial on a random subject (e.g. cinema, books, gardening, cars etc.) on the other side. The magazine included eight adverts for each of the four interest domains. The side on which the advert appeared was varied, as well as the combination of the advert and the editorial and the order of the pages. Participants could move on to the next page by pressing the space bar. Eye movements were recorded using an SMI Hi-Speed Eye tracker.

Design and procedure

Participants were instructed to read through the virtual magazine at their own pace. They were informed that this would be followed by a memory test, but they were unaware that this would only be related to the adverts. The memory test consisted of two parts. In the first part (**'brand memory test'**), participants were shown 48 pictures of an advert (12 from each product domain) with the brand name(s) pixilated (See Figure 1 below). Their task was to choose the corresponding brand name out of a list of four choices (all were brand names in the same product category). Following their response the participants were asked whether they thought they had seen the previous advert in the virtual magazine (**'recognition test'**). The entire experiment lasted about half an hour.

Figure 2. An example slide of the brand memory test

Results

In this section, results are reported that compare the dependent variables (brand memory, recognition scores, and eye movement parameters) for high and low interest domains as well as high and low product proximity.

To create interest scores that are comparable across interest domains, the survey score for each domain interest (out of 25) was converted to 'percent ranks' (the rank of the score in the survey population data as a percentage of those data). A similar procedure was employed for the 'product proximity' data (a combined score of the 'familiarity', 'usage' and 'recommendation' scores from the questionnaire for 4 products in the category).

For each participant data for their highest interest category (out of 4) is compared to their lowest interest category (and similar for product proximity):

High Interest – category (out of 4) with highest relative interest score

*Low Interest* – category (out of 4) with lowest relative interest score

High Proximity – category (out of 4) with highest relative product proximity
(= familiarity, usage + recommendation) score

Low Proximity – category (out of 4) with lowest relative product proximity
(= familiarity, usage + recommendation) score

Memory Scores (analysed across brands)

Brand memory test
After an advert had been presented in the virtual magazine, participants were significantly better at identifying the correct brand name for that product, $F_{(1,30)} = 17.19$, $p < .01$. Although there was no main effect for interest level, $F_{(1,30)} = .22$, $p = .46$, the interaction of interest level and whether the advert had been presented was significant, $F_{(1,30)} = 4.29$, $p < .05$ (Figure 2). Paired t-tests showed that the effect for the presence of the advert was only significant for high interest adverts, $t_{(30)} = 4.88$, $p < .01$, and not for low interest ones, $t_{(30)} = 1.48$, $p = .15$.

Figure 3. Brand memory as a function of domain interest
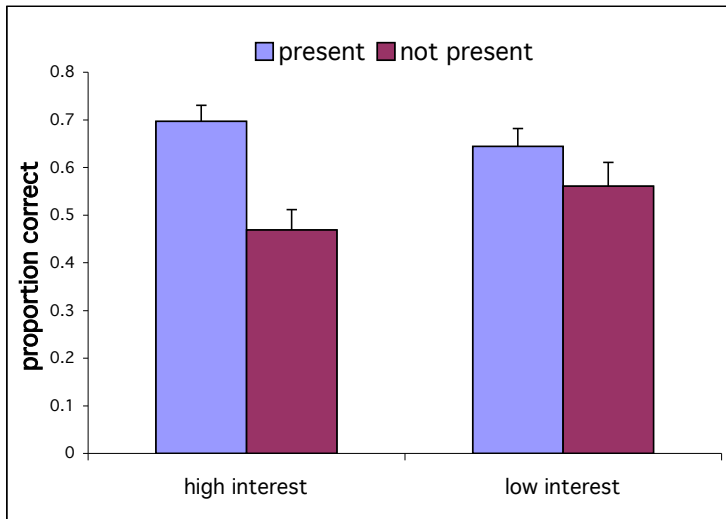
When looking at the same data as a function of product proximity (Figure 3), a significant main effect was found for the advert having been presented or not, $F(1,30) = 5.95$, $p < .05$, but not for proximity level, $F = 2.05$, $p = .16$. There was no interaction, $F(1,30) < 1$.

Figure 4. Brand memory as a function of brand proximity
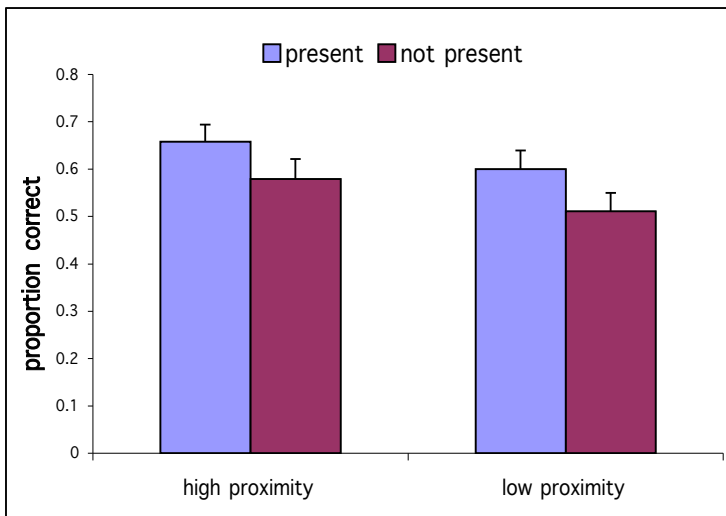
Recognition test

Participants correctly identified whether adverts had been presented in the virtual magazine or not for 79% of the adverts in high interest domains versus 72% in low interest domains (Table 1). This effect reached significance ($t(27) = 2.03$, $p = 0.05$). Comparing high versus low product proximity scores shows 79% versus 78% correct answers, respectively ($t(27) = .21$). This demonstrates that interest modulates recognition memory but proximity does not.

Table 4.   Summary table of the means of all dependent measures (± SE) as a function of interest level and product proximity. Means with a superscript are significantly different from one another.

	High Interest	*Low Interest*	*High Proximity*	*Low Proximity*
Brand memory (%) **_Advert presented_**	70 (3)[a]	64 (4)	66 (4)	58 (4)
Advert not presented	47 (4)[a]	56 (5)	60 (4)	51 (4)
Recognition score (%)	79 (3)[b]	72 (4)[b]	79 (3)	78 (4)
Total viewing time (s) of ad page	3.00 (0.40)[c]	2.53 (0.34)[c]	2.65 (0.36)	3.05 (0.45)
Average fixation duration (ms)	226 (9)	225 (9)	217 (9)	222(10)
Brand name viewing time (ms)	233 (38)	215 (33)	288 (48)[d]	153 (23)[d]
Average brand name fixation duration (ms)	163 (13)	149 (11)	154 (11)	143 (12)

Eye movement Analysis

On average, participants spent longer viewing adverts in their high interest domain than adverts in their low interest domain (M = 3.00 and 2.53 seconds, respectively), t (30) = 2.11, p < .05. The viewing time was not different when comparing adverts of high and low product proximity (Table 1). This suggests that interest in a domain increases advert viewing time, whereas product proximity does not affect it. There was no effect of interest or proximity upon average fixation durations on the advertisements.
Total inspection of the brand name in an advert was not different for high and low interest adverts (t (30) = .96, p = .34). However, interestingly, on average participants spent longer (288 ms vs. 153 ms) looking at brand names when they were of high proximity than of low proximity products (t (30) = 3.02, p < .01). Just like the average fixation duration for the entire advert, fixation durations of the brand name/ logo did not differ for high and low interest or high and low product proximity.

Relation between viewing time, recognition scores and brand memory scores

Participants who spent more time looking at the adverts were better at remembering whether they had seen an advert in the virtual magazine or not, as shown by a significant correlation (r = .414, p < .05). Furthermore, participants who were better at recognising the adverts from the virtual magazine were more likely to correctly identify the corresponding brand name for adverts that had been shown (r = .562, p < .01).

Individual brand analysis

Correlational analysis of the 16 brand names that were included in the online questionnaire revealed that the three individual items of the proximity construct (familiarity, use, recommend) were all highly correlated (with correlations varying from .53 to .86), justifying our use of a combined measure of the three items. Furthermore, it was found that the more familiar a brand name, the less time participants spent looking at a particular advert (r = -.607, p < .05). This was not related to brand memory for that advert. Brand memory was also unrelated to the average time that was spent looking at a brand name/ logo. Total inspection time of brand names in the adverts was only related to the size of the brand name/logo.

Summary

Based on definitions of interest and product proximity as stated in the results section, we found that the level of interest in a certain domain affects both advert viewing time and memory for those adverts. Participants spent more time looking at adverts of high interest domains. They were also more likely to remember whether they had seen an advert in the magazine when the adverts were of their high interest category, and they were better at identifying the brand names for high interest adverts that had appeared in the magazine than the ones that had not. Product proximity did not affect any of the measures, apart from brand name viewing time (longer viewing times for high proximity products). We also found that participants spent less time looking at adverts of familiar brand names.