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AN APPRAISAL OF
MEDIA WEIGHT TESTS

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INTRODUCTION

This report considers the topic of media weight testing: that is, the examination of the effect of different levels of media advertising spending on behaviour in the market. In a simple test, for example, the level of expenditure is increased above normal in one area and the sales, brand shares or attitudes in that area are compared to those in other, comparable areas where normal weights of advertising are maintained.

Although media weight tests are a much practised marketing exercise they would seem rarely to produce conclusive, or useful results. The MCRU has found that within the body of experiences of Sponsor companies only about one in twenty media weight tests have produced conclusive results. Similarly, discussion with other market researchers has suggested the same order of magnitude for the success ratio. Also a study reported by Clancy (1972, 1638) suggests the situation is not much better in the U.S.A.

In order to formulate guidelines for successfully conducting media weight tests, it is necessary to establish, illustrate and understand the reasons giving rise to the usual failures. These reasons can be categorised in two ways:

A - statistical, quantifiable reasons

B - conceptual and managerial reasons, which tend to be less easily quantifiable

After the problem has been defined, this report is set out in three parts:-

Part A considers and establishes why the circumstances of the market place may render it unlikely that many media weight tests will produce any detectable changes in the market place;

Part B considers the market and organisational context in which this sort of exercise is usually conducted and against which it has to be assessed; and

Part C discusses the implications of these findings and presents guidelines for successful media weight tests.

What is a media weight test?

A media weight test usually involves experimentally varying the advertising weight away from normal levels in different areas of the country, or in different towns, and then measuring the results. The measurement is usually done in terms of changes in sales, market share and/or awareness and attitude variables. The procedure can be used to attempt to assess the effect of changes in expenditure in individual media (press, television, outdoor etc.) and also for assessing mixed media allocations.

The stimulus for most media weight tests seems to be an attempt to answer questions like:

- Are we spending about the right amount on media advertising on our product?
- Would an increase of X% in our media advertising improve our market share?

These questions typify the nature of those frequently asked. There are others, perhaps more fundamental, which should be posed and these are considered in Part C of this report.

One of the potentially most interesting outcomes from a media weight test would be that a substantial, reduction in advertising expenditure has no harmful effects and so advertising money could be saved. However, this aspect is explored less often and most tests attempt to probe the affects of increased expenditure. Therefore, the contents of this report tend to concentrate more on this latter exercise.

Media weight tests in Direct Response Markets offer opportunities for detailed analysis not normally available in other markets. Little is published on the results of media tests in these markets and this report does not deal specifically with this area.

Simple media weight tests are fairly easy to conduct, once the funds have been obtained, but the problem is that they often seem to produce disappointing outcomes.

PART A STATISTICAL AND QUANTIFIABLE REASONS WHY MEDIA WEIGHT TESTS OFTEN
 CANNOT BE EXPECTED TO WORK.

Introduction

In view of the high frequency of failure of media weight tests one must ask whether they should be expected to give conclusive results. Are there some fundamental reasons which suggest they are bound to fail? In many circumstances in which media weight tests are conducted the answer to this question would seem to be - yes!

In order to suggest and illustrate some of the probable underlying causes of the failure of media weight testing, some data on several major product categories will be used in succeeding sections. These are not meant to be representative or proof of assertions made, but illustrative of the principles suggested to be important considerations.

Proposition 1) Many markets are not very susceptible to change

The most important reason why media tests rarely work may be because market shares on many product categories are unsuceptible to change.

In many established markets, market shares vary so little from year to year that one could say that an equilibrium state exists. In some of the older markets or in neo-commodity*ones, trends in market shares are usually influenced by factors outside the promotional sphere.

Though the reasons for this overall stability are not the subject of this report some evidence and indicators can be cited. Ehrenberg (1969)1538 has, in effect, through extensive analyses established the stability of myriad markets in various countries. It would also seem probable that as expertise has been applied to all aspects of marketing major products and services by all organisations, particularly in competitive markets, it is only natural that by now a stable situation has been reached in most markets. The introduction of new brands or products into stable markets tends to upset the balance initially, but relatively soon they settle down to the new, fairly constant,

* defined as large and long established where distribution and price are often the key determinants in the sales or market share of a product.

brand shares. For example, the introduction of fluorides into the tooth-paste market made a major disturbance in what was a stable, though nevertheless competitive, market situation. After this major activity, new brand shares were established and the market became stable again.

Brand share stability in a product category can be tracked by market share changes (period to period or year to year) for the various products, or services, in the market. If a brand lost 5% share in one year but gained 5% the next, over the two year period the total change would be 10% and the average 5%; let us use this as a measure of stability. The net change in this example would be zero, of course, but we are interested in degrees of change within a period, during which time media weight tests might be run.

In the toilet soap market, for instance, the average amount of brand share change over a five year period, for five major brands was of the order of 0.51%, nationally, derived from Adams (1973) 1596.

Some other figures for average brand share changes are presented in Table 1, derived from Samuels (1971) 55.

<u>Product Category</u>	<u>Average Annual Brand Share (%)</u> <u>change</u>
Washing-Up Liquids (3)	1.8
Household Cleansers (4)	2.9
Fruit Squash (6)	0.7
Toilet Soaps (7)	0.7

Table 1. Average annual share change per brand (1966-68)
 Midlands TCA Area

An important consideration is whether the average figure over all brands is masking large changes in individual brands. This would not seem to be the case generally, as instanced by the figures in Table 2: annual average brand share changes over 5 years for the major toilet soap brands, taken from the source cited earlier (Adams).

<u>Brand</u>	<u>Annual Average Market Share change</u>
1	0.16
2	0.74
3	0.64
4	0
5	1.02

Table 2. Annual average market share change over 5 years
for national toilet soap brands

Proposition ii) Changes that may occur are too small to measure

A second reason why media tests rarely work may be that changes which do occur are generally too small to be reliably measured by normal sales audits or consumer surveys.

Although for many packed goods the general level of brand shares may not vary much from year to year, the importance of those small changes that do occur must be considered. An increase of 0.5 percentage points in market share in the toilet soap market nationally per year is worth in excess of £40,000 p.a. Nevertheless changes equivalent to this magnitude in brand share from period to period have to be regarded as small because they are often too small to measure accurately!

Variations in brand shares from period to period within a year often vary much more than shares assessed annually. However, there are many reasons discussed in Part B, why advertising weight tests are, and should be, conducted over periods of many months and not in the short term. The problems of detecting short term changes would be even greater, as illustrated next.

Nielsen sales audits, for example, generally cannot reliably measure bi-monthly share changes of less than 0.5%, at the 68% 'level of confidence'.*

This 'level of confidence' is a statistical measure of the degree of certainty that the answer is correct: at the 68% level, one out of every three times

*Suggested by A.C. Nielsen in correspondence.

that it was assumed a real change had occurred would be a fallacious assumption - pure chance would have thrown up the measurement, not a real change in overall level at all. Consequently quite a degree of risk would be attached to any decision based on the assumed correctness of such a measurement.

If sales volumes are measured rather than brand shares, on a national basis, the margin of error of a period-to-period change on Nielsen grocery audits may be between 2-4%, at the 68% level of confidence.* In other words, unless a sales volume increase, or decrease, of at least 4% occurs, nationally, from one period to the next, it cannot be detected on Nielsen's normal audits.

The above figures for accuracy are only a very general guide and should not be taken as absolute. The actual accuracy of Nielsen and other audits, are difficult to calculate and the level for any particular product very much depends on levels of distribution. The figures quoted would be average for a product with reasonable distribution (e.g. 70-80%).

This is not to suggest that Nielsen, or any other audit based on sampling procedures is not worthwhile for the main purpose for which it is intended. However, the accuracy of measurements in a single area is much less than the national level and must be taken into account. If greater accuracy is required for a special purpose then sample sizes can be increased.

Methods of calculating required sample sizes for measuring to certain limits of accuracy are given in Part C of this report. It is worth noting here, though that to double accuracy one usually has to quadruple sample size.

To further illustrate the problem of accuracy of measuring changes in the market, one could consider ad hoc consumer surveys that might be conducted as part of a media weight test. They are probably even less sensitive to small changes. If one supposed that changes in the proportion of people buying a product could be assessed by a simple question (say 'brand last purchased') then it would need a sample of approximately 6,000 product category purchasers to reliably measure a sales change of the order of 0.9 share points. By 'reliability' one usually means to be right in one's assumptions 95% of the time. A sample of 50,000 would be required to detect a change of 0.3%!

*Indicated by A.C. Nielsen in correspondence.

Table 3 illustrates sample sizes required for various levels of change in share points. The actual method of calculation and assumptions used are given in Appendix A.

<u>Proportion of Sample who are users of product category (%)</u>	<u>Change in share points to be measured</u>			
	<u>0.1</u>	<u>0.3</u>	<u>0.9</u>	<u>2.7</u>
10	1,000,000	500,000	60,000	7,000
100	100,000	50,000	6,000	700

Table 3: Required sample sizes to reliably detect levels of change

For products with anything but high penetration one can see the large size of sample required to detect small changes. Surveys of these sizes are rarely undertaken for any purpose let alone for media weight tests.

Proposition (iii) A change in media weight is probably not the only factor influencing a change in the test area(s)

It is extremely difficult to control all elements in the market mix in both test and control areas so that the only difference between them is the weight of advertising.

Such factors as price, in-store promotions and distribution may be particularly difficult to control in the grocery market between different areas. These are just some of the factors that can also influence changes in market performance of a product during a media weight test. Consequently any change that does occur in a test area may only be partially due to advertising. Given that over a year changes in brand share may be very small anyway, changes wholly traceable to advertising effects alone will be even smaller. In the example of toilet soaps one could surmise that price, promotion and advertising affect share change and that these effects were additive. Hence the degree of change, due to advertising, in brand share over a year for an average brand would be only $0.51/3 = 0.17\%$

This argument could be developed further in an extreme situation: any advertising activity consists of three factors - the content (message execution), the media used, and how often it is displayed (media weight). Only the cost factor is examined by a media weight test. If the first two were not strictly controlled between test areas and normal areas, some of the change in market share measured in the test areas could be due to them also. Hence in the sample of the toilet soap market the change in brand share due to media weight could be only $0.17/3 = 0.054$. This is way below a practical level for measurement.

It must be stressed that this is an extreme example but it does emphasize the possible implications of not paying careful attention to controlling strictly, all possible influences on market performance in the test and control areas.

Proposition iv) It is not always easy to make a change in media weight big enough to be markedly different than normal

Doubling advertising expenditure does not double advertising share

In competitive markets, particularly for established products, advertising for one brand or product has to compete with that for similar goods. The share of total market advertising achieved by a particular product is seen often as the important determinant of the potential effect of advertising for that product. Hence often in media weight tests it is an increase in share of advertising that is being tested, rather than the effect of an absolute increase.

To illustrate the difficulty of making a marked change in share of advertising in some cases, assume a product is one of eight in a large market in which total media advertising is £4m. Suppose the total advertising in one area of the country is £800,000 and the product contributes £100,000 of this and intends increasing its expenditure by 50% for a six month media weight test. Its share of advertising before the increase would be $12\frac{1}{2}\%$ and during the six monthly test it will be $18\frac{3}{4}\%$. However, over a full year the increase in share would only bring it to a 15.6% share.

Again, a somewhat extreme example has been used to illustrate the point. However, a 50% increase in expenditure for an individual product is sizeable and a year is probably necessary in many cases to allow for the full effects of any changes to become apparent.

It is believed by many that the sales levels achieved by established brands reflect both current and past advertising levels. In consequence, a large increase in current spending over a relatively short period may not stand out against both past and competitive advertising weights.

Proposition v) Variations due to other market parameters both between areas and within individual areas are often not known or else too large to allow the detection of changes due to media weight tests.

The natural variations that exist between areas are often not known accurately and tend to be ignored, e.g. some regions have better sales than others during the summer because of holiday-makers. One way of overcoming this difficulty is to make the media weight test involve as many different test areas as possible, i.e. replicate the experiment so as to calculate an 'area effect' as well as a 'media effect'. However, it is hard in the U.K. to isolate many experimental areas, let alone manage controlled experiments in each of them.

Even when differences are known to exist between areas it is not always easy to take them into account in evaluating the results of a media weight test: is a larger increase in a 'good' area due to a developing trend there or to the effects of a media weight increase?

There are many possible marketing characteristics that differ between areas which are likely to make interpretation of media weight differences between areas very problematic. For instance, the market share of a product in one area might be 10% and in another area it could be 15%: consequently it could be argued that a 50% increase in advertising in the first area may have a greater effect in the first area than in the second, simply because the potential is greater.

Sources of change in the market due to factors outside the control of the individual company, are often as likely to affect measures of a product's performance as are changes in media weight. Examples of such factors are competitors' activities, the weather and Government influences on the economy.

A further influence on the degree of change likely to be brought about by a change of media weight is that of previous advertising. Diagram 1 illustrates the sales level of a product in a test area, in which all media advertising was stopped for 18 months and the sales level in the rest of the country, where advertising was continued (after Davis (1972) 684)

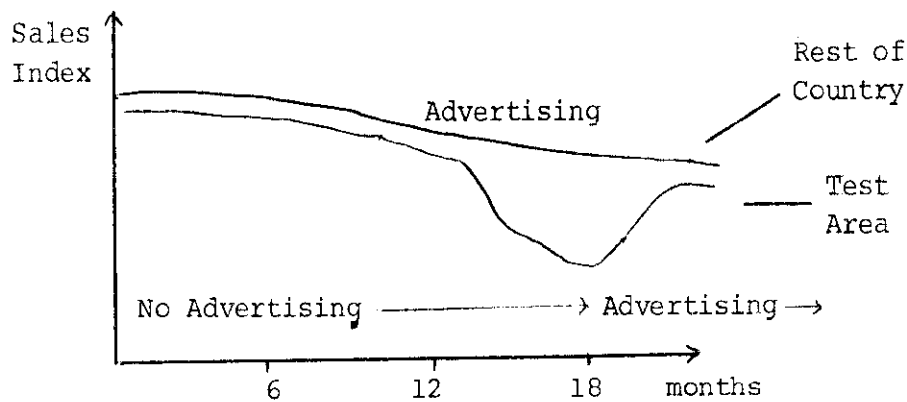


Diagram 1. An illustration of the limited effect of withdrawing media advertising

This example highlights two further considerations in media weight testing. Firstly, some tests involve reducing the media spending to zero in an area while increasing it in others: it can be seen from the example that because of previous advertising in the test area it may be a very long time before the effects of a reduction can be detected in sales levels. Secondly, if advertising had been re-introduced into the test area in the 15th month its effect might have been different because of the higher starting point in the level of sales.

Proposition vi) Marketing experiments, or tests, of one factor alone, do not allow for important interaction effects.

Diagram 2 depicts the situation where initially the advertising expenditure on a product is increased for a trial period in an area with no effect on sales level. The advertising experiment is curtailed and distribution levels are next enhanced over a period but again with little effect. It is only when both advertising and distribution are increased that any change starts to emerge in the market.

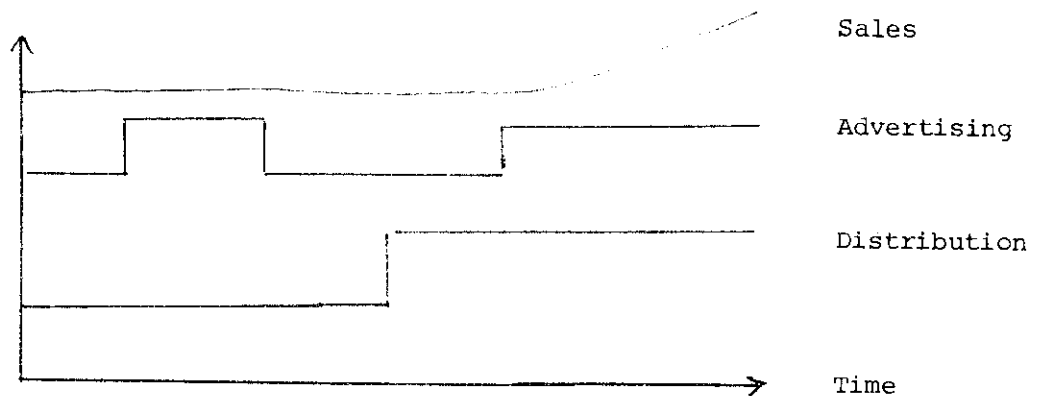


Diagram 2. An illustration that an increase in advertising weights may need a complementary increase in another factor before any effect takes place

This illustration highlights the fact that media weight tests may, or may not, cause discernable changes in the market due to the level of other strong influences existing at the time of the test. Another important effect not discernable on a single factor (media) test is that of the changing degree of influence asserted by other influences. For instance: for a 25% increase in media weight, a 5% increase in distribution might cause a 2% growth in sales; for the same increase in media weight and a 10% increase in distribution sales might grow by 6% i.e. a more than proportional increase. Comprehensive, extensive experimental designs must be used to detect interaction effects.

Proposition vii) It is debateable what to chose as the appropriate base level against which to measure a change in market performance

When one is conducting the measurement of the effect of a media weight test, be it on sales levels, awareness or attitudes, one has at least three choices of reference point for judging change. Is the most appropriate measure the absolute increase achieved, the increase relative to the pre-test level or the absolute increase as a proportion of an estimated maximum potential increase.

For example: before a media weight increase in an area the percentage of the target population preferring a product was 30%; after the increased media weight test, this figure increased to 40%. Measures of change could therefore be:

- i) $40 - 30 = 10\%$,
- ii) $10/30 = 33\%$,
- or, iii) $10/70 = 14.3\%$

Conclusion

In this section some of the conditions necessary for media weight tests to produce measurable, conclusive results have been critically examined. Seven propositions have been stated each of which assert, with illustrations, that it is unlikely that a simple media weight test will produce a meaningful, measurable assessment of the effect of different levels of media spending on the performance of a product or service in the market place.

All seven assertions taken together would indicate that it is highly unlikely that a simple media weight test can produce a meaningful, conclusive result for sales or brand share measures have been primarily considered in this section as the evaluation criterion. It must be remembered, however, that attitude and awareness measures can change with a much greater magnitude during media weight tests.

PART B THE CONCEPTUAL AND MANAGERIAL REASONS WHY ADVERTISING
MEDIA WEIGHT TESTS ARE OFTEN LIKELY TO FAIL

Introduction

In the previous section some underlying statistical and often quantifiable difficulties associated with the principle of conducting media weight tests were considered. In this section the managerial role in media weight testing exercises will be probed to expose and illustrate difficulties which may arise in making decisions on them.

There are decisions to be considered for three general phases of a media weight test, which are:

- i) clearly defining the purpose and objectives
- ii) setting-up and controlling the exercise
- iii) interpreting results and findings

Important considerations which must be taken into account and resolved at each phase of a media test are detailed next in this part, under each of the three categories cited above.

i) Purpose and Objectives

Before any media weight test is conducted it must be established clearly for what purpose it is being conducted. Everything stems from the overall objective. Similarly it must be clear to all involved in setting the objectives what a media weight test is likely to achieve so that appropriate, realistic objectives may be set.

It must be realised that in most circumstances, if answers to a particular advertising problem are required quickly then it is not practical to resort to media weight tests. This is because of lengthy set-up times and, as mentioned in Part A, the lengthy running times required for such tests to show up any effects.

The importance of clear objectives for a media weight test is that they help define:

- a) the type of experiment that should be conducted
- b) the extent of the information that must be collected before, as well as, during and after the experiment.

All too often media weight experiments are inconclusive because insufficient information is available, since due consideration has not been given to defining the precise purpose of the exercise and establishing information needs.

It has been also remarked, by Cooke (1966) 992 that:

"the use of experiments to marketing management is only any good if they allow prediction"

In other words, if a media weight test is run to ascertain the right level for advertising in a forthcoming campaign the results of the test must be capable of projection into some future time period and set of circumstances. If this is the case then the objectives of the test must include this factor so that sufficient information on such things as trends can be tracked over a sufficient time period.

Finally, it may be very important to discover some indications why a particular result is achieved in a media weight test. If this is the case, this requirement must be part of the objectives of the exercise. For example, if a media weight test is conducted for a new product in a new area to examine resultant sales levels, certain other data would have to be collected to help explain why a particular level was achieved. In this case distribution, attitude and awareness information would be also required, to take just three examples.

ii) Considerations in setting-up and controlling media weight exercises

One of the first problems to be considered is that of competitors' activity during a media weight test. Are they likely to respond, once they realise an experimental level of advertising is being examined, and will this invalidate the test? If the answer is 'yes', then either

a) the test should not be run,

or b) a more sophisticated design of experiment should be used

The simple test, where advertising weight is increased in one area alone and then compared with results in the rest of the country is very easily disrupted by competitors. A test design involving different levels of change in advertising weight in different areas is both more likely to produce useful information and is less easily disrupted by competitors.

As soon as one considers reducing advertising weight in some areas as part of an experimental design one must consider the implications of this on company performance and company personnel in the areas of the reductions. In companies where marketing and sales personnel have clear, short term objectives it is often difficult to reconcile experimental objectives and criteria with operational ones. Consequently it is often difficult to restrain operational management from making compensatory adjustments, in other marketing pressures, for reduced advertising activity. Similarly, where advertising is increased there is incentive for personnel to capitalise on this good fortune. Bonuses and retailer/distributor goodwill are some of the considerations that are likely to make operational management not conform, either consciously or unconsciously, to experimentally required levels of activity.

Mention is made by Burdus (1969) 725 of how an advertising weight test was invalidated completely by the activities of one person in the organisation who did not know of the experiment being conducted and 'took action'.

Another problematic decision required in the setting-up stage of a media weight test is that of selecting appropriate areas for the test. Much has been written to assert that no one area of the UK is completely representative of the whole country. This is not necessarily an insurmountable difficulty if due consideration is taken beforehand of the potential problems of the interpretation of results, and information is gathered to allow for compensations to be made.

There are often reasons for not choosing 'average' areas for the test changes in media weight. 'Average' areas may be least informative. For example, a convenience product may sell well and be well thought of in southern regions while not performing well in northern ones. It would be much more informative to conduct a media weight test in typical southern and northern areas than in an 'average', in-between area since the latter would not be typical of either.

Another important and practical consideration is that of the cost of media in different areas. Because of very different cost/1000 rates from area to area, particularly on T.V., an extra £50,000 on media advertising in one area would achieve more, in exposure terms, than in another area. This may pose problems in the interpretation of results of media weight tests and so must be considered at the design stage. Due allowance must be made for changes in advertisement costs from area to area, particularly where a company allocates its advertising monies on an equal impacts basis.

The value of 'replication', or repeating the test in **several** areas at once, was outlined in Part A. An illustration is shown in Diagram 3 of this value of repetition.

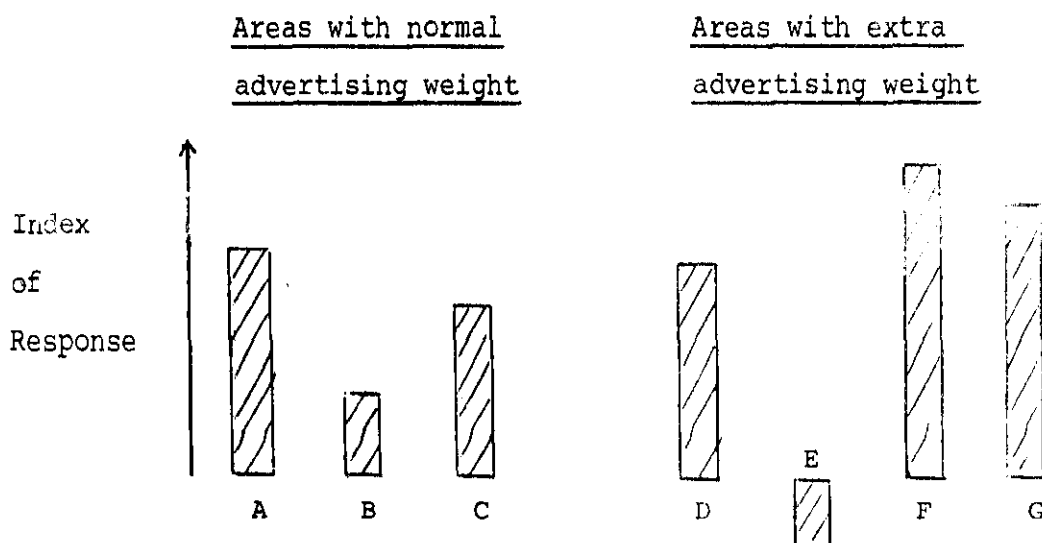


Diagram 3 An illustration of the value of repeating tests
in several areas - one extreme result can be
seen as such

The experiment consisted of retaining normal levels of advertising in 3 areas (A,B,C) while increasing it in 4 others (D,E,F,G). The diagram shows the relative performance of the product in each market (in sales, or attitude terms). It can be seen that if the extra weight of advertising had only been applied to area E, a fallacious result would have been obtained as to the general effect of increased weight of advertising. The value of the repetition also would enable area E to be seen as requiring much further examination which is likely to be valuable.

Another practical problem to be faced if a media weight test involves increasing the frequency of advertising is that of quicker 'wearout' of the advertisements used. Increased media weight can be translated into more frequent advertising during a normal campaign length or an extended campaign length. The former situation might give rise to a perceived need for a greater number of different advertisements during a campaign to guard against possible boredom in the target audience. This immediately introduces a comparability problem between the test area and those areas receiving a smaller number of advertisements.

A further decision has often to be made on media allocations when media expenditure is either increased or decreased: should advertising expenditure remain allocated in the same way as for normal levels? It might be felt more 'effective' to additionally use another medium if expenditure is increased in a test situation, or to drop the use of one if expenditure is decreased. Again the attendant problems of comparability between test areas and unchanged areas must be resolved.

A final area of concern at the design stage is that of data and information acquisition. If this is not going to be adequate for financial or other reasons, it really goes without saying that the test should not be conducted. It is better not to have a result that is a misleading one. The money set aside for a test can be used to conduct more constructive research in this situation.

Some companies do not have the facility for their sales or delivery data to be analysed by special areas. Where they normally rely on this sort of information to monitor market response, they will have to set up an independent data collecting mechanism if media weight tests are to be run in special areas, since the conversion of sales area figures to TV areas, for example, is usually too inaccurate to allow the effects of changed levels of media spending to be detected.

(111) Interpretation

There are usually several problems of interpreting the meaning and implications of a media weight test which occur after the initial results have been determined: some could have been avoided often during objective setting by clear statements of what precise questions were required to be answered by the test.

In this section a series of problems that have occurred or been posed about interpreting media weight test results are reviewed and discussed. It is hoped that this listing will enable some potential media weight testers to incorporate some of the considerations into their test designs, while enabling others to check the rationale of their test.

As mentioned in the previous section an experimental finding often must be projectable into the future for management use. Hence, for example, if a test were run where advertising frequency were doubled and a certain, favourable outcome measured in the market; management then implemented this double frequency policy, or some fraction of it, but then their competitors also increased their frequency. What advice about the outcome or wisdom of adopting the experimental results could the researcher give, based on one such experiment? In Part C guidelines for tackling this sort of problem are suggested.

The role of advertising for different products in the market must be considered sometimes. The purpose and objectives for advertising a fairly new product are usually different from those of an older, well established product. Consequently, the results of a media weight test on a fairly new product in a market must be seen in the context of the newness of the product: the results may not be applicable to an established product in the market. In other words, the apparent advantages of a higher level of advertising may only be temporary: when the product becomes an accepted, established one and is advertised to retain share, rather than gain it, the way advertising works will probably be different. Hence the time span over which results from a media weight test may apply must be considered relative to the situation of a product in the market and the activities of other products.

The consideration of effects on new and old products introduces again the problem of how long a test should be run before the full magnitude of any effects can be seen. As Segnit and Broadbent (1970) 148 have commented, based on wide experience of media weight tests:

"Our experience of increased weight tests for established products confirms the traditional belief that increased spending usually produces in the short term comparatively small effects"

An approach to solving this sort of problem, elaborated in Part C, is to either make estimates of the length of time necessary, based on other research or to resign oneself to having to wait an unknown length of time. The value of knowing the likely, full effect of advertising weight changes, as opposed to a partial result, must be evaluated against the cost of running a lengthy test, if the second course of action is envisaged.

Other more elaborate media weight experiments involve both increasing and decreasing media expenditure to attempt to establish the relationship between expenditure and response in the market place. It is then hoped to produce the sort of graph depicted in Diagram 4 (a), for future guidance.

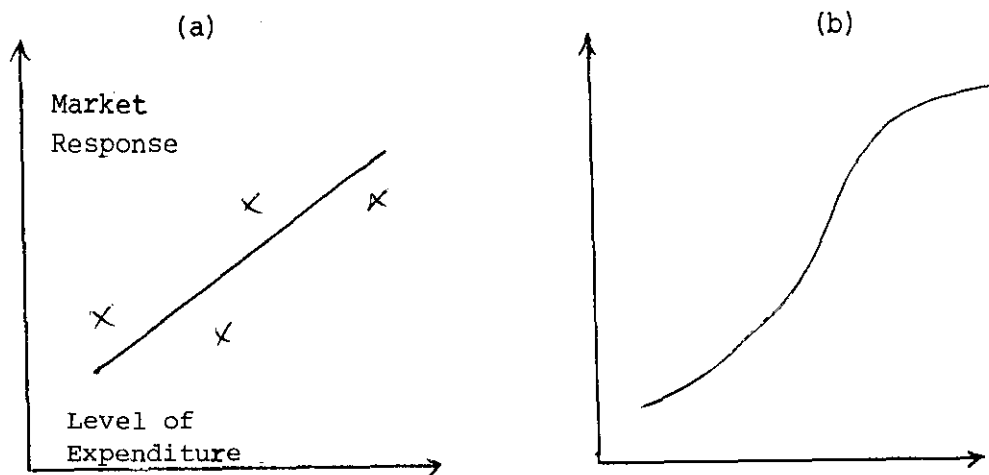


Diagram 4 (a) An example of the sort of result some media weight tests are hoped to produce, and
(b) relationships thought to hold by many

These experiments do not always seem to take into account the beliefs, and some evidence, that reducing advertising expenditure by a certain amount will have a differing effect to that of increasing expenditure by the same amount. If it is true that relationships are not linear, then it becomes difficult to extrapolate findings from a media weight experiment outside the ranges used in the experiment. It will even be difficult to interpolate expected results for values of expenditure between those used in the experiment.

Diagram 4(b) illustrates the form of relationship thought to exist in many researchers, admittedly on limited evidence.

Two final observations need to be made in this section concerning the limited use to which the results of media weight tests can be put in other marketing analyses.

Quite rightly, in many media weight tests the 'effects' are not measured absolutely but rather the extent of change is measured relative to a norm. The norm usually chosen is the performance of sales, or attitudes or whatever, in an area designated to have a 'normal' level of advertising and to behave normally during the test. It is important for any future and wider use of the test findings that 'normal' be defined and recorded comprehensively. A test increase in media weight in one area might show a certain level of improvement compared to a normal, or control area but the findings could not necessarily be immediately applicable to other areas which differed substantially from the normal, or control area. Consequently, if a test is run and the results are required to be applicable nationally it must be designed to relate to the national situation.

It must be remembered always that the effect of media weight is not independent of other marketing activities. Consequently, if it is found by media weight test that a 10% sales increase could be achieved by a certain media weight increase, this will not necessarily happen when it is implemented particularly if other changes take place in the marketing mix, even if these changes are favourable! For example, it might be found that a 20% increase in media increased sales by 10% and a 15% increase in distribution also has increased sales by 10%, in another test. Implementing both the media and distribution increases might not increase sales by 20% because of the diminishing returns situation that exists in most markets, i.e. it might be possible to gain a 10% increase by either course of action but become progressively harder to gain more above this level.

If 'synergy' is defined as the total effect being greater than the sum of the parts, the situation cited might be termed as one of an 'anti-synergy'.

PART C THE IMPLICATIONS FOR MEDIA WEIGHT TESTING; GUIDELINES FOR SUCCESS

Introduction

The purpose of the first two sections of this report were to explore the reasons for the frequent failure of media weight tests to produce conclusive findings. Both some fundamental properties of the system being tested and managerial reasons give indications that it will be difficult to obtain meaningful results in many instances.

Having identified some of the reasons, causes and problems associated with this failure, this section will present some guidelines to help formulate more fruitful media weight test exercises, where they are appropriate.

The section is divided in three: the first part states some major assertions which must be considered at the outset of any proposed media weight test; in the second part, practical ways of dealing with various problems are considered; and, in the third part a check-list is presented to summarise the points that must be considered when undertaking media weight tests.

Major considerations

It has been demonstrated in this report that there are many difficulties, both statistical and managerial, in conducting successful media weight tests. Given that this is the case and that such tests can be expensive both in time and advertising money, management should be very careful before embarking on such exercises.

There are given below some points which need major consideration when media weight tests are discussed.

a) Establish the objective of the exercise clearly

What problem is a media weight test hoped to resolve? Is a media weight test the most appropriate solution method? Is there sufficient managerial and technical skill available to successfully conduct the exercise?

The overall objectives also define what aspects of the market should be measured in order to assess the effectiveness of the media weight change. If it is intended that advertising should stimulate sales over the test period, then sales should be measured. If they cannot be accurately measured in the market, clear findings will obviously not emerge. If the purpose of advertising is to stimulate a changed perception of the product then this should be measured as clearly as possible.

These are some of the fundamental considerations necessary to be resolved at the outset of an exercise.

b) The expected effect of advertising weight change must be estimated beforehand

This is a very well worthwhile exercise in that it forces consideration of the practicality of the exercise and an awareness of the total problem and the many influences on the outcome. Without this estimate, however, it is impossible to design a test that can efficiently establish results.

There are two main ways of estimating potential changes. The first would stem from experience of the market and a consideration of such things as: the level of changes common in the market; the state of the market, e.g. competitive, with lots of promotions and deals, or relatively inactive, with no major changes recently. The second approach to forecasting changes would involve estimates based on econometric analyses of past advertising activities; this is considered in further detail in the next section (page 29).

Where other factors in the marketing mix are going to be changed during the test, either intentionally or because they cannot be controlled, their effect must also be estimated beforehand. This determines the accuracy to which measurements of the effect of advertising weight must be taken.

Realistic goals and estimates must be set. If the total market or market share are trending downwards, hopes should not be pinned on a miraculous upswing due to a media weight boost. In this situation a maintenance of the current position might be all that can be expected.

- c) The study should be designed to be sensitive to the expected effects of changed media weight

This is a technical consideration and expert advice should be sought if necessary. Sample sizes and the period over which measurement is conducted must be sufficient to reliably measure changes in the market of the expected order of magnitude.

- d) Conduct the test over a considered length of time

The preliminary estimate of the effect of changed media weight should include the determination of the period over which this effect is likely to emerge. A media weight test should not be run over an arbitrary period. One guideline is that if campaigns are normally a particular length and the results of the test are likely to be applied to normal campaigns,

then the test should be of campaign length.

It is often not realised that media weight tests are being conducted with the null hypothesis that the test campaign weight and the normal weight will produce no difference in effect : measures are taken during an arbitrary length media weight test to see if findings do indicate any difference, i.e. disprove it. If differences have not appeared by the appointed terminating date of the test the whole exercise is deemed a failure or, at best, inconclusive. If the starting hypothesis were that there was a difference in effect due to media weight, the test would be run until the difference emerged over the expected period for emergence, or the hypothesis substantially disproved.

Conclusions

The overall tenor of this report so far and of the four points listed above is to suggest caution, and careful consideration of the use and likely value of media weight tests. This is not to suggest that media weight tests will always be ineffectual. Indeed where substantial effects can be expected over a reasonably short period of time and off-take measurement is feasible and accurate, there is every chance of success. Often these circumstances are found in rather individual product or market circumstances, e.g. new products; products in markets where there are very few major competitors; product fields where there is normally a very low level of media advertising. Although the test itself may produce measurable results in these circumstances, some care must be paid to the interpretation of them, as outlined in Part B.

In the situation where it is not clear whether a media weight experiment will produce a clear, unequivocal result some people advocate undertaking the exercise for the experience, i.e. experience derived from a factual basis rather than repeating the same procedure right or wrong many times.

In this case wider objectives should be set so that as much as possible is learnt about marketing the product. This will almost inevitably mean more extensive information gathering procedures will have to be set in motion to help establish why certain things either happen or do not materialise.

Overall it can be concluded that media weight experiments should not be seen in isolation from other marketing development activities. Results from experiments, be they media weight tests or whatever, are most valuable when they provide further information on the establishment of theories of how the product performs in the market. Hence media weight test results can provide information to the more fundamental exercise of understanding the dynamic effects of advertising and the contribution of advertising to the total effect of the marketing mix, where companies have established such theories. Therefore media weight tests should be conducted as part of an overall, long term programme to understand the processes of marketing the product, and not as an ad-hoc exercise to be interpreted in isolation.

Guidelines on some aspects of conducting media weight tests

Books

A good handbook on experimentation in marketing in general is by Banks (1965) 1014, while a monograph by Cox and Enis (1969) 1015, contains a basic methodology, many examples and sufficient references to enable the planning of experiments to be technically correct in many situations. Another sound book on the subject of experimentation in marketing is that by Davis (1970) 1016, which offers many practical insights, both for the manager and researcher. A good technical summary of the designs for media weight tests is the paper by Hoofnagle (1965) 326.

Further references to other useful books and papers on this subject are quoted at the end of the report.

Basic Methodology

There are two ways of examining the effect of media weights on the market. One is via an analysis of historical data and the other is via controlled experiments. By historical data one means information which is taken as it comes, with no attempt or opportunity to control the circumstances under which all of the pertinent factors are measured. Generally speaking conclusions have to be drawn very carefully from the historical analysis approach as it is not usually easy to discern the time effect of only one factor. Another qualification which is sometimes even more important is that historical information is usually incomplete. Some relevant factors may not have been measured or recorded at all, simply because records were not kept for the purpose of systematic analysis. Finally, an inherent limitation of any statistical analysis based on historical data is that some values of the factor of most interest may not have occurred in the past.

The way of overcoming the limitations of historical information is to plan and control the conditions under which information is collected. In a designed experiment an attempt is made to identify all the factors affecting a given variable under investigation (e.g. sales, share or attitudes). As far as possible these factors are controlled i.e. they are either held constant while one of them (e.g. advertising weight) is varied, or they

are deliberately manipulated in a planned way, which allows calculated analysis afterwards of contributing effects.

It is with the above purpose in mind that media weight tests, or experiments, should be planned.

Media weight tests can be designed to cover several geographical areas or a variety of towns. As stated before, the more extensive the test the fuller is the information and chance of a successful outcome. The extent of the test is governed by the financial and management capability for conducting tests.

If A represents one level of media weight and B represents another level, various common experimental designs can be summarised below. The figures in brackets represent different areas in which A and B levels are used :

Before and after test: A(1) v B(1) (measures taken in an area before and after media weight is changed)

Single areas: A(1) v B(2) (results in area 1 compared with those in area 2)

Multiple areas:
$$\begin{pmatrix} A(1) \\ A(2) \\ A(3) \end{pmatrix} v \begin{pmatrix} B(4) \\ B(5) \\ B(6) \end{pmatrix}$$

Crossover:
$$\begin{pmatrix} A(1) \\ A(2) \end{pmatrix} v \begin{pmatrix} B(1) \\ B(2) \end{pmatrix}$$

Although multiple area designs are most efficient from a theoretical point of view, the limited number of different regions, for advertising purposes, in the U.K. restricts the possibilities severely. Another limitation is that theoretically areas should be selected for different weights of advertising randomly. Often practical considerations make this infeasible. Tests done on several areas do also put a large number of consumers at risk should the trial levels of advertising have an adverse effect, or experimental

control of other marketing pressures allow competitors to take the initiative.

Where several areas are to be used for a media weight experiment the "Latin Square" design procedure is usually adopted. This is described fully in the books and papers quoted at the beginning of this section.. A very useful variation on this design is the "double changeover" technique. This permits the calculation of the carry-over, or residual effects of changing advertising levels in areas during the experiment. Several examples of this design are given in Cox and Enis (1969) 1015, and Hoofnagle (1965) 326.

Correcting for Area Differences

One of the difficulties in setting up media weight tests cited earlier was that no two areas of the country are alike. Therefore it is difficult to compare the effects of media differences between them because the starting conditions are not alike. For example, a product might have a 10% share of the market in the test area whereas in the rest of the country the average might be 15%. The result of increasing media weight in the test area is therefore not directly comparable with that in the rest of the country.

Similarly, prices or levels of distribution can vary from area to area and cause difficulties with true comparisons of advertising effects.

Covariance analysis can be employed in such cases to "correct" for such area differences. The methodology used is fully documented in the book by Frank and Green (1967), 1627. Basically what is required in these situations is the bringing of all measurements of the effect of media weight in different areas to a common base level for comparison. For example, diagram 5 depicts the hypothetical results from an analysis of a media weight test situation where it was found that in each area the brand share after the test was related to the level of distribution before the test. From the graph it is possible to correct the test results to a common level of distribution at the start for comparison of media weight effect. The figures in brackets depict the different areas.

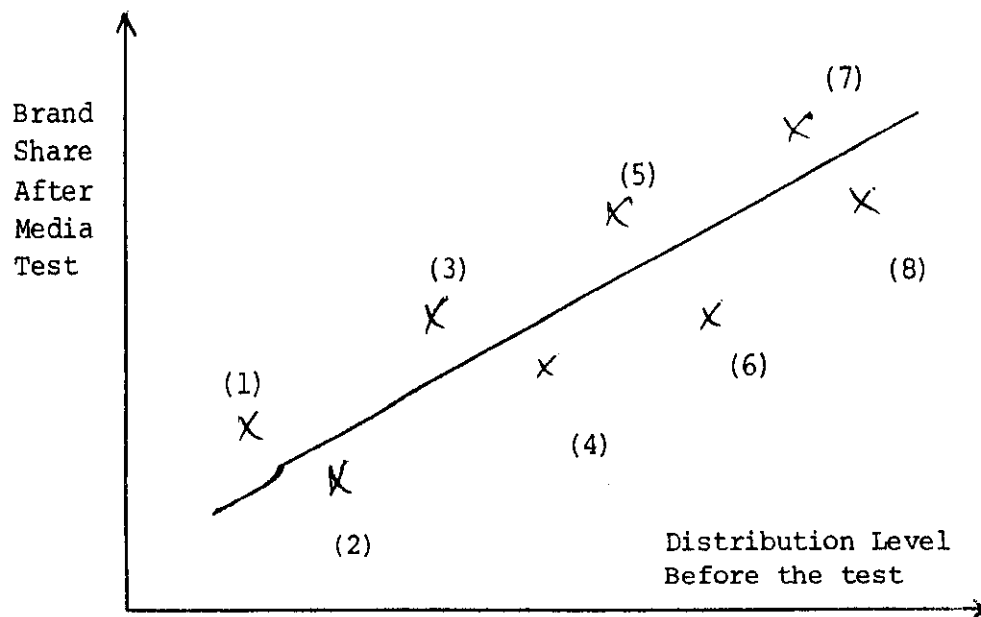


Diagram 5. An example of relationships found between starting levels of influencing factors and the results of media weight tests.

A Long term fundamental approach

A media weight test, like any other form of analysis, should be based on some model or conception of the problem or process which is being studied. Hence it is strongly advocated that for a media weight test to provide meaningful information in the long term to marketing management, it should be part of a programme of research, not an ad hoc, independant study.

Before any media weight test is undertaken a thorough exercise should be carried out on existing information to derive how it can be expected that changes in advertising weight will affect those aspects of the product one is concerned about. Hence one is advocating the construction of marketing models, embracing the consideration of the major factors which affect the performance of the product in the market place. The possession of such a model can predict, although not necessarily precisely, the degree of change expected for a change in media weight. The time over which this change can be expected to take place can also be predicted. Estimates of these two

quantities then allows the design of an appropriate media weight test to be considered. Without these two estimates, as stated before, it is chance whether a media weight test will show a significant outcome.

The construction of marketing models, including such considerations as price, distribution, the weather and economic influences, is a lengthy exercise in itself and needs to be updated periodically. Such models are rarely completely adequate in themselves for representing markets but with the added input of experimental testing of predictions from the model, they become an extremely useful marketing tool. This subject is elaborated at length in Report No. 2(ii) by the MCRU, "Apost-display analysis of promotional effectiveness".

Sample Sizes

Given that an estimate of the likely effect of a media weight change is available, it is then possible to estimate the sample size necessary to detect this change, to the required degree of accuracy. Examples of sample sizes for various levels of brand share change and penetration were given in Table 3. (Page 7).

The formula quoted below enables sample sizes to be calculated to the right order of magnitude. Because there are many different situations that have to be taken into account, such as type of sample - stratified, quota etc. - the derivation of a precise sample size is a technically involved procedure and will not be elaborated here. Expert advice should be sought always. Books of use for this activity are: Moser (1958) 1628, Parten (1950) 1629 and Kish (1965), 1630. Other references are given at the end of the report to books containing the necessary statistics.

To determine the necessary sample size of individuals (n), for measuring a brand share (B) to within \pm a specified accuracy (r) the following formula can be used.

$$n = \frac{K^2}{r^2} \cdot \left[\frac{(100 - B)}{B} \right] \cdot 10,000$$

In the formula $K = 2$ or 3 , depending on whether one wishes to be 95% or 99.5% sure that the result one measured by the sample is certain.

An example illustrates the use of the formula. Suppose that it is believed that an increase in media weight over a specified period will achieve a brand share of 40% in a test area; because of known variation in brand shares it is necessary to measure the actual brand share attained to within 4%. The marketing management are prepared to accept a result at the 95% level of confidence.

Thus:

$$K = 2, \quad r = \frac{4}{40} = 10\%, \quad B = 40$$

$$\text{and so, } n = \frac{4}{100} \cdot \left[\frac{(100 - 40)}{40} \right] \cdot 10,000$$

$$= 600$$

In other words, 600 independent individuals would have to be used.

Some additional remarks are necessary to clarify the use of this formula. Firstly, the formula is strictly applicable only to simple, random samples. Sampling systems which are more efficient statistically require fewer observations for equally satisfactory results. Secondly, the formula relates to the sample size needed for one particular characteristic of interest. Usually surveys are conducted to measure several characteristics and so compromises have to be made and some measures are made with less accuracy than others. This also raises the point that for store sampling it might be more important to measure achievements in chain stores more

accurately than in smaller volume, independent ones, and simple random sampling would not be appropriate.

The kind of sample design that should be used in before-and-after studies, which are particularly common in media weight testing, is one given careful study by Ehrenberg (1965), 1631. The problem is whether to interview two independent samples or to make recalls on the initial sample - the panel type of operation.

"Suppose for simplicity that we are dealing with a simple yes/no variable, such as buying/not buying a brand or knowing/not knowing a brand name. The panel method will give a more accurate estimate of the trend in the proportion of yeses from before to after than if two independent samples were used - as long as there is a positive correlation between responses before and after".

Given that problem of questionnaire design can be adequately overcome, Ehrenberg concludes that, as a general rule, if mainly purchases and the like, are being investigated in before - and - after studies, the panel technique should be used. On the other hand where such things as brand awareness are being investigated and where larger changes can be expected, it is better to interview two independent samples before and after the test.

Recording Information

It is important to remember that it is often desirable to gain some systematic understanding of the reasons for the effect or non effect of a media weight test.

To quote Davis again, on reasons for the failure of marketing experiments:

"The most common failing is that information is either not collected at the right points in the marketing system or else at not enough of them the ultimate assessment of the results will probably be made on the basis of changes in consumer sales Thus some form of measurement of the flow of goods from the retailer to the consumer is required, and for many products this

may be done in the store or in the home. To provide a full picture even of the flow of goods, however, neither measurements made in the stores only nor measurements made on the consumer will give the whole picture. The first will provide no data on the types of consumer buying the product or about the extent of repeat purchasing, while the second will provide no information about the extent of retail distribution or the adequacy of stocks. Thus, even to assess properly the flow of supplies, more than one set of measurements will be required".

It is normally a very useful discipline to keep a 'log book', or diary, on any media weight experiment in which to record all the unplanned events. This can prove invaluable in the short-term analysis of the experiment, for the planning of future such experiments, and for the training of new management.

Advertising Laboratories

In order to overcome some of the objections to experimenting with advertising weights mentioned in this report, particularly the inherent differences between areas, some people advocate the use of an "Advertising Laboratory" or "Ad-Lab"

What is an "Ad-Lab"? An Ad-Lab consists of carefully matched panels of consumers in the same geographical area, usually a town, where the only difference between the panels is that one panel can be exposed to one type of advertising input and another panel can be exposed to a different input. The inputs used in experiments run on the panel can be such things as different advertising weights, different creative treatments and different patterns of advertising. The most common form of Ad-Lab which has been run in the U.S.A. is based on T.V. advertising, latterly via cable T.V. systems. The Milwaukee Ad-Lab, now defunct, was an interesting innovator of the method and included the control of local newspapers advertisements as well as T.V.

The technicalities of setting up such in-the-field advertising laboratories in the U.K. are fully explained and considered in Downham (1973) 1632. At present such facilities do not exist. The advantages for advertising testing of such systems are that because the panels are in the same area, all other marketing influences are constant and one can be reasonably sure that any differences detected between panels exposed to different advertising will be due to the advertising.

The use of an Ad-Lab will not remove many of the conceptual and interpretational difficulties outlined in this report, unless it is part of a total research programme of the model-building-and-testing type.

Conclusion

There are many circumstances where it would be difficult to conduct conclusive advertising weight tests. Where the circumstances are conducive there are many operational problems to be resolved. This report has attempted to set these out in the sequence that they should be considered and present guidelines for accommodating some of these problems. Opposite a checklist is given which summarises the main points for consideration when a media weight test is being contemplated.

A Checklist for considering media weight tests

A list is given below of all points that should be assessed when a media weight test is being considered. All the points listed are amplified in the foregoing text and page numbers are given opposite.

	<u>page</u>
1. What are the objectives and purpose?	13, 23
2. Have realistic goals been set?	24
3. When are the results required, is this sufficient time to run the test properly?	20
4. Have any previous tests been run that can give useful guidance?	25
5. Will results from the test allow prediction?	14, 19
6. What factors are going to be measured to detect effects?	12
7. How susceptible to change are these factors?	3
8. What magnitude of change of these factors is expected to result in the test?	23
9. What is the general variability of these factors in the market?	4
10. Is it going to be feasible to accurately measure the expected degree of change?	5, 25
11. What other factors will affect the result? How controllable are they, and how will they affect the outcome?	2
12. Is the planned level of change in media weight really different to normal?	8
13. Have any previous tests been run in the proposed area?	10
14. What is known about intra-area differences?	9, 28
15. How long will the test have to run to detect expected changes?	10, 24
16. Are interaction effects likely to be important?	11
17. Is it important to know from where the change in the market emanates?	14

	<u>page</u>
18. How will competitors respond? Will this invalidate the test?	15, 19
19. Is there management skill and experience to control the experiment?	15
20. Will company staff react and upset the test?	15
21. Average areas are not necessarily best for tests	16
22. Consider the cost/1000 differences between areas when planning the test	16
23. Consider the value of replication	17
24. If advertising is to be increased, will this necessitate increasing the variety of media and/or the number of different ads?	18
25. Define what constitutes a 'normal' level or area	21
26. Remember an 'anti-synergy' effect may occur on implementation	21
27. Consider the value of the information gained relative to the cost of the experiment; collect as much as possible so that experience is gained.	20, 25
28. Consider that tests or experiments are likely to be most valuable if they are part of a long term research programme	25
29. Keep a diary, or log book on the whole exercise.	33
30. Choose the most appropriate test design	26, 27, 28

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Appendix A

The Calculation of Sample Sizes for the Consumer
Survey example

The determination of the required sample size for a consumer survey of the type suggested in Part A of this report depends on the selection of four specific inputs:

- a) the existing market share for the brand or product
- b) an estimate of the expected change in share due to the media weight stimulus
- c) the proportion of consumers, among the population to be sampled, who are purchasers of the product category.
- d) the "level of confidence" required in the accuracy of the results, which is a statistical measure.

In the example cited in the text and in table 3 the following values have been used:

- a) market share = 15%
- b) expected changes in share are quoted in the table and range from 0.1 to 2.7.
- c) the proportions of consumers who use the product category are quoted in the table and range from 10% to 100%.
- d) the 'level of confidence' used was 95% i.e. the result measured by a sample of the size quoted in the table will be correct 95 times out of 100 such surveys.

The formula used to **calculate** approximate sample sizes is that given on Page 31:

Example: for a change of 2.7 share points

$$K = 2, \quad r = \frac{2.7}{15} = 18\%, \quad B = 15$$

$$\text{and so, } n = \frac{4}{324} \cdot \frac{85}{15} \cdot 10,000 = 700.$$

If only 10% of the population use the product, 7000 would have to be contacted to obtain 700 users; if all are users then only 700 need be contacted.