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FUSION - BRITAIN'S LATEST EXPERIENCE

SUMMARY

This paper deals with the statistical fusion of two large and in advertising and media terms very important databases.

These databases are the Target Group Index which is based upon an annual sample of 25,000 adult self completion questionnaires and the U.K.'s official T.V. audience measurement survey conducted on behalf of BARB (the Broadcasters Audience Research Board). The latter survey is a continuous electronic measurement with a panel which includes some 6,000 adults.

The paper touches on the reasons for the fusion, gives a brief overview of the methodology and provides some results of how T.V. media decision making can be affected by use of the fused database. We than go on to look at some of the implications with regard to readership by examining the readership data carried over from the TGI to the BARB panel and the resultant alterations to the basic penetration and profile information.

The Target Group Index is the U.K.s leading, indeed only, single source product/media database. It is based on an annual sample of 25,000 adults who complete a sizeable self completion questionnaire.

Within the field of Press space planning and buying it is key and indeed currency. However in the area of T.V. negotiation it is of secondary importance even though it is analysable on a T.V. region basis and asks a variety of questions related to T.V. viewing. There are other databases that offer product measurement that operate in this area and historically it has only been necessary for these databases to be segmented in the current geographical (i.e. T.V. region-based) way for them to be usable. Actual spot by spot and campaign by campaign negotiation and evaluation has been done via the common language of demographics acting for the most part as very broad behavioural surrogates and taken from the BARB measurement.

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With the advent of a more segmented audience delivery via both additional terrestrial and satellite/cable channels it has been felt for some time that a higher level of sophistication has been required in order to exploit these new targeting opportunities. Needless to say the lack of necessary finance and entrenched interests have both conspired to prevent a T.V. orientated (i.e. second by second measurement related) single source database. Data Fusion between the TGI and the BARB T.V. measurement system seemed to us to provide an economic and politically acceptable solution and such a fusion came about in the Spring of 1990.

RSMB in the U.K. carried out the work and the important factors to consider when examining the results of the work are as follows:-

1. The algorithm used was based upon Mahalonobis distance measurement which had already been used once before in work carried out by Granada Television in the U.K; work which also involved a fusion to the BARB T.V. audience measurement database.

2. All common variables (see Table 1) - basically demographic and T.V. hardware ownership related - were used in the fusion. Two additional weight of viewing related variables were also used making a total of thirteen common measurements.

3. Importance weights were calculated for each variable based upon an analysis of variance related to the exploration of a selection of TGI and BARB data. Such categories included, from TGI, ones where a heavy/medium/light usage break was available and others where a Yes/No answer had been requested and supplied. The selection of product fields was entirely random and included housewife orientated products as well as durables, cosmetics, finance and leisure activities. No readership information was used from TGI and we shall examine the implication of this later.

    On BARB the selection centred on viewing by daypart and here an additional factor analysis was conducted.

    Apart from confirming that sex should be a critical variable (i.e. men should only ever be fused to men and women to women) this analysis provided us with the list of importance weights contained in Table 2. These weights are derived from averaging the values found across all of the fields examined.

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4.   The direction of the fusion (i.e. which database operated as donor and which recipient) was finally decided by the need to allow the BARB database to fully display the regional vagaries of availability to view and actual viewing levels as well as the requirement to retain the prime measurement currency (i.e. BARB) in an unadulterated form.   Thus the TGI was nominated as donor survey.

5.   As regards the donor/recipient ratio, experiments were undertaken at the 1:1, 2:1 and 4:1 levels and on the basis of both effective sample delivered and minimal distance measurement achieved the 2:1 ratio

was chosen. Essentially this means that the latest completed six-months of TGI fieldwork offers itself up for fusion to the current continuous reporting adult BARB sample; i.e. 12,000 : 6,000 adults respectively.

6.   The usual problem with fusion, i.e. that of regression to the mean, was examined during validation work using a split TGI sample. The results on both a product field and viewing segment basis were most encouraging. Table 3 shows the broad results of this work. On the consumer goods side (asked only of Housewives within the TGI) there was, on average, virtually no regression to the mean and BARBs own independent evaluation, carried out by Ken Baker Associates, concluded that the fused results were as almost as accurate as they would have been if they had been collected on a true single source basis.

Data for women and adults showed some greater level of regression but at worst it was no higher than 25% and usually a lot lower. Generally speaking it would appear that lifestyle or attitude related purchase decisions are more difficult to predict from a purely demographic based fusion exercise.

Overall however the average of only 14% regression to the mean is, to say the least, encouraging and is, in fact, in the field of T.V. planning a useful buffer against the over-exaggeration of the discriminatory powers of the TGI/BARB fusion exercise.

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The Findings

The volume of findings based on T.V. targeting decisions potentially affected by the use of fused data is vast and getting larger. In summary they seem to point towards some major potential increased efficiencies in the area of T.V. planning, buying and also (if it does not seem to be a contradiction) selling.

Such efficiencies if converted to cash at least pay for the cost of the fusion and more often could release advertising monies which would be used to extend the T.V. advertising into additional areas of the country or into other media - perhaps the press!

Should the latter happen it is likely to lead to a demand for the fused database to offer itself as a tool for aiding intermedia decisions and therefore a basic check should be carried out as to the basic readership information attributed to the BARB panel by way of the fusion with the TGI.

Two things should be remembered at this point: Firstly, that the TGI average issue readership figure is re-weighted at the gross level (i.e. all adults, all men or all women whichever is applicable) to that of the U.K.'s National Readership Survey.

Secondly, as we have mentioned above, readership was not part of the analysis of variance carried out in the calculation of importance weights and can therefore be regarded as comparatively 'free-floating' in this respect.

We would expect however, given the quality of the two samples and the number of common variables, that readership should be reproduced at top-line penetration levels with a high degree of accuracy.

This proved to be correct as is revealed in Tables (4 and 5) which show a selection of comparisons between the two surveys. The donor survey (TGI) is, in its finally published form, weighted to match the UK's National Readership Survey however these comparisons are done using TGI prior to this stage of weighting as it is lost in the fusion exercise.

A selection of titles are examined ranging from popular daily newspapers, mid and up-market titles and a variety of magazine titles chosen here for their probable familiarity to such an audience as this.

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As expected the top-line adult penetration levels are extremely close not only to each other but also to average issue readership found by applying a postal questionnaire to the BARB panel itself. Considering the different nature of this research technique, the questioning used and a slightly varying time period the closeness off it is indeed encouraging.

One title from each section was then taken (based on high precision of match) for further investigation at a demographic profile level.

These figures (see Tables 6-19) - show that whilst sex comparisons are, for the most part, close - as are those based on age, - the social class profile figures do not line up with the sort of closeness that one would ideally like to see.

Obviously, in the fusion process itself, sex, was a critical variable and age was given the highest importance weight amongst both men and women.

Within social class however the weighting was somewhat lower although interestingly in the cases of up-market newspapers with a younger age profile than that of the Telegraph and where Terminal Education Age may come into play as a relatively more powerful influence, the AB social grade comparisons were a great deal closer.

CONCLUSIONS

Obviously this fusion was carried out mainly for the purpose of ascribing product purchasing data to the otherwise TV measurement only of the BARB panel.

Newspaper readership was not included in the analysis of variance used to validate the work and therefore we should not expect anything better than we have actually got.

However the results are extremely encouraging and, when the BARB panel increases its overall size by 50% this summer, a new fusion will take place which will both enhance the reliability of the overall product and create the basis of what could become a highly usable multi-media database for both planning and buying purposes.

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'READERSHIP COMPARISONS'

1.   TGI (pre-NRS weighting) v BARB Fused.

TABLE 1

Sex	(2 Groups)
Age	(Actual)
Class	(5 Groups)
Household Status	(5 Groups)
Terminal Education Age	(4 Groups)
Household Size	(5 Groups)
Children 0-4	(Yes/No)
Children 5-15	(Yes/No)
Number of TV sets	(3 Groups)
VCR Ownership	(Yes/No)
Working Status	(3 Groups)
Total TV weight of viewing	(5 Groups)
Commercial TV weight of viewing	(5 Groups)

TABLE 2

	Men	Women
Social Class	1.00	0.87
Household Status	1.20	1.43
Work Status	1.31	0.77
Terminal Ed. age	1.17	1.29
Household size	0.94	0.93
Children 0-4	0.55	0.73
5-15	0.96	1.05
TV set ownership	0.44	0.40
VCR ownership	1.14	1.11
Actual age	1.51	1.36
Total TV weight of viewing	1.00	1.22
Commercial TV weight of viewing	0.79	0.84

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TABLE 3

	Difference real v. fused outside 1.96 standard error %	Retained efficiency %	Regression to the mean %
Housewife products	10	100	0
Women products	16	88	12
Household products	12	95	5
Adult products	16	77	23
Average	**14**	**86**	**14**

TABLE 4

	TGI % 16+	BARB % 16+	BARB 'ACTUAL' %
Daily Star	6.2	6.5	5
Daily Mirror	19.1	19.2	18
Sun	24.9	23.9	19
Today	4.0	4.3	3
Daily Express	9.7	9.4	10
Daily Mail	11.0	10.8	11
Financial Times	1.4	1.3	1
The Times	2.8	3.0	2
The Independent	2.9	2.9	3
The Guardian	3.5	3.2	2
Daily Telegraph	6.4	6.4	8

TABLE 5

	TGI 16+ %	BARB 16+ %
Golf Monthly	1.8	1.8
Smash Hits	3.5	3.3
Vogue	3.8	3.9
Good Housekeeping	4.2	4.5
Cosmopolitan	5.0	4.8
Readers Digest	10.7	10.7
TV Times	18.0	17.6

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TABLE 6
OVERALL SAMPLES
- SOCIAL GRADE % PROFILE

	AB	C1	C2	D	E
TGI	17.8	23.4	29.3	17.1	14.1
BARB	18.3	24.5	26.6	16.6	12.4

TABLE 7
DAILY MIRROR
- SOCIAL GRADE % PROFILE

	AB	C1	C2	D	E
TGI	6.3	18.6	39.0	23.5	12.6
BARB	9.7	21.1	20.05	23.0	16.7

TABLE 8
DAILY MAIL
- SOCIAL GRADE % PROFILE

	AB	C1	C2	D	E
TGI	20.3	31.1	28.4	12.4	7.8
BARB	20.9	29.0	22.4	16.5	11.2

TABLE 9
DAILY TELEGRAPH
- SOCIAL GRADE % PROFILE

	AB	C1	C2	D	E
TGI	49.3	29.5	13.3	3.5	4.4
BARB	38.4	29.0	15.1	7.9	9.7

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TABLE 10
READERS DIGEST
- SOCIAL GRADE % PROFILE

	AB	C1	C2	D	E
TGI	23.1	27.5	26.6	13.1	9.7
BARB	22.7	28.0	20.4	15.3	13.6

HONG KONG SYMPOSIUM

TABLE 11
DAILY MIRROR
- AGE PROFILE %

	16-24	25-34	35-44	45-54	55+
TGI	17.9	17.9	18.0	15.0	31.3
BARB	18.1	16.2	17.6	15.0	33.3

TABLE 12
OVERALL SAMPLES
AGE PROFILES %

	16-24	25-34	35-44	45-54	55+
TGI	17.6	18.8	17.0	14.3	32.3
BARB	17.0	18.4	18.2	14.3	32.1

TABLE 13
DAILY MAIL
- AGE PROFILE %

	16-24	25-34	35-44	45-54	55+
TGI	15.6	14.4	16.3	16.4	37.2
BARB	16.1	14.7	15.7	15.0	38.5

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TABLE 14
DAILY TELEGRAPH
- AGE PROFILE %

	16-24	25-34	35-44	45-54	55+
TGI	14.2	14.0	12.1	15.4	44.4
BARB	11.0	13.1	17.0	18.5	40.4

TABLE 15
READERS DIGEST
- AGE PROFILE %

	16-24	25-34	35-44	45-54	55+
TGI	9.8	11.8	17.3	18.2	43.1
BARB	9.6	13.8	18.8	18.8	39.0

TABLE 16
DAILY MIRROR
SEX PROFILE %

	Male	Female
TGI	55.0	45.0
BARB	47.9	52.1

TABLE 17
OVERALL SAMPLE
SEX PROFILE %

	Male	Female
TGI	48.4	51.6
BARB	47.5	52.5

TABLE 18
DAILY TELEGRAPH
SEX PROFILE %

	Male	Female
TGI	55.5	44.5
BARB	57.3	42.7

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TABLE 19
DAILY MAIL
SEX PROFILE %

	Male	Female
TGI	48.7	51.3
BARB	47.9	52.1

TABLE 20
READERS DIGEST
SEX PROFILE %

	Male	Female
TGI	52.7	47.3
BARB	50.8	49.2

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