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ARE ALL THOSE CALL-BACKS REALLY NECESSARY?

Because of the concern in sample surveys over the magnitude of the non-response group and its effect upon the reliability and validity of survey conclusions, a number of organisations that utilise survey findings have attempted to establish minimum levels of response rates for surveys that are undertaken under their sponsorship. For example, the United States Office of Management and Budget in 1977 issued a memo which stated, "It is expected that data collections for statistical purposes have a response of at least 75%."

In establishing standards for auditing media audience research, the Advertising Research Foundation is proposing that: "A minimum response rate of 70% should be obtained. To achieve an acceptable level of response, at least five call-backs are recommended if the designated respondent cannot be reached on the first call."

How are these standards set? As far as we know, these are not based upon any empirical data. They appear to be judgemental. For example, a number of years ago both the ARF and the US Office of Management and Budget set 80% as the minimum level. Are these values 70, 75 or 80% magic numbers? What happens when we have lower response rates or make fewer calls? How efficient are statistical adjustment techniques when lower rates of response are obtained?

A great deal of light is shed on the answers to these questions from special tabulations from data obtained from the 1984 PMB Print Media study.

The Print Measurement Bureau conducts Canada's major media survey by means of an in-house personal interview with a selected respondent using the

Through-the-Book technique for measuring readership. In order to achieve an acceptable response rate, the specifications required that seven calls be made at the respondent's home. Refusals were also re-attempted. A total of 13,078 completed interviews was obtained.

RESPONSE RATES

By dividing the total completed interviews by the total number of dwelling units selected in the sample a response rate of 68.7% is obtained. However, when the sample was selected disproportional allocation was used and oversampling was done in those places where response rates tend to be lower than the average. If a proportionate sample had been used then an overall response rate of more than 70% would have been obtained. In this analysis we shall be using the actual response rate.

Table 1 shows the cumulated response rate by call for total Canada; for the three cities of more than 1,000,000 population (Toronto, Montreal and Vancouver); for cities of 100,000 to 1,000,000 population and for places of less than 100,000 persons.

It can be seen that response rates tend to increase as the size of place decreases. In rural places a higher response rate was achieved after three calls that in other areas after seven attempts.

SAMPLE WEIGHTING

Before tabulations of the interviews were made the individual data were weighted. This was done for two reasons:

(1) To take into account different probabilities of selection of households and individuals.

(2) To take into account different response rates among the different groups. This process known as sample balancing was done on the basis of city size and geography, size of household and age by sex.

METHOD OF ANALYSIS

For the analysis of the effect of repeated calls, the total number of completed interviews that had already been weighted and sample balanced was taken as the universe. As the call number varies the sample composition and characteristics vary. In the following analysis the cumulated sample could be rebalanced with respect to size of place. Thus, after each cumulation the sample distribution with respect to large cities, medium size cities and rural places was set to be the same as total Canada.

So as not to be surprised at the relative stability of the survey findings by cumulated call number we should like to take an example, which many articles and books on survey sampling leave unfinished. To illustrate the necessity of making call-backs reference is made to the percentage of respondents living in rental dwelling units. On the first

call one expects to miss most of them and on succeeding calls more and more will be picked up. Indeed, this is the case as shown in Column (1) in Table 2. There is an upward trend from 24.5% for the first call to 41.7% on the seventh call.

What is left unsaid is the percentage of the sample obtained at the various calls. This is shown in Column (2). Most of the interviews are obtained in the first three calls and the effect of additional calls tends to be minimised. When the data are cumulated according to call number the impact of these later calls is shown in Column (3). All of this has been accomplished without reweighting. According to the response rate patterns large cities, where the incidence of renting is high, are underrepresented at the first few calls. This means that it would be desirable to weight the sample after each cumulation to bring it into line with the urban-rural distribution. The effect of this is shown in the last column of the table.

FINDINGS - MAGAZINE AUDIENCES

So as to lean over backwards in our analysis none of the following data have been weighted. Table 3 shows the level of audience penetration for a number of magazines after one-to-seven calls have been made.

TABLE 1
Cumulated response rates by size of place - %

<i>Call number</i>	<i>Total</i>	<i>Large cities >1,000,000</i>	<i>Middle size place 100,000-1,000,000</i>	<i>Rural places <100,000</i>
1	24.2	16.2	23.4	42.2
2	42.9	32.3	44.5	64.1
3	53.2	41.9	56.7	73.9
4	58.6	48.0	63.7	75.9
5	61.9	53.0	65.8	76.9
6	65.8	58.7	68.8	77.8
7	68.7	63.4	70.6	78.1

TABLE 2
Percent of persons living in rental units
(Final estimate = 28.2%)

Call number	Percent incidence at call	Percent of sample	Cumulated percent (unweighted)	Cumulated percent (weighted)
1	24.5	39.4	24.5	26.9
2	26.7	28.1	25.4	26.9
3	28.9	14.4	26.0	27.1
4	35.4	6.3	26.7	27.5
5	36.8	3.5	27.1	27.7
6	43.3	4.2	27.8	28.0
7	41.7	4.4	28.2	28.2

TABLE 3
Magazine audience penetration by cumulated call

Call number	Reader's Digest	Chatelaine	TV Guide	Macleans	Homemaker
1	22.1	14.9	11.4	11.5	7.2
2	22.0	15.3	12.1	12.0	8.4
3	21.5	15.4	12.5	11.9	9.0
4	21.3	15.5	12.6	11.9	9.3
5	21.1	15.4	12.6	11.9	9.5
6	20.7	15.4	12.6	11.9	9.6
7	20.4	15.3	12.6	11.9	9.7

TABLE 4
Penetration to other media
by cumulated call

Call number	Watched TV	Listened to radio	Read newspaper
1	75.9	71.0	54.8
2	75.5	71.9	56.7
3	74.5	72.2	57.3
4	74.0	72.5	58.0
5	73.6	72.8	57.8
6	73.6	72.7	57.8
7	73.6	72.8	58.0

FINDINGS - OTHER MEDIA PARTICIPATION

With respect to other media we find a similar situation. (Table 4)

FINDINGS - INVENTORY OF READING

While the percent of readers remain invariant by call number, does this hold for the intensity of reading? Three measures were obtained in the PMB Study. They were: (1) Degree of interest as measured on a 10-point scale, (2) Time spent for each magazine read, and (3) Number of reading occasions. These measures were

with respect to call number. The only exception was in the case of time spent. In the case of *TV Guide* the average time spent at the first call was 75.7 minutes. This average declined to 61.7 minutes for the final estimate.

Time appears to be the only variable that is somewhat affected by call number. (Table 5)

FINDINGS - PSYCHOGRAPHICS

The effects of repeated call backs upon measures of psychographic attributes were determined. A series of statements was read to each respondent

and he or she was asked to express agreement or disagreement by indicating a number on a 10-point scale. When the percentage of respondents expressing a 'strongly agree' (8, 9 or 10) for six test items is evaluated there is a slight effect by call-back. This is shown in Table 6.

COSTS

An analyses of field costs indicated as to be expected, a diminishing rate of return of completed interviews. When these expenditures are compared with yields the following results were obtained. (Table 7)

TABLE 5
Time spent with various magazines (in minutes)

Call number	Reader's Digest	Chatelaine	TV Guide	Maclean	Homemaker
1	144.2	89.6	75.7	71.7	54.2
2	140.8	84.5	67.7	65.9	53.5
3	138.2	83.1	63.5	65.4	54.3
4	138.4	83.6	63.2	64.9	55.0
5	137.0	83.0	62.9	65.3	55.5
6	137.0	83.3	62.0	65.3	55.4
7	136.1	83.0	61.7	65.5	55.8

TABLE 6
Psychographic indicators by cumulated call

Call number	Home orientation	Financial optimism	Importance family life	Try new things	Tradition oriented	Ahead of friends for new products
1	25.4	15.3	32.5	26.6	23.1	8.9
2	25.1	16.9	33.1	29.4	23.8	9.4
3	25.4	17.7	33.9	30.3	24.3	9.6
4	25.8	18.4	34.5	31.1	24.8	9.9
5	26.0	18.9	34.9	31.7	25.3	10.1
6	26.3	19.3	35.3	32.2	25.8	10.4
7	26.5	19.7	36.5	32.6	26.2	10.5

TABLE 7
Field cost analysis

<i>Call number</i> %	<i>Cumulated field costs</i> %	<i>Cumulated interviews</i> %
1	25.3	34.5
2	48.0	63.1
3	63.0	76.0
4	72.9	83.7
5	80.2	88.4
6	88.3	93.8
7	100.0	100.0

Thus, after four calls 72.9% of the expenditures was made, yielding 83.7% of the interviews. Looking at it another way, about 16% of the interviews required 27% of the costs.

SUMMARY AND CONCLUSIONS

(A) The results of this investigation indicate that the effect of more than three call-backs on estimates of survey variables is only slight. This is due to the confluence of three factors.

(1) After the fourth call five-sixths of the potential interviews have been obtained. The impact of the one-sixth remaining cases upon the total cannot be large.

(2) The use of ratio estimating procedures provides a degree of stability to the findings obtained after successive calls.

(3) Many variables appear not be affected by the availability of respondents within defined demographic segments of the population.

(B) In order to obtain the one-sixth of the interviews on the fifth and subsequent calls over one-fourth of the field costs were required.

(C) It makes no sense to specify a uniform fixed number of call-backs. For example, the completion rate after three calls in places of less than 100,000 population was greater than rates obtained after seven calls for the remainder of Canada.

(D) For this particular 1984 PMB Study essentially the same results would have been obtained on the fourth call as after all calls.

(E) Even though slight changes were obtained after four calls different publications were affected differently. For some magazines there were slight increases in readership and for others there were decreases. This may pose a problem when the competitive environment of the selling of magazine space is considered.

(F) We are not making an unequivocal recommendation applicable to all surveys. This would require a review of other studies dealing with other subject matters conducted in different environments. Additional replications would be required.