FROM QUOTA TO RANDOM SAMPLING: INCREASING THE CREDIBILTY OF MARKETING RESEARCH DATA

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1 INTRODUCTION

What is Marketing Research

- Marketing Research is "the systematic planning, gathering, recording, analyzing and interpreting of data for application to specific marketing decisions" (Luck et al, 1982, p. 6).

- Some marketing researchers, like Figura (4, p. 5), go further: Marketing "Research must contribute to improved performance, not through risk reduction, but through the discovery and enhancement of opportunities."

- "Marketing Research is characterized by its use of orderly scientific procedure" (13, p. 3).

Having given some indication of what Marketing Research is or what it should be, the next question I would like to put to you is:

In what research activities are we as marketing researchers involved?

There are many activities. **Diagram 1** shows some of the major activities of Marketing Research.

Diagram 1

Research activities and the Sampling Method generally used

Research activity	Sampling method	Used for
DESK RESEARCH **MOTIVATION AND QUALITATIVE RESEARCH**	(Non-probability sampling)	• Define Research Problem
EXPERIMENTAL DESIGN AND MODELS	(Quota sampling)	• Research the effect of different stimuli (making comparisons) • Difference distributions (Residuals)
TRADE RESEARCH	(Auditing)	• Basic Market movements on new materials, machinery and labour requirements. • Competitor strength and weaknesses.
PANEL RESEARCH	(Initial random sampling)	• Trend analysis. • Purchasing or viewing behaviour.
OMNIBUS SURVEYS	(Variations on quota & random sampling)	• Cost and Time savings. • Regular Surveys.

The sampling method(s) generally used by Marketing Research companies are shown in brackets. This brings me to the problem I would like to focus on:

How can we as marketing researchers make more use of random sampling in order to increase the credibility of marketing research data?

Worcester (13, p. 4) suggests the following:

"If a client does not know much about his market or indeed much about a particular problem, he is best advised to use desk research and qualitative research and to proceed from that stage learning more and more about his market as he proceeds."

Tukey (1977, 11) developed innovative ideas in his book "Exploratory Data Analysis" to direct us in learning more about the data.

This paper will suggest a solution by using exploratory techniques to bridge the gap between quota (non-random) sampling and random sampling.

2 BACKGROUND ON SAMPLING METHODS

2.1 Basic concepts

- According to Warwick et al, sampling (is) the process of selecting a part from the whole;
- A population is any complete group, whether of people, houses, farms or pigs;
- Elements are the individual units making up the population;
- Universe covers events or things that are without numerical limit (12, p. 71).

An important point to note is that a sample is never adequate or inadequate in itself. Under conditions of high homogeneity, almost any sample is as good as any other. For example, the host at a dinner tastes the glass of wine to determine if the entire bottle is suitable for his guests. He assumes that there is no variability in taste throughout the bottle.

Unfortunately in samples involving people such homogeneity can never be taken for granted.

Therefore, variability in our response data is one of the most important factors to take into account when deciding on the size of the sample as well as the question of whether one can use quota sampling or random sampling.

- Random (probability) sampling consists of selecting elements from some universe (or population) with the intention of making inferences about that universe (or population)" (3, p. 126);
- By a probability sample from a population we mean a sample chosen in such a way that each element of the population is being included in the sample."

A random sample can be subdivided into smaller random samples by breaking it up randomly. This sample property will form part of the methodology of the suggested solution to our problem.

Bailey states that:

- Quota sampling is the non-probability sampling equivalent of stratified sampling with the added requirement that each stratum is generally represented in the sample in the same proportion as in the entire population. (1, p. 81).

2.2 Conclusion

Quota samples are essentially judgment samples and are not probability samples.

However, in trying to find a solution to our problem, we will of course, opt for probability sampling, but it does not imply that quota sampling cannot be used, for example, in the exploratory phase of our research.

3 DESIGNING YOUR SAMPLE

At this stage, I shall concentrate on other random sampling techniques.

3.1 Stratified sampling

Stratified sampling is a selection method for achieving a greater degree of representativeness. Stratified random sampling is based on the concept that a homogeneous population produces samples with smaller sampling errors than does a heterogeneous population.

3.2 Proportional stratified random sampling

A proportional stratified sample is one where the number chosen in each stratum is proportional to its share of the total population. This method absolves its user from the need of weighting considerations and considerably simplifies the calculation of certain statistics such as the mean and standard error (10, p. 31).

3.3 Cluster sampling/Area sampling

In many instances in Marketing Research, lists of elements may not be available. Under such circumstances, it is necessary to develop a sample selection procedure based on clusters of elements

The procedure involves the initial probability sampling of a number of groups of elements (clusters) followed by the selection of all elements within each selected cluster.

3.4 Multistage cluster sampling

If the subsets as mentioned above consist of groups of population members, then we can proceed to further stages of sub-sampling. In this latter case, we encounter multistage cluster sampling. The probability sampling mechanism at each stage is simple random sampling.

3.5 Conclusion

In practice, I am glad to state that most South African marketing research companies use a combination of the above mentioned random sampling methods, for example, a preliminary stratification and then a multistage cluster sampling, called Complex Random Sampling – (Stoker, 1988, p. 8) in Panel Research and Omnibus surveys.

4 SEQUENTIAL SAMPLING

Sequential methods were first developed during the Second World War, principally by Wald in the USA and simultaneously in England by GA Barnard (7, 592p).

In the operations (manufacturing) environment, sequential sampling plans are based on selecting a sequence of smaller samples from a lot (or original sample).

The results of the smaller samples are accumulated and a decision is made to

(i) reject the lot

(ii) accept the lot, or

(iii) inspect another item (2, p. 201).

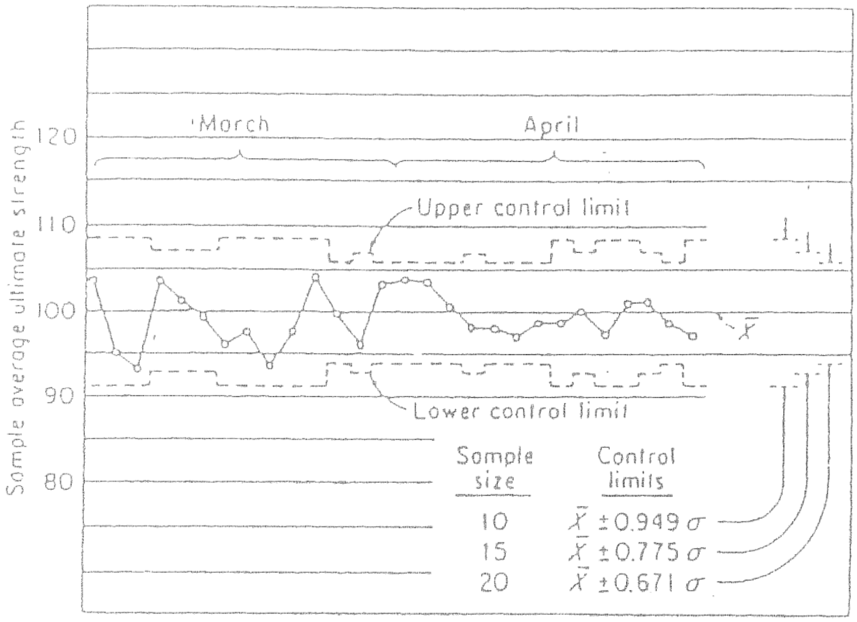
Wald estimated that the sequential plan could reduce the average sample size by about one-half, as compared to a single sampling plan.

Although our problem is not related to “rejecting” and “accepting” a lot (small sample), the underlying principle is that one can accumulate the random sub-samples.

The use of control charts in statistical quality control developed by Shewhart in 1924 (6, p. 12) is well known, for example, the X-Charts (Mean Charts) end the R-Charts (Range Charts). The issue of stability of the variable in question is of course at the heart of the use of most control charts.

Diagram 2

X-Chart illustrating variation of control limits with sample size (6, p. 174)



By combining complex sampling and sequential sampling, we come to the proposed solution to our problem.

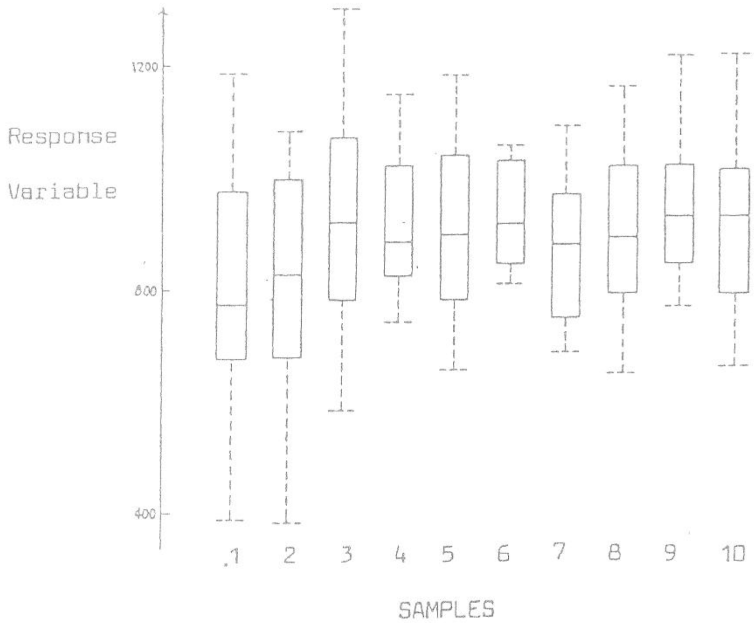
5 COMBINING COMPLEX RANDOM SAMPLING AND SEQUENTIAL SAMPLING

Once we have identified our elements in the sample clusters, by using a proportional stratified clustering scheme, we may, for example, have drawn ten clusters with different numbers of elements in each cluster.

By randomly selecting a cluster (sample 1) we can use a parallel schematic plot (11, p. 265) to show the midpoint of the data, the lower quartile, the upper quartile and the range of the data. Other clusters (sample 2, etc), can also be graphed as shown in Diagram 3. Note the variability of the different samples.

Diagram 3

Parallel schematic plots of the random samples



We are actually exploring our sample according to the different clusters we have drawn from the random sample. We can compare it with the control charts discussed earlier.

The power of the proposed technique actually lies in merging the samples, using the sequential methodology. If the response variable statistics, for example, the mean, converges after the merging of a number of samples, we may stop and do our final calculations on the merged samples.

What is the implication of the proposed method?

(i) Although a lot of energy will go into developing the sample plan, the sampling size can in certain cases be dramatically reduced (especially when the variability is small).

(ii) If the response variables are not affected by sampling at different times, cost reduction is evident.

(iii) We still have a random sample which will enable us to make inferences about the population.

(iv) We have the advantage of exploring our data as we do the sampling and will be in a much better position to propose solutions to the research problem.

6 CONCLUSION

In this paper, I briefly discussed some marketing research activities relating to quota and random sampling and identified a problem area in terms of the credibility of marketing research data.

By using a complex random sampling method and combining sequential sampling with it, I proposed a solution for moving away from quota sampling to random sampling, in order to increase the credibility of the marketing research data.

The proposed method can be used in the townships or suburbs using proportional stratified (towns) and multistage cluster (area) sampling (9, p 18). The samples can be explored by using parallel schematic plots and merging the samples sequentially up to a final data set (not necessarily the whole sample) for a final data set to be analyzed.

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