

The availability of consumer purchasing data has increased considerably in the United States in the last few years on account of the introduction of the Universal Product Code on grocery packages. This paper compares existing data collection methods for Consumer Panels with those based on electronic scanning and discusses the advantages and disadvantages of scanner panels and their likely effect on existing consumer panel operations. At this stage, Consumer Diary Panels are likely to be operating in their current form for some time to come.

#### INTRODUCTION

Consumer Diary Panels first appeared about forty years ago - the Industrial Surveys Company (now the Market Research Corporation of America) established a national consumer panel in the United States of 2,000 families in October 1941.

The Consumer Panel of Canada was founded in 1946, while the Attwood Consumer Panel was established in Great Britain in 1948.

Since the introduction of consumer panels, their use by marketing companies has increased rapidly. Panels have been established in over twenty countries providing, in addition to standard brand share data, a wide array of special analyses such as; brand loyalty and switching, extent of heavy buying and the measurement of the success of the launch of new brands.

#### COLLECTION OF PURCHASING INFORMATION BY DIARY

Panel members in Europe and North America record details of their purchases in a diary which has a separate section for each product field in order to allow for specific requirements in individual product fields.

An index is included in the front of the diary so as to assist the person filling in the diary in locating the page on which the required entry is positioned. The person filling in the diary is asked to look through the diary at the end of the reporting period and to tick where appropriate a none-bought square.

Some diary panels have been established for which the diary is delivered to and collected from the household, rather than using the mail. This provides an opportunity for the panel operator to check whether the diary has been completed correctly.

Direct validation of diary completion is very difficult. Random calls can be carried out during the week of completion to determine whether the diary has been completed up to the time of call. However, these calls will generally miss the peak shopping expeditions which take place on Friday and Saturday. Monthly calls were used for a while on the Attwood Consumer Panel homes in Great Britain so as to check the purchasing in a limited number of fields. The amount of purchasing missed was found to be fairly small, mainly in quickly consumed categories. 'Pantry Checks' where items in stock (in a number of fields) are verified go some way to establishing the validity of diary reporting.

The reporting level for product fields included in a diary has been discussed (Ehrenberg (1)) in terms of the number of product categories included in the diary. The study carried out in Holland showed that a 50% increase in the number of product fields on the diary did not alter the reporting levels of the existing fields. The effect of diary entry position was discussed by Sudman (2). He showed that reporting level was lower in the middle pages of the diary. Also, reporting level was lower for product categories with more complex entries, that is with more check-boxes.

#### NON-DIARY DATA COLLECTION

A rather different method of collecting purchasing information was developed in Great Britain during the mid-sixties by Audits of Great Britain. Households were asked to retain all empty packages in a container (commonly called a 'dustbin') supplied for the purpose. After recruitment to the panel an interviewer placed a special label on each opened and unopened package. On subsequent visits, unlabeled packages were labeled and the container was checked for unmarked packages so that the items actually purchased in the previous week could be identified. Advantages were claimed for this system including better reporting of special offers. However, there was the possibility of unpleasant wrappers and containers (e.g. cat food) not being retained in the summer and the possibility of personal items (such as analgesics) being carried around by the user.

Although diary completion was eliminated, the interviewer was required to proceed through a list of product categories in a systematic fashion. The interviewer was required to search the house for unopened or partly used packages, however this search could become less diligent towards the end of the list or in a disorganized household.

The AGB system is not immune from the problem of sales estimates for products differing from client shipments. In a paper given at the ESOMAR Seminar on panels in Lucerne, Loughrey (3) showed data on how reporting of a brand of biscuits fell away when the type of wrapper was altered from cardboard to coloured cellophane.

#### ADVENT OF UNIVERSAL CODING

The introduction of Universal Product Codes (U.P.C.'s) or Article Numbering has created a completely new set of possibilities as far as data collection is concerned. A comprehensive survey of the data available was included in a special report on Test Marketing included in Advertising Age (4).

The Universal Product Code consists of a series of bars on a package which identifies to an electronic reader the product, size and manufacturer of the article in question. The combinations of bars and spaces signify different numbers which are printed under the code. At the check-out, the package is pulled across the scanner window to feed the information into a mini-computer. This then looks up the price of the item on disk and prints on the check-out register, the item, name, and price.

A number of panels are available in the United States which make use of this scanning technology. A sample of households who use scanner stores are selected and provided with cards (one for each household member) which are readable by the scanning equipment. At each shopping visit to the store the panel member presents the special Panel Identification Card. This alerts the cashier to activate the Scanner System so that all of the panel member's purchases are instantaneously recorded on a Computer File.

While this general methodology is consistent across the various scanner panels, there are major differences in the way the panels are structured. No company so far has developed a sample of shoppers that is representative of shoppers on a total U.S. basis or even a regional basis. The use of scanner panels has, therefore, been confined to test markets and specific chains within cities.

BehaviorScan is operated by Information Resources Inc. (IRI) in six small cities: Pittsfield, Mass., Marion, Indiana, Midland, Texas, Visalia, California, Rome, Georgia, and Eau Claire, Wisconsin. Two new cities are due to be added. In each of these cities all of the supermarkets have been provided with Scanners at no cost to the store.

IRI maintains direct access to store data files on a daily basis. In each market 2,500 households have been recruited, who can shop at any supermarket (representing 95% of more of ACV in each market). Each store is visited by IRI personnel on a regular basis who record details of brand promotion activity.

In contrast to the BehaviorScan approach, there are two other Scanner Panel services available in the United States which rely on a limited number of stores. The Test Marketing Group's, Samscan operates in 3 cities, Portland, Maine, Evansville, Indiana, and Orlando, Florida. Tele-Research Item Movement Inc. (TRIM) operates in St. Louis and Los Angeles. The Samscan panel uses in total 75 stores while TRIM uses 9 supermarkets in both St. Louis and Los Angeles.

In Canada the only scanning service currently operating is the Nielsen Electronic Diary Service which is based upon a panel of 2,000 households shopping at 9 stores with Scanners in Metro Toronto.

#### USE OF SCANNER PANELS

The possibility exists for obtaining a wider range of data concerning the purchases made by the household at the outlets at which purchases are made compared with conventional Consumer Panels. In fact the vast quantity of rich data available can well lead to analytical indigestion and, misinterpretation if the nature of the universe from which the sample shoppers is drawn is not taken into account.

Unique data are available in that for each purchase made, it is possible to identify the price and availability of other brands in the field. This means that for each purchase made, the price relative to other brands available is obtainable. With the possibility of varying the price of the test brand as required, purchasing levels of a new brand can be related to a controlled range of relative prices.

Scanner data are capable of revealing the effect of variation of marketing variables over short time periods on the market share of a new brand. For example, Brand Shares can be tracked weekly to show the effect of coupons, in-store features and advertising together with the effect of competitive activity.

#### ADVANTAGES AND DISADVANTAGES OF SCANNER PANELS

Advantages claimed for Scanner Panels include:

##### Reduced Panel Member Household

The only activity required of a panel member is the showing of an I.D. card to the cashier. This is claimed to lead to more efficient recruitment, better representation of certain demographic segments and a dramatic reduction of Panel drop-out rates.

### Instantaneous Computerised Data Generation

Data relating to products purchased by the panel member are instantaneously recorded on computer files by the Scanner system at the time of purchase. This is claimed to lead to:

- (i) Complete Product Category Coverage - All product categories which contain U.P.C. coding will be tracked - not just product fields which are specified in a diary at a particular point in time.
- (ii) Exact Brand-Item Product Detail.
- (iii) Elimination of memory bias which might result when diaries are completed.
- (iv) Availability of data shortly after purchase transactions.
- (v) Increased ability to conduct tests of promotions, coupons, etc.

On the other side of the coin, Scanner data will have disadvantages as follows:

#### Breakdowns of Scanner Equipment

In small stores a breakdown of Scanner equipment can seriously compromise sample designs involving price changes, promotions etc.

#### Store Irregularities

Problems can arise when the check-out operator does not act in accordance with management requirements, for example:

- Failure to pass each package over scanner - when for example six packages of various flavours are purchased each at the same price, one of the packages may be passed over scanner as representative of the six packages of different flavours.
- Packages of unwieldy sizes may not be passed through equipment.

#### Incomplete Data

- The U.P.C. codes may not in all cases be detailed enough to enable sufficient discrimination within product fields.
- The same U.P.C. code may be used for more than one sub-category.
- No U.P.C. code on the package.

### Are Scanning Panels Representative?

By the end of 1982, over 6,000 (accounting for 29% of All Commodity Volume) stores in the United States were using Scanner equipment. By 1985 it is expected that more than half of the United States food sales will be recorded on Scanners. In Canada at the end of 1982 there were under 300 stores with scanner equipment accounting for less than 10% of All Commodity Volume.

It will therefore be some time before panels representative of all purchases made by households will be feasible in the United States and even longer in Canada.

The BehaviorScan panels would appear to represent almost all purchases made in the town in which the panels are established although purchases made outside the area covered by the stores will not be collected. The other Scanner panels are recruited from shoppers who made a high proportion of their purchases at the Scanner Stores from whose shoppers the panel is recruited.

The requirement of high loyalty to individual outlets has been investigated both to determine the percentage of households that would be eligible and also whether the eligible households are likely to be representative of the shopping universe.

The first investigation, carried out by N.P.D. Research, Inc., New York, consists of a comparison of the purchasing behavior of, families, who are single-store shoppers with shoppers at more than one store was reported by Andrew Tarshis in Marketing News (5).

An analysis was made of six month's data provided by 1,000 households in 20 product categories. Division of households and volume by stores used was as follows:

Stores	Households	Volume
1	10%	8%
2-3	50%	47%
4 and over	40%	45%

In terms of demographic characteristics, single-store buyers were less educated and had a lower income than multiple-store shoppers. Single-store shoppers were less "deal" prone than multiple-store shoppers. While single store shoppers make 24% of their purchases on deal multiple-store shoppers made 32% of their purchases on deal. Also, single-store shoppers bought relatively less private-label brands and made more purchases of the five top brands than multiple-store shoppers.

In the second investigation an analysis was made of the distribution of purchases (for Ontario) in the 70 product categories contained in the ISI International Surveys Ltd., Canada Grocery Shopping Basket. The 70 categories include all the major packaged products available in grocery outlets. Purchases in January 1983 were analyzed by expenditure among named outlets. The following table shows the breakdown of households and expenditure by the highest percentage spent at any named outlet.

Highest Percentage of Expenditure	Expenditure (%)	HH's	Average Dollars Per Month
100%	8.9%	13.3	51.9
91-99	10.9	9.6	87.5
81-90	11.5	12.1	73.6
71-80	11.6	11.0	82.2
61-70	15.2	14.5	81.6
51-60	16.9	16.5	79.7
Under 50	25.0	23.0	85.0
	100.0	100%	80.0

These data show that for households in Ontario, only 13.3% were 100% loyal to any one named outlet. Also these 100% loyal shoppers spent on average \$52 compared with the average expenditure of \$80 and are as such unrepresentative of all households in terms of grocery expenditure.

The table also shows that a substantial proportion of expenditure was accounted for by households who did not display a high loyalty to any one named outlet. Thus 25% of expenditure was accounted for by households who make less than half of their purchases at any one named outlet, while 57% of expenditure was accounted for by households who spent 70% or less of their expenditure on shopping basket categories at any one named outlet.

This analysis confirms the N.P.D. Research, Inc. finding that a panel restricted to households who are highly loyal to a single outlet is unlikely to be representative of the household universe.

### THE FUTURE

Collection of scanner data from individual stores will provide untold masses of purchasing data which will need to be digested. Data that will be available in quantity for the first time include:

- (a) Time of day at which purchases made. This will influence the extent to which television time in the breakfast and lunch spots will be cost-effective.
- (b) Availability and prices of other brands.

Analyses could be carried out showing the differential between the price of a purchase and other brands in the product category on sale.

Measures of price elasticity will be available based on unaggregated data. The use of Scanner data will enable the change in own-brand elasticity to be tracked over time and should enable more sensitive measures of cross-price elasticity to be produced compared with the methods currently used which involve the analysis of monthly brand shares and monthly average prices.

The next stage in the use of U.P.C. data will result when the household can transmit details of purchase electronically. The U.P.C. code would be scanned in home by an "electronic pencil". A system has been already developed and patented by N.P.C. Research Inc., Port Washington, New York.

Each panel member would be provided with an electronic storage device with a keyboard and to which is attached an electronic wand. For each purchase details of the price paid, special offers, and outlet are keyed in following an interactive changeable prompt message display. The U.P.C. on the package is then scanned with the electronic wand. The prompting sequence guarantees the completeness of the data since the sequence will not be advanced without a data entry. The stored data are then transmitted via a telephone handset to the central computer.

Thus, the progress of new brands will be monitored quickly on a representative sample of households based on purchases made at all outlets, not only those with scanning equipment.

### CONCLUSIONS:

Scanner panels will serve different purposes from diary panels. Concentration on small numbers of stores provides ability to understand environment, but at risk of representativeness.

They may be good for test markets but will not be projectable nationally.

Therefore, although many of the analyses they provide are similar, they are not as yet likely to supercede national diary panels, such as the MRCA and N.P.D. Research panels in the United States and the Consumer Panel of Canada.

Scanning technology through portable in-home sensors may provide the next generation of diary panels.

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