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The Origin and Nature of Statistics on Household ICTs

Leslie Haddon

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TABLE OF CONTENTS

SUMMARY

This paper initially outlines the main sources of publicly available consumption data concerning household information and communications technologies. These sources include official statistics, the research of broadcasting agencies, academic projects and market research.

Sales figures are the only data available for certain product areas. An outline of the origin and nature of these market research statistics provides a basis for understanding both the variation and the consensus between different trade estimates. This is the first occasion where the social factors shaping these measures have been analysed.

Household penetration is arguably the most cited figure in discussions of innovation. Yet, sales and sample data consistently differ as regards this measure. One key factor accounting for this discrepancy is the period when data are collected.

Sample data ultimately contain the most varied information concerning consumption. After examining the key features of sample data, including the degree of variation between different samples, the paper explores the central problems of interpretation this information.

Lastly, the limitations of existing data are examined by noting the theoretically relevant forms of data which are not currently collected. These, together with questions concerning the use of these consumption data, provide the recommendations for further research.

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I. INTRODUCTION

One early task identified within the PICT programme was to chart the data which was available concerning the spread and use of Information and Communications Technologies (ICTs). Several PICT centres participated in this 'Mapping and Measuring' Project, the SPRU contribution to which appears in Miles (1989).

Household ICTs formed one small part of this larger project. Although the main thrust of 'Mapping and Measuring' in this area was to assess how much and what type of data was accessible for different products, the project also generated an analysis of the formation of these statistics (Haddon (1988a). This PICT working paper outlines the origin and nature of these data.

New domestic ICTs have been a relatively neglected area of academic study, although studies of this field are now starting to emerge. Such analyses inevitably make use of some quantitative data on consumption. Whether discussing patterns of adoption of consumer electronics and services or the social impacts of such innovation, even the more qualitative accounts cite at least some figures to contextualise their object of study. Clearly, other bodies such as Government and broadcasting agencies, market research firms and actual producing companies will also have an interest in evaluating the statistics in this field.

The focus of this report is those 'public' consumption data which are widely accessible - especially through libraries. Among the various sources of statistic, market research firms are discussed in more detail since there has been little previous analysis of these particular data generating agencies. Throughout, the paper addresses the following three questions:

How do these consumption figures originate? This is the most straightforward issue, but one of interest to any novice in the area. What sources of data are available concerning the consumption of ICT, and by what mechanics are these figures compiled?

Why do discrepancies exist between certain consumption figures? The two main types of data are derived (a) from sales and (b) from samples of consumers. In both cases, it is often possible to find a considerable variation between different estimates and studies. While some of the differences may be due to statistical chance, what other factors in the collection of information play a part?

What elements of human judgement and company interest shape the available data? Various phenomenological schools within sociology have developed critiques of 'positivism' which question the degree of confidence which can be placed in what appears to be the 'hard' facts generated by quantitative method. How do these insights apply in this field of ICT consumption statistics?

II. SOURCES OF DATA

A. OFFICIAL STATISTICS

The DTI's 'Business Monitor' produces figures on the production and sale of commodities and services while Customs and Excise charts imports and exports in Britain. Both sources can provide data related to the consumption of domestic ICTs, although the Government Statistics Collective (1979) have pointed to factors leading to the unreliability of some of these figures. 'Social Trends' also has a useful section on leisure activities, which consists of figures re-reported from the other official sources and from bodies such as the TV companies' 'Barb' media monitoring system.

However, the two sources of official statistics which are of direct relevance to consumption are the 'Family Expenditure Survey' (FES) and the 'General Household Survey' (GHS). The advantage of these Government statistics is that they are drawn from samples which are larger then many of those supplied in published market research. Moreover, the official agencies pose a regular set of questions. This facilitates comparison over time.

Family Expenditure Survey

The FES is a survey with a sample size of approximately 11,000 households which is conducted annually by the Office of Population Censuses and Surveys on behalf of the Department of Employment. Collection of data is continuous throughout the year and resulting figures are averaged to give weekly breakdowns (1). All members of sample household who are over 16 have to be interviewed. The aim is to chart the types of expenditure and sources of income of UK households.

The sections of the FES which are of relevance are:

a) the 'durable goods' section, which covers figures for buying and repairing audio-visual products;
b) the 'services' sowing expenditure on the rental of TV and VCRs;
c) two separate sections which show possession of a selection of household durable goods, including televisions and telephones, home computers and VCRs.

General Household Survey

The Social Survey division of the Office of Population Censuses and Surveys is responsible for the annual GHS. With a sample size of approximately 12,500 households

(2), the survey usually covers broad topics such as housing, employment, education, health and social services, transport, population and social security. Although some sections appear in virtually every report, the categories of the GHS are less constant than in the FES, with some areas only appearing every few years. One such example is the section on leisure, which contains information concerning TV watching and listening to radio/records and tapes. As with the FES, the other relevant section which appears regularly in the GHS provides data on a selection of household consumer durables possessed by the sample members.

B. **BROADCAST RESEARCH**

The broadcasting authorities have established a substantial apparatus for collecting information about media usage. 'Barb' - the Broadcasters' Audience Research Board, a limited company jointly owned by the BBC and the Independent Television Companies Association - regularly monitors TV output. In addition to this on-going form of co-operation there are also more occasional joint projects between the BBC and independent broadcasting agencies.

In addition, the BBC has its own in-house research unit which acts as a data supplier to Barb, continuously monitors radio output and produces special reports at the request of other departments within the Corporation. The BBC commissions some outside research where it is important to be seen to be independent, or where the Corporation lacks the internal expertise to conduct particular investigations. The IBA has a smaller research unit and commissions more projects from outside analysts. Independent broadcasting companies, such as Channel 4, also occasionally commission their own special reports (3).

The Barb contract for its Audience Measurement Service is currently awarded to the market research firm AGB (4). The research company has a panel of 3000 homes - 7,500 individuals - whose viewing habits are monitored by a meter in the TV set which records which channel is being watched. The BBC's Broadcasting Research Department supplies data to Barb for the Audience Reaction Service which monitors responses to BBC, ITV, Channel 4 and S4C programmes. This monitoring is achieved via the Television Opinion Panel. Each week, 3000 panel respondents return self completion booklets. The responses form the basis of an Appreciation Index, where programmes are rated according to how interesting or enjoyable they were to panel members.

Each year, Barb also commissions the Establishment Survey, the most commonly reported element of which is the household penetration figures for TV related equipment (5). This is a very large sample of approximately 20,000 households.

Other data sources include the 'Daily Survey', where the 'Continuous Services' section of the BBC Broadcasting Research Department routinely measures the audience for radio. In addition, an unpublished Omnibus survey is conducted several times during the year.

Lastly, there are a whole range of special projects, which to date amount to 300-400 items. While there appears to be less IBA research, its reports cover much the same type of ground as those of the BBC.

The 'Daily Life' Projects

One special report of particular interest is the 'Daily life' projects, which are jointly funded by the BBC and the independent TV companies. These studies were carried out in 1983-4 and 1988-9 to find out about media usage and potential audiences. Questions address such issues as how many days per week respondents listen to radio and how often they watch video recordings. A second type of question concerns media preferences - for example, respondents are asked which TV channel they watch most often. There are also tables showing ownership of consumer durables (e.g. home computer, VCR, video games, record or cassette player), and whether TVs are portable, whether the radio can receive long wave, medium wave etc., and whether respondents have access to media which they can use without asking anyone else. Lastly, respondents complete a time sheet recording their main activities for each half-hourly period throughout the day (quarter-hourly in the morning).

C. ACADEMIC STATISTICAL SOURCES

In general, there appears to be very little relevant quantitative data in this whole field of study. The University of Essex' 'Data Archive' is a databank which includes some academic papers alongside its commercial and Governmental material. Apart from this, the most relevant piece of work is that recently carried out by the Centre for Mass Communications Research at Leicester University. Staff there conducted a longitudinal study of the consumption of TV-related products (mainly VCRs, home computers and Teletext) among a local population drawn from different locations in the East Midlands.

In addition to qualitative information, the project generated quantitative data from the full sample of 1064 households, asking questions which are not usually dealt with by market research. The project monitored changes over time within its panel of respondents, showing when different sections of its sample first purchased equipment or replaced it, or even ceased to use certain products and services. Interviews were conducted in 1983, 1985 and 1987. Details of the first 2 phases can be found in Murdock et al.(1985 and 1987).

Time Budget Analysis

Gershuny and Jones (1987), describe how time budget, as distinct from time use studies, analyses focus on the overall amount of time people spend on different types of activity.

Gershuny, Miles et al. (1986) at Bath and SPRU conducted one such study in 1983-4. To achieve comparisons with past time budgets studies, a range of earlier budget data has also been re-analysed, although this process has inevitably entailed a degree of standardisation of categories. The researchers translated both the initial SPRU categories and those of previous studies into the internationally known Szalai codification which divided time use into 40 broad categories of activity, such as 'watching television', listening to radio' and 'listening to music'.

D. **MARKET RESEARCH**

Market research provides information concerning a greater number of product areas, often with more detailed coverage, than alternatives such as Government statistics. Kleinman (1985) has noted that the market research industry has been expanding in recent years and so we can expect further product areas to be covered together with enhanced data becoming available for the commodities which are already reported. in more detail. Because of the significance of this data source and the fact that it has been a relatively neglected area as an object of analysis, market research firms and other related agencies were interviewed for this report.

Private versus Published Research

Only a minority of market research reports are published. A majority of the industry's output is privately produced for single clients, or 'syndicated' for groups of clients. This private arrangement means that the market research firms concerned know their clients' interests in advance and seek the particular information which is requested by those customers. In contrast, report publishers have to guess the interests of potential report buyers. In interviews, these report editors mentioned that they were always trying to gauge what material would sell. This situation structures which areas are covered and which questions are asked. In practice, the result would appear to be that market researchers collect a fairly regular set of information about certain categories of sales and sample data across all products. Occasionally, they add extra items on such themes as 'attitudes to products', which in researchers eyes make the reports more interesting (6).

A second filtering process which influences which statistics are widely available arises from the fact that only a selection of this published market research is bought by libraries (7). This selection reflects the lower end of the research market, where reports cost hundreds of pounds. The more expensive analyses can cost thousands of pounds.

Market research publishers mainly sell their analyses rather than original data, since many of their figures which they cite are of a secondary nature. These companies re-report statistical information either from sources such as other market research or from trade association figures. However, the report writers adjust sales figures for a variety of reasons. Only a few of these publishers carry out original surveys of users. The Henley

Centre has its own survey arrangements, while Mintel, and more occasionally Euromonitor and Marketing Assessment, commission some of the bigger market research companies to carry out surveys on their behalf.

Sometimes, it is possible for academic analysts to obtain primary data from the market research firms which are geared to private clients. In my own previous research (Haddon (1988)), most research firms which I contacted did not reply to enquiries about whether they would be willing to supply 'old' market research statistics concerning home computer usage. However, one market research company was obliging, and provided figures which covered a wider range of questions, over more frequent time periods and in more detail than all the other market research which I had gathered over the previous few years.

One means by which otherwise 'unavailable' published research statistics are made public is through the press releases to the trade media which constitute part of promotional strategies of publishing firms (although British companies seem less willing to provide such items than their American counterparts (8)). Journals such as 'Computer Trade Weekly' or 'Marketing' occasionally report some figures. However, this occurs very haphazardly and tracing such items can be labour intensive.

A more useful option is offered by publications such Screen Digest, which regularly trawls the press and industry publications for such material. The indices of this publication facilitate searching, especially with the co-operation of the editors. As a journal known for this approach, Screen Digest is sent regular details from media reports. It also actively seeks information from the research departments of electronics firms, with at least some success. The major drawback with these titbits of data is that the reader often has no idea how the figures were reached. However, such items may include figures which are absent from more accessible published research (9).

III. SALES DATA

A. MEASURES OF SALES DATA

A wider range of market research estimates of Video Cassette Recorder sales data have been made public than for other consumer electronic products (10). Hence, these figures are used to illustrate the various measures of sales discussed in this section. Table 1

contrasts the various measures of market size by volume through examining sets of figures from the same research company.

Table 1 MEASURES OF MARKET SIZE BY VOLUME: VCRs

Measure of Volume ('000 units)	Year			
	1982	**1983**	**1984**	**1985**
Deliveries to the Trade		2800	1410	1660
Consumer Off-take	2080	2180	1505	1620
Apparent Consumption	2340	2380	1290	2040

Source: Key Note
(The key to abbreviations for market research firms and trade associations is contained in Appendix 1).

'**Deliveries to the trade**' measures how many units of a product have reached the distributors and retailers (11). The producers concerned indicate how much product has been shipped out from factories based in this country. In the case of VCR's, the trade association Brema collects such information from its members, along with production and stock figures. Estimates then have to be made of the 'deliveries' from non-members. Lastly, the calculation of 'deliveries' involves adding imports and subtracting exports. More sophisticated research assessments also estimate the amount of re-imports and re-exports.

This import/export statistics are themselves known to be problematic. Even among those who work in the industry there may be differences of opinion over how to classify some products. For example, should CD players be counted separately if they are within a combined music system? Or should products be categorized as a complete units or a kit of parts if some degree of assembly work remains to be done? Customs and Excise staff deal with such an enormous range of products that they inevitably possess limited expertise in particular fields such a consumer electronics. Hence, finer distinctions, such as those which exist between video cameras and camera recorders, are liable to be missed.

'**Consumer Off-take**' is the most common measure of market size by volume. It indicates how many units of a product have been sold to the consumer. The VCR is one of those products for which a rented sector exists, so some analysts separate rented figures from sales ones - (the National Television Rental Association can provide the rental figures). More often, the sales and rented figures are combined in this 'Off-Take' measure. Another consideration is that for some products it can be difficult to distinguish sales going to commercial or institutional users from those entering domestic settings. This differentiation is often absent in official statistics. The problem is not so great for VCR'S, where different models are geared to specific markets. But separating these sales data has been noted as a problem in the case of items such as home computers (12).

To assemble consumer off-take data, Brema monitors a panel of shops. (This panel is considerably smaller than those maintained by the major client-orientated market research companies such as AGB). A general problem with retail panels is that there is no complete list of retailers exists. In particular, it is difficult to compile one for the smaller shops. Thus, judgement is involved in deciding the representativeness of any sample, and then evaluating what allowances to make for the sales made though underrepresented outlets. Brema acknowledge that their panel overrepresents the major multiple retailers, and that they have to judge their weightings accordingly.

It is clear that there is scope for divergences between 'deliveries' and 'off-take' estimates because of the different means of measurement involved. In addition, some variation between these two types of data is caused by the fact that the deliveries figure consists of sales plus stocks held by retailers and distributors. When we take the effect of time periods into account, we can appreciate a cause of difference between figures shown in the above table. For example, in 1983 there appear to be more deliveries than sales. This could be partly produced by an increase in the stocks held by retailers. In 1984, the reverse position of greater sales than deliveries could reflect the fact that retailers have decreased their backlog of stocks from the previous year.

'**Apparent Consumption**' is a less common measure of market size by volume. Here, home production figures are added to those for imports and then the figure for exports is subtracted. This measure may be the only option in cases where manufacturers are only willing to release production statistics, but not the figures for deliveries. However, 'apparent consumption' is regarded as being a much cruder measure than the other two, since it conflates sales not only with stocks held in shops, but also with stocks maintained by manufacturers. Once again, a time factor which can produces differences from the other measures. Manufacturers may be increasing or decreasing the stocks at their factories in a given time period. This then has an impact on the apparent consumption figures but not on the other measures of market size. Some market researchers, such as analysts working for Key Notes, argue that 'apparent consumption' is a good enough measure to reveal trends (13). To an extent, they would appear to be correct for VCR's in that upturns and downturns in sales occur across all three measures. But the changes are certainly far more volatile for this last estimate.

Generally, the advantage of these measures of volume is that they allow analysts to estimate consumption without having to worry about the effect of price differences between brands and of price changes. Market size by volume also provides the basis of the widely used figure for 'household penetration'. However, in these measures of volume many different brands are classified together, even if their are vast differences of quality between them. In contrast, market size by value is a measure which takes into account the different type of product which are sold, in effect providing a form of weighting by price. In some product sectors, such as that for photographic film. it is usual to give only value figures. But primarily, measures of value achieve their importance because they facilitate comparison between different product sectors. Using this measure we can, for example, discuss how hardware and software growth compare. In this respect, value provides a form of standardisation in terms of money.

Table 2 COMPARISON OF VOLUMEN AND VALUE MEASURES: VCRs

Measure of Value	Year						
	1979	**1980**	**1981**	**1982**	**1983**	**1984**	**1985**
Market Size by Volume Consumer Off-take ('000's)	155	410	1035	1900	2180	1500	1600
Market Size by Value Retail Value (£m Current rsp)	60	155	375	650	720	620	640

Source: M.S.I.

In Table 2, the two main forms of measurement depict similar growth rates for the VCR market. This need not be so for all products. For example, if the proportions of more expensive units increased, this would be reflected in a rise in figure for market size by value, but not in the figure for volume. Alternatively, if decreased prices through reduced costs of production stimulate sales, market size by volume will rise faster than size by value.

There is once again scope for variation in the value estimates. The basic calculation of value involves multiplying a volume figure such as consumer off-take by some average price. In fact, there are several types of average price, including the manufacturer's price, which can be valued at ex-works Japan, or on the dockside in the UK. The more common measure is that of retail price, but even here we can chose to look at figures before and after discounts. Most analysts try to achieve some standardisation by quoting retail price before discount - 'rsp' or 'retailer sales price'.

The other influence on value figures is that of the more general change in retail prices. Sometimes, the apparent growth which is shown in value figures may simply reflect the influence of inflation. Market researchers occasionally try to take such a general price change into account in order to show 'real' growth in value, but even here there is more than one way to calculate this figure. For example, allowance can be made by taking the Government's figure of changes in the retail price index. Alternatively, analysts can utilise the average price of a VCR from a base year. Table 3 shows such a base year estimate of real growth compared to the more common 'current' rsp figure.

Table 3 COMPARISON OF MARKET SIZE BY VALUE: VCRs

Measure of Value	Year				
	1981	**1982**	**1983**	**1984**	**1985**
Retail Value (£m Current rsp)	550	980	990	540	700
Retail Value (£m 1980 rsp)	492	807	779	405	352

Source: M.R.G.B.

The final important measure of consumption is 'household penetration'. This figure can be reached by using both sample based and sales based statistics, which will later provide a useful way to compare the two forms of data collection. For the moment, this section considers how the sales based version is formulated.

'Installations in use' figures form the basis of the penetration measure. Installations data are initially derived from cumulative sales figures. Yet, this paper has already indicated the basis for different estimates of sales in any one year - which leads to concomitant discrepancies between market researcher data. Consequently, there are grounds for variation in cumulative sales, since this figure is simply the sum of estimates from previous years.

Table 4 MARKET RESEARCH ESTIMATES OF INSTALLATIONS IN USE: VCRs

Source	Year						
	1979	**1980**	**1981**	**1982**	**1983**	**1984**	**1985**

Brema	200	600	1500	3600	5700	7200	8500
F.T.		650	1650	3750	6000	7000	8000
E.I.U.	250	575	1200				

In addition, some allowance has to be made in the 'installations' figure for those households which replace products. Not all sales constitute instances where products are constantly reaching households for first time. Where a market such as that for television sets is near 'saturation', most sales are in fact replacement ones. However, the amount assigned to replacements is itself an estimate, which is often based on guesswork about 'product life', (although the evaluation can occasionally be informed by the results of surveys). Again, there are clearly grounds for different estimates, as illustrated in table 4 above.

'Household penetration' refers to the proportion of households which have one or more of a product in the home. This measure initially entails a simple calculation of installations divided by the number of UK households - the latter information being obtainable from official statistics. But then some additional allowance must be made for households which have more than one unit of a product in order to avoid double counting. Second VCR's may be rarer, but for some products such as TVs , multiple possession is becoming an important consideration. Finally, analysts have to subtract some estimate of those products which were once sold to households but which are now no longer used - for example, through being broken but not replaced. Once again, the existence of some many decision points provide the grounds for variation in estimates of the penetration figure (see table 8).

B. **TRADE ASSOCIATIONS AND MARKET RESEARCH**

Trade associations often collect and publish data. Examples of such associations include Brema covering brown goods, Amdea covering white goods, the BPI covering pre-recorded software from the music industry and the BVA covering videogram production. An example of an organisation collecting statistics for a more narrowly defined market compared to the above mentioned agencies would be the Microwave Oven Association. In addition to these bodies, some statutory authorities collect statistical information for specific product or service areas, an example of which would be the Cable Authority. Many of these bodies also make use of Government statistics in some of their calculations - for example, they regularly use Customs and Excise figures on imports and exports in calculations of the supply of products to retailers.

Table 5 MARKET RESEARCH ESTIMATES OF MARKET SIZE BY VOLUME FOR VCRs

Source	Year						
	1979	**1980**	**1981**	**1982**	**1983**	**1984**	**1985**
Brema	115	350	970	2080	2180	1505	1620
Key Note		350	970	2080	2180	1505	1620
M.S.I.	155	410	1035	1900	218	1505	1600
M.R.G.B.			1035	2235	2160	1411	1660
E.I.U.	135	350	800	1800	2300	1700	
Mintel	200	400	900	2100	2250	1500	1600

NB The above figures represent sales+rented VCR's

Market research Company	**Source Quoted**
Key Note	Brema Annual Report
M.S.I.	Trade Estimates/ M.S.I.
M.R.G.B.	Brema/ Euromonitor
E.I.U.	Industry Estimates
Mintel	Mintel and trade estimates

The trade association figures are utilised by market research companies, as can be seen from sources quoted for the table below. But as can be seen from the actual figures, there is some variation in the final estimates calculated by the research companies:

The way in which market research companies formulate their reports varies. Some may base their figures on feedback from a programme of interviews with a range of producers, whereas others rely more heavily on information from trade association and on the official statistics concerning sales and production such as those produced by Business Monitor. In either case, market researchers can find grounds for altering these figures.

Before considering their motives for doing so, it is worth noting some of the difficulties which readers of market research face when evaluating report estimates. Sometimes reports provide clues about the factors shaping researchers' evaluations. But usually, it is not totally clear how the figures were reached. Furthermore, the process is not easily

checkable in cases where freelance staff have been employed to write the report with only very general monitoring by the report editors - as opposed to reports where research is conducted in-house. The personnel who write the reports also vary in experience. Some are assigned the job with a relatively limited knowledge of the field, while others, such as journalists, may have monitored the industry for some time (14). Finally, the whole exercise of analysis is conducted with different degrees of rigour (15). Yet from the reader's viewpoint, it can be very difficult to distinguish the status of different market research analyses.

C. TRADE ASSOCIATION COVERAGE

There is a difference in the extent to which trade associations represent producers in an industry. In the case of VCR production, Brema members account for a clear majority of all sales, and so the association has relatively good coverage of the product area. This may partly reflect the structure of this particular industrial sector: there are a limited number of larger producers of VCRs, 12 of whom are in Brema. Where there are many small producers, as in the case of the home computer peripherals market, organising a representative trade association can be more difficult. Official statistics concerning fragmented markets are also problematic since publications such as Business Monitor only count production from firms having 50 or more employees . This would eliminate a sizable proportion of an industry consisting of small scale operations. On the whole, the market research firms who were interviewed thought that reliable software figures are generally more difficult to obtain than hardware ones because of the different industry structures. Having said that, since the BVA represents 24 distributors, it actually covers virtually all sales data for pre-recorded videograms (16).

Trade associations also work under certain constraints as regards what statistics they can release. If there are only two manufacturers of a product, Brema cannot release the aggregate data on the production or supply figures which the association has received since each firm can then calculate the position of its competitor. (The Government's Business Monitor follows the same policy). Another constraint is that members may not wish for certain figures to be made available. For example, to calculate the market value of products more precisely, it would be useful to have data on the different models being produced and sold. Brema members made the decision not to supply information in such detail. If we move outside consumer electronics to take an example from the film industry, the companies concerned did not want to release aggregate weekly figures on cinema earnings since the success of new releases could be gauged through examining this measure (17).

In fact, trade associations do not only use information supplied by their members. Apart there use of official statistics, they sometimes have a joint arrangement to exchange information with other bodies - for example, Brema exchanges data with the National Television Rental Association (18). In order to calculate the input of non-members, the

research departments of firms participating in Brema arrive at some consensus in their estimate of these particular competitors' sales figures.

D. DIFFERENCES BETWEEN MARKET RESEARCH FIGURES

The variation between different market research estimates is itself different for the various measures of consumption. For instance, there is much less variation in estimates of deliveries to the trade. In fact, when we look at the source which market research firms quoted for this figure, it appears that Brema figures are regarded much more authoritatively on this issue than in the case of 'off-take'.

Table 6 MARKET RESEARCH ESTIMATES OF DELIVERIES TO THE TRADE: VCRs

Source	Year						
	1979	**1980**	**1981**	**1982**	**1983**	**1984**	**1985**
Brema	155	410	1035	2235	2160	1411	1659
Key Note		2840	1410	1660			
Mintel	410	1035	2235	2160	1411		
F.T.		410	1035	2235	2160	1411	1659
E.I.U.	165	400	1050				

This consensus reflects the fact that fewer factors external to the data from Brema's members enter into this calculation. By comparison, there is most variation in the estimates of market size by value, with some companies choosing to construct their figures according to a totally different format from others - rendering the statistics incommensurable.

Table 7 MARKET RESEARCH ESTIMATES OF MARKET SIZE BY VALUE OF VCRs

Source	Year						
	1979	**1980**	**1981**	**1982**	**1983**	**1984**	**1985**
Key Note				1000	500	575	
M.S.I.	60	155	375	650	720	620	640

M.R.G.B.			550	980	990	540	700
(a) E.I.U.	55	124	274		850	890	
(b) Henley(Rented)			169	313	461	490	546
(Sold)			186	436	439	392	403

(£m current rsp)

(a) Other companies calculate the value of rented videos by assuming the value is equivalent to purchase price. E.I.U. calculate the actual rental income.
(b) This may be based on Henley's own survey data - it is unclear how this is calculated.

In addition to the grounds for dispute which have already been discussed, there some other factors behind the pattern of variation in market research estimates. One point. made clear from some reports and emerging in interviews with market researchers, is that some analysts do not fully understand how the trade association figures are themselves constructed and so these researchers would appear occasionally to make inappropriate adjustments. On the other hand, there are more legitimate bases for disagreement over matters such as how much non-trade association members produce, or how to adjust official statistics which are known to have failings. Also, producers in different sectors vary in their willingness to give information or communicate with each other in any capacity (19). In such cases, there is greater scope for variation in estimates than if one single 'authoritative' source exists.

While the trade associations might well argue that it is in their members' interests to supply correct information as a basis for overall market evaluation, market researchers are occasionally suspicious of company claims. Overclaiming brand share is thought to occur, be it for reasons of presentation internal to the company, or in an attempt to promote a successful image to outsiders (20). Obviously, these claims are more difficult to check when there are no central agencies collecting data on the whole market. An example of this would be the case of blank tape sales (21). Where there is some check, as in the case of the cable TV authority, some of the discrepancies become visible. The figures released by each cable operating add up to a total greater than Jiccar's figures for the whole industry (22)!

Another factor which can create divergences in estimates is simply the time of year in which the market research analysis is conducted. While all reports give estimates for the whole year, those produced earlier are based on less data from which to extrapolate than those reports which appear later in the year (23). Also, the previous years sales figures are more difficult to ascertain for reports which are produced in the spring, given that it

takes some time for the sales returns from the vital Christmas period to filter through the system.

Finally, there are simply cases where researchers do not consider a set of figures to be plausible (24). Such instances attract more discussion in the trade press than in actual research reports. An example of how this assessment of 'inplausability' is made can be glimpsed in the way in which Screen Digest extrapolated from Business Monitor statistics for VCR's to show that prices calculable from the official data details bore no correspondence to the known prices of these products (25). Such comparisons have also been used to cast doubt on market research estimates.

E. THE PROCESS OF CONSENSUS FORMATION

It would be tempting to a a market estimate is more accurate if different research firms agree on approximately the same figure. Some interviewees from market research firms suggested that this is likely to happen where a product area matures. There is more market research on these commodities, and the statistics become more reliable. However, while this may well be one process at work, there are other mechanisms which help create a degree of consensus. It is important not to take consensus as being a straightforward sign of validity. Instead , we need to examine the causes of agreement as much the reasons for divergences.

One interviewee described the industry's treatment of estimates as follows (26):

> *'Once a figure is floated into the market other people pick it up an assume it comes from an authoritative source. So suddenly a figure which can be made up can become a truth because everybody believes it to be the case.'*

There are several layers to this process. First, market researchers look at each other's reports. This constitutes part of their search of written secondary data in the initial 'desk phase' before a larger programme of interviewing. Along with other sources, the figures from these other reports form one source of evidence from which market researchers then compose their own calculations.

The figures from past reports play an even larger role in those fields which have not yet received a great deal of attention from market research: i.e. new product areas. Generally, if there is little previous research, and perhaps no trade body producing figures, then the first reports to be written about a product area provide and important baseline for subsequent work. For example, although not a market research firm itself, Screen Digest ventured some estimates when it first started producing analyses of a new product area in the 1970s. Subsequent reports from research firms and media arrived at identical figures. This was unlikely to occur if these other estimates were calculated independently from Screen Digest's suggestions. The paucity of evidence at this time meant that different estimates were to be expected (27).

Apart from this fairly direct form of influence, there are more indirect ones. Manufacturers read both the cheaper, more available reports and the more expensive ones. When a market research firm later interviews these producers, the manufacturers' estimates can in part reflect the figures which they have already seen. While this was mentioned by several of my interviewees, the general point is illustrated by a market research firm which operated in a (non-electronic) product area where. The research firm had been produced the only previous report in this area. When the firm interviewed manufacturers for a second report a few years later, the producers quoted the market research firm's own previous forecasts as being the actual sales figures for the industry. The research firm in question considered that it was highly unlikely that its predictions could have been so accurate. Here was a self-fulfilling prophecy, with producers using past forecasts as a guideline to the present state of affairs (28).

Lastly, we have the role played by the media in this process of consensus formation. Researchers recognise a common industry attitude to statistics that 'once they're in the trade press, they've got to be true' (29). One interviewee described the process which he felt occurred particularly under conditions where a product had attained a high media profile (30):

> *'They'll be a lot of people quoting data. Generally the media seem to come to a consensus and try to quote the same figure. Once the same figure is quoted all over the place, this gives it such credence that the industry itself will actually believe it. When you go to talk to manufacturers (in a programme of market research interviewing) they will quote that figure. So you don't necessarily have to look at old reports...because the industry will quote them back to you!'*

In other words, the media play an intermediary role in influencing producers through this re-reporting of figures, as well as having a more direct influence on researchers by citing estimates which constitute a written secondary source (31). As a degree of consensus is formed through these processes, the above interviewee noted that market researchers might themselves lose some credibility if they stray too far from the 'established' estimates:

> *'If you quote something different from that, you'll be stepping out of line, and you've got to be brave to do that.'*

The processes described here are not that dissimilar from those in other fields of sociological study such as deviance. Whereas the early part of this section drew attention to the more technical factors shaping the construction of estimates, the above discussion has indicated the status which statistics can be assigned and how these figures circulate among various agencies.

In fact, when presented with the range of VCR statistics which appeared in this section, market researchers thought that the consensus was quite high compared to some of the product areas which they had seen. But as one interviewee observed, this may have been

because Brema was generally regarded in a very positive light (despite the fact that market researchers altered the association's data). While that evaluation may be justified by reference to the nature of Brema's coverage and to the technical procedures which it uses, that 'authoritative' label may be influential in its own right.

There are clearly limits to the range of figures around which a consensus could evolve. Producers and retailers constantly take measurements from which any consensus cannot diverge too outrageously. However, this section has noted that there are also some fundamentally 'grey' areas concerning how to interpret these measures, which gives scope to some of the processes of re-reporting and mutual influence which have been outlined above.

IV. HOUSEHOLD PENETRATION: SALES AND SAMPLE DATA COMPARED

Table 8 shows some of the household penetration figures for the VCR. These are derived (a) from trade estimates of sales based data and (b) from various large samples of broadcasting and official consumer surveys. The causes of the variation between the sales estimates - as well as convergences - have been discussed in the previous section. What is of interest here is the broad difference between sample and sales statistics.

Table 8 HOUSEHOLD PENETRATION FIGURES: VCRs

Source	Year							
	1979	**1980**	**1981**	**1982**	**1983**	**1984**	**1985**	**1986**
Sales Based								
Brema	1	3	7	17	29	35	40	49
Screen Digest						38	44	51
Key Note		2	6	13	22	24	40	
M.R.G.B.			8	19	29	35	40	
E.I.U.		1	4	16	22	35	41	

F.T.	3	3	19	30	35	40	
Mintel		4	16	22	30	37	

Sample Based

BARB	1	2	7	16	23	28	36
GHS	-	-	-	18	24	32	
FES	-	-	-	-	-	30	36

The sample data shown here are derived from very large surveys (10,000 and 20,000) and so there are mathematical reasons why we should have confidence that the figures generalise to a wider population. Yet, as Screen Digest has noted, a consistent difference between sales and sample data for VCRs has been apparent for some time and has also shown up in other surveys which are not discussed here. The discrepancy amounts to several million VCR units. Furthermore, although there are fewer statistics available for other products than for the VCR, we can note a somewhat similar difference between sales and sample data in the case of home computers (Table 9) and Teletext TVs (Table 10).

Table 9 HOUSEHOLD PENETRATION FIGURES FOR HOME COMPUTERS

Source	Year				
	1982	**1983**	**1984**	**1985**	**1986**
Sales Based					
Mintel	5	13	23		
Keynote		7.5	10	14	18
M.R.G.B	4	12	18	24	
Sample Based					
Barb			8	12	15
GHS			9	13	

FES	13	15

Table 10 HOUSEHOLD PENETRATION FIGURES FOR TELETEXT

Source	Year					
	1981	**1982**	**1983**	**1984**	**1985**	**1986**
Sales Based						
Brema	2	4	7	10	14	19
Mintel	1	3	7	12		
Sample Based						
Barb	1	2	5	9	11	15

One key factor behind this consistent difference between sales and sample data is the time period to which the statistics refer. Even though there are problems in formulating trade estimates, all sales figures are at least intended to refer to calculations for the end of the year. Thus, if we wanted to find a strictly comparable sample of consumers to check against the 'sales estimates for 1985' we would look for a survey which had been conducted at the end of December 1985, or the start of January 1986.

In fact, the surveys cited above take place at different times of the year. The earliest is the Barb's Establishment survey, the data for which are normally collected in March. So, when a figure from Barb is quoted as the 'household penetration for 1985', that statistic is really nearer to the equivalent 1984 trade figure (plus an allowance for the first quarter of 1985). Hence, we would expect Barb results to be smaller than trade estimates, lagging almost a year behind. To a large extent this is the case.

The GHS and FES data are collected throughout the year, the final statistics representing an annual average. If we were to assume that people buy products evenly over the year, these official statistics would really be the equivalent of those from a mid-year survey. However, one major consideration for all consumer electronics is the sales increase during the Christmas period. This implies that, other things being equal, these official statistics might often be the equivalent of data from a survey taken after the middle of the year. The general corollary is that we would expect Government figures to be higher than the Barb results.

The issue is complicated still further by the fact that different products realise different proportions of all sales at Christmas time. In its first years on the market, the vast majority of sales of home computers occurred during this season. Admittedly, it is not always the case that items simply sell best at the end of the year. Video games sales

decreased very suddenly and experienced one bleak Christmas season when micros started to become popular. But, in the case of the VCR figures shown above, the BBC pointed out that its unpublished Omnibus surveys which are conducted throughout the year certainly suggest a seasonal factor. There were increased sales of the VCR in latter half of 1985 and to some extent in late 1984.

It is beyond the scope of this report to go into greater detail as to why differences between figures occur. For example, we would have to know good deal more about the procedure by which surveys are conducted. On the sales data side, the estimate of replacement purchases is important in the calculation of household penetration. This replacement figure changes during the products lifetime, and we would certainly need to examine in more detail how this estimate is reached. And finally, despite the arguments put forward by some trade associations, we cannot rule out the possibility that some of their members are overclaiming sales.

What is the best policy to follow in the face of these varying statistics, especially if the pressure to chose a figure quickly prevents investigation of how particular statistics are constructed? Clearly, one key point which emerges is that we need to be sensitive to the period when data are collected. This means citing the particular month if quoting survey statistics, rather than claiming that penetration figures apply for the whole year. On the other hand, if the interest is in how household penetration varies for different years, it seems most appropriate to follow the trade convention and cite end-of-year figures.

With a few exceptions, most figures from either sales or sample data are sufficient to indicate the overall trend in consumption, even if slightly different gradients and fluctuations would appear when the statistics are represented in graph form. Having checked that a particular set of figures are not outrageously different from others, another strategy would be
(a) to report the data concerning penetration over time from only one research body;
(b) to indicate the degree of variation between its figures and those of other sources in this particular case;
(c) to say in more general terms how the source which has been chosen stands in relation to the others in the field. For example, if Barb figures are used, then it should be noted that these are always at the low end of the range of statistics available.

Whatever strategy is used, it is important to indicate how choices were made in relation to the other options available.

V. SAMPLE DATA

This section first examines the nature of sample data generally, and then explores three broad types of survey generated statistics: those on ownership and buying/renting of products; on usage of commodities and services; and on attitudes to these products. This last category is based on what respondents say about ICT items rather than on any

behaviour, and includes intention to buy, reasons for buying of not buying, and interest in the products. The case study of statistics relating to home computers discusses these various dimensions further.

A. **DEMOGRAPHIC PROFILES**

Profile Formats

The tables below demonstrate the two ways in which demographic profiles can be arranged. The figures shown would normally be part of much longer list of statistics showing gender, age, region and other variables by which respondents' answers to the survey could be classified. However, the figures given below concerning socio-economic groups are sufficient to demonstrate how the two types of profiles operate.

Table 11 DEMOGRAPHIC PROFILE FORMATS

	Home Computer Owners
	%
All	15
AB	25
C1	19
C2	15
D	10
E	7

Source: Mintel 'Home Computers' 1985

Table 11 shows the most common format which is used in market research, official statistics and academic work. The figure for 'all' (respondents) indicates that 15% of the sample participants owned home computers. The figures for class then arise from a division of the sample into sub-samples of ABs, C1s etc. Of the ABs in the sample, 25% were owners; of the C1s in the sample, 19% were owners - and so on. The implicit question is: 'what proportion of ABs buy home computers compared to the proportion of C1s, C2s, Ds and Es who do so'. In other words, this format illustrates the different

degrees of 'interest' expressed in these machines by different groups, as measured by possession.

Table 12 DEMOGRAPHIC PROFILE FORMATS

	National Profile/	Home Computer Buyers
	%	%
AB	17	21
C1	22	27
C2	31	37
DE	30	15

Source: Marketing Assessment 'Home Computing'
1986

In table 12, the first column gives a national profile of the population by gender - ie what percentage of the UK population are ABs, C1s etc. In the second column, we see that 21% of the home computer owners in the sample were bought by ABs, and 27 % of the home computer buyers were C1s etc. The implicit question: 'what is the class composition of the sub-sample of owners'. In this case, by glancing along the AB row to the national profile figure, we can see that the ABs are overrepresented as home computer buyers, while DEs are greatly underrepresented.

Obviously the tables measure different factors - buying versus ownership - and the sample data are based on surveys conducted in different years. However, a general knowledge of this market suggests that the proportions would not be vastly different if the surveys had both related to ownership (or both to buying) and had been conducted in the same year. If this were to be the case, the first table would show that, as a socio-economic group, the ABs were the most interested in these machines. But, they are only a relatively small group in numbers compared to some of the other classes. The merit of the second profile is that it takes this difference in size into account, showing that other classes - C1s and C2s - literally buy more of the machines.

Variables

Surveys almost universally use socio-economic groupings as a variable. However, there are still incompatabilities between different sets of sample data because some surveys collapse class categories (such as D and E) due to the small number of respondents involved. It is usual to merge responses from social class A and B for this same reason,

although bigger samples such as those used in official statistics can treat these categories separately.

As regards possession of facilities, surveys which regard the household as there unit of analysis - e.g. the Government's Family Expenditure Survey - do not distinguish gender and age as separate variables. The merits of this emphasis are discussed later in relation to home computers. In contrast, most market research reports analyse their ownership data according to gender and age. The sex of respondents is certainly noted by all surveys which examine usage or activity. One exception within market research is that for certain categories of product, answers from only one sex are sought on the grounds that these respondents are thought to have a greater knowledge of the products role in the household. The main example of this policy in relation to the concerns of this report is the field of white goods, where only a female sample is sought. In the case of age, some incompatabilities between surveys arise because analysts employ different age ranges when categorising sample member responses.

The next most common variable is the area in which respondents live. Once again, incompatabilities exist because the regions which are referred to in surveys are organised differently. Market research firms utilise commercial TV regions since these provide a guideline to where their clients might advertise. It should be noted that these regions have considerable overlap. Meanwhile the BBC usually refers to BBC television regions and official statistics draw on boundaries defined by the Electoral Register. The Government surveys provide details of actual numbers involved which allows readers to attempt some manipulation of the official figures in order to reconstitute the data into areas very roughly comparable with one or other of the TV regions.

Other, less common, variables relate to whether households have children or not, to the marital status of respondent, and whether they are working or not working. Market researchers occasionally employ the Acorn classification system which refers to housing and neighbourhood types, although this form of analysis really require slightly bigger sample sizes than are available for most surveys. We have already noted that official statistics show household composition, house tenure and incomes in considerable detail (see p.9). The Mass Communications project also considers educational level and qualifications attained. For some consumer electronics, one recently used variable is the number of TVs possessed, while surveys of white goods have categorised respondents according to the other kitchen articles which they possess. In effect, this approach starts to examine correlations between facilities available - a point which will be discussed later.

Apart from these basic variables, a very few market research companies have experimented with lifestyle, as opposed to demographic, categories. This lifestyle analysis relates to advertising conceptions. For example, marketeers have theories of how brown good percolate through the population, first being taken up by characters called 'innovators', followed by 'achievers' and then others. However, there is little agreement on well-defined uniform lifestyle categories - after all, what are the defining characteristics of a 'Yuppie'? Lifestyle analysis is not yet publicly available.

B.**DIFFERENCES BETWEEN SAMPLE DATA**

The tables below illustrate many of the previous points. In addition, these sets of statistics reveal the degree of variation which can regularly be found between samples. (In fact, it is not easy to find surveys which are closely comparable. For example, VCR figures were incommensurable because some sources produce separate ownership and renting profiles, while others simply show figures for availability. So in table 13 we examine two market research surveys on microwave oven owners).

Here we see an example of a survey which focuses solely on women in the household, and where we have slightly different categories which render some figures for age and class incomparable. In term of variation, the two sets of statistics show a slightly different picture for the effect on ownership of the presence of children and of socio-economic group. While some of this variation can arise from the different dates of the surveys, comparison with other surveys suggests that this is likely to be the degree of variability which we would anticipate even in the case of simultaneous surveys. In a second example, which refers to ownership of home computers, we see a comparison between surveys conducted by a market research firm, by the BBC and by a Government agency.

Table 13 COMPARISON OF SAMPLE DATA: MICROWAVE OVENS (32)

Possession of Microwave Ovens.

Category	**Mintel** %	**Category**	**M.R.G.B** %
All	16		14
Housewives with Children	15		15
Housewives with no children	16		12
15-24	(9)	16-34	(13)
25-34	(16)		
35-44	21		17
45-54	22		22
55-64	(19)	55+	(9)
65+	(5)		
AB	26		21
C1	18		17

C2	19		13
D	(12)	DE	(8)
E	(7)		

Source (Mintel) - BMRB/Mintel
Base: 925
Period in which fieldwork was conducted: December '86

Source (M.R.G.B.) - RSGB/Euromonitor
Base: 880
Period in which fieldwork was conducted: March '86

Note: the figures in brackets cannot be compared.

Reference: Mintel Market Intelligence, March 1986, p.81
Market Research Great Britain, December 1986, p.22.

Table 14 COMPARISON OF SAMPLE DATA: HOME COMPUTERS (33)

Percentage of sample possessing a home computer

Category	Market Research Survey March 1985 %	Category	Broadcasting Survey 1985 %	Official Statistics 1985 %
All	15		19	13
Men	16		16	
Women	14		13	
15-19	(32)	16-24	(19)	
20-24	(11)			
25-34	14		19	
35-44	28		25	
45-54	19		14	
55-64	4		6	
65+	4		1	
AB	25		26	26
C1	19		18	17
C2	15		14	18
D	10	DE	(6)	9
E	7			9

Market Research Source
Base: 1034.
Period in which fieldwork was conducted: March 1985.

Broadcasting Research Source.
Base: Approximately 1000.
Period in which fieldwork was conducted: Throughout 1985.

Official Statistics Source (Class figures were recalculated).
Base: 9993.
Period in which fieldwork was conducted: Throughout 1985.

Once again we find a number of incomparable categories. In table 14, the Government's class statistics are recalculated to make them comparable with the other figures. However, this strategy is only viable to a very limited extent. The official statistics have a different procedure for classifying socio-economic group from that employed by market researchers. For the Government analysts, the 'economically inactive', such as students and those retired or disabled are categorised separately from the working and unemployed. It is only these latter 'economically active' respondent whose responses constitute the statistics for class. The effect is that all the GHS figures in the above need to be reduced by a few percent to take this into account, but there is not enough information to ascertain exactly what correction is necessary.

We noted in relation to household penetration data that the time of year in which surveys are conducted and the details of sampling procedure could have an effect on the figures produced. Later, we will also see the possible effect of the frameworks in which questions are asked and of the question wording. But in addition to all of these, there are mathematical reasons why the statistics from these samples would vary. Often this variation is only of the order of a few percent, but we need to be sensitive to how this changes the patterns reflected in the figures. If possible we should check the statistics generated from a range of samples if we want to have more confidence in the picture which consumption figures portray.

C. **POSSESSION DATA**

A problem with possession data which is not usually discussed in market research is whether individuals or families, households are the appropriate unit of analysis. For some 'personal' products there may be clear a individual owner. Perhaps personal stereos would he an example. But, other goods may have been bought communally, ‘for the family' - have an example might he the VCR. The case of the home computer provides an interesting example to explore a range of problems concerning possession data because previous qualitative research indicates that this product can fit into either individual or familial categories.

Some market research companies prefer to ask individual respondents only about their own possession and use of products rather than asking these interviewees for details of other household members. The firms regard such personal information as being mere reliable than secondary reports of the possessions and behaviour of others. In cases where respondents have bought a home computer for themselves or received it as a gift, there is no problem with this interviewing approach. But some micros have been bought for the family or for all the children.

Alternatively, micros may initially have been bought by one person for his- or herself, but since other household members use the machine, the family may have come to perceive these machines as being communal possessions**.** So, if a teenage girl or a boy says in response to market research questions that she or he owns a home computer, what is in practice a shared object now appears in the statistics as an age- and gender-specific possession. Hence profiles which assume individual owners can he misleading.

Conversely, even if there is an individual owner of the micro, an interview question about ownership may well he interpreted in familial terns. For example, even if a father had bought the micro mainly for himself, other family members might well interpret the question 'Do you own a home computer?' as being 'is there a home computer in your family?' That possibility is even clearer in the case of another common question which asks about possession 'do you have a home computer?'. Or to rephrase the point, the respondent may interpret 'you' as being plural. Thus, the researchers may he interested in ownership, but the respondent refers to availability. In this instance, ownership which should he registered in one set of statistics, (e.g. father's), appears in someone else's. Again, the profile figures can he misleading.

While the previous example was meant to demonstrate that the vague terms 'own, and 'have' may be interpreted as meaning 'have in the home'. this does not mean that a question employing these words will always be interpreted in this way. For example, a mother who is asked whether she owns a home computer may well reply negatively, even though there is one which her children use. This has an important ramification. We cannot adopt a policy of simply saying that data related to 'ownership' really measure accessibility or availability. The point is significant in the case of household penetration figures. Sample based household penetration figures are often derived from answers which individual respondents give to exactly the types of ownership questions outlined above. In this instance, the researcher assumes that the individuals responding to the questions are now representing and answering for their families. In other words, this approach assumes that respondents are commenting on the accessibility of micros. The case of the mother answering negatively illustrates the flaws in this supposition.

These phenomenological criticisms require us to know both what 'possession' means in households and how questions about this topic are interpreted by sample members. Market research firms may sometimes pilot their questions and explore such issues, as the textbooks recommend. But if they do, this is certainly not reported in the market research findings. Without that information, it is difficult to interpret the meaning of the figures which these companies present.

D. **BUYING DATA**

The processes by which ICT goods enter the home are clearly of prime interest to producers as well as to the academic community. Hence questions relating to this aspect of consumption find a place in market research. Such questions explore the reasons for buying micros and ask where products are bought. This sub-section examines some of the difficulties surrounding profiles of the buyer and asks what further questions it might be useful to pose about the buying process.

The first point parallels the discussion of possession data. Sometime, family/household groupings or couples are jointly involved in the act of buying in shops. If respondents then answer market research questions on buying, analysts may falsely register these collective acts as being purchases made by individuals. Alternatively. if someone else in the household bought the computer, respondents may still reply affirmatively to questions which really seek to discover whether they personally had, bought a machine - they may do so on the grounds that 'the family' had acquired a machine. In this case, the profile which emerges does not reflect the people involved in the immediate buying process.

There is another dimension which it is also important to note. Even if such a profile were to highlight those who literally visited the shops, such information may not do justice to the role of other family member who may have been involved in the buying process. First, there is the distinction between the initial decision to buy a product and the process of making that purchase - including going to shops. Second, there may be a difference between the decision to buy a product at all. and then choosing a particular brand. The profile of buyers found in a typical piece of market research might reflect mainly the later stage in each of the above distinctions.

Producers have recognised this issue of the negotiation which takes place during buying decisions. The theme has been explored in some of the private research which they commission. In the particular case of home micros, the problem of evaluating buying profiles was underlined when manufacturing companies differed in their interpretation of market research which showed overwhelmingly male buyers. Some producers took the figures at face value and focused their marketing on fathers. Others felt that women were rendered invisible by the research process. These producers considered that mothers played a significant role, even though they were rarely seen in shops and they did not appear in buying statistics Such firms were careful to address a female audience in their advertising (Haddon l988b).

E. **USAGE DATA**

Researchers regularly ask about the different uses to which domestic technologies are put where the artefacts concerned offer an element of choice. For example, in the case of television. respondents are usually asked to indicate the frequency with which they watch standard genres of programme such as documentaries, news, melodrama, etc. The equivalent categories of use are less settled in the case of computing. There may be agreement on some

classifications such as 'educational use', partly because the software literally has the word 'educational' written on its label. But where one survey offers the three headings 'home finances', word-processing' and 'storing information for personal uses', another employs the categories 'personal affairs/information' and 'other'.

In the particular case of home computing, sales and possession data have also been taken as guidelines to use. Joysticks have been by far the most commonly owned peripheral for some years, and the has been used to support evidence from direct questions on usage which indicate that games-playing is the dominant activity on these machines.

When researchers ask about the degree to which individuals use ICTs, the first general problem which arises concerns the importance of the context within which questions are framed. While data on home computers appear in reports which are solely devoted to micros, figures also appear in syndicated reports where questions are asked about a range of related gods. Questions on home computers appear in reports on TV usage in general, on the use of toys' puzzles and games and on participation in sport and leisure.

One consequence is that the question wording may alter slightly, giving a different meaning to the enquiry. For example, questions which ask whether people use TV sets in conjunction with home computers provide one measure of micro usage. But this measure excludes the possible users who utilise their own monitors whereas the reports which ask about micro, usage would include such users

Sometimes, while the literal wording of the questions remains the same, the changing context may alter the respondents' interpretation of the enquiry. Both the TV and games surveys imply that questions only concern activities in the respondents' own house. The sports and leisure surveys suggest that other locations can be taken into account -e.g. using micros at a friend's home computer, or in clubs.

It is possible to appreciate the difference which the question context might produce by considering Table 15. This lists a range of survey statistics showing the use of home micros by girls and boys:

Table 15: USAGE OF HOME COMPUTERS: 'EVER'

(See Appendix II for sources of home computer data)

Q. Do you ever use a micro computer? (In the context of asking how TV sets we used)

Source Code	Date of Survey	Age Range	% Male/ Female
CJ(d)	Nov'82	11-24	17/9
CJ(h)	June '83	7-19	10/6
CJ(k)	Dec '83	7-19	18/9

(In the context of asking about Sport and Leisure)

Source Code	Date of Survey	Age Range	%Male/ Female
CJ(g)	Feb'Mar '83	(boysl) 7-24	
		(girls) 7-14	17/18
CJ(i)	Aug'83	5-17	17/15

First, this set of figures highlights the difficulty of distinguishing separate influences because there are numerous factors working simultaneously In this case, different survey data are, strictly speaking, incompatible due to the age ranges of the sample, time and the question context. Of course, the analyst can draw on other background knowledge to try to make sense of the discrepancies, but the main point is that we can by no means rely on any one set of survey figures as being definitive. At best they may show broad trends such as the approximate ratio of male to female users in the Table 15 (between two and three to one).

Turning to the different measures of usage, Table 15 also shows one of the most common forms of enquiry, and one which produces the broadest positive response. This is the question of whether respondents ever use home micros. Of course, sample members might still reply negatively if they only used the micro once or a few times in the past - i.e. 'ever' may be taken to refer only to a certain recent time period. Allowing for this, we can nevertheless assume that the 'ever' question shows the extent of a minimum contact with the machines and so provides a first layer in our picture of usage.

The other common data refer to recent usage of the micro, whether the question specifies use during last week or during the last six months. Not only does this question occur in 'snapshot' one-off surveys, but it is also to be found in the on-going time use analyses conducted by some market research firms such as the Henley Centre. 'Recent usage' does not strictly measure 'regular usage'. Recent users would include, for example, those who have only recently acquired a home micro and who might have a different profile from earlier buyers. Yet, regular users might be expected to be well represented among recent users. Therefore, in lieu of better measures, it is feasible to treat recent use as a rough guide to those people who have a stronger interest in the machines. An example of some surveys results concerning the recent use of home micros is given in Table 16.

Table 16: USAGE OF HOME COMPUTERS: 'RECENT'

(See Appendix II for Sources of home computer data)

Q. Have you used a microcomputer In the last? days?
(In the context of asking about Games and Puzzles played or used in the home)

Source Code	Date of Survey	Age Range	%Male/ Female
CJ(b)	Apr '82	7-14	4/1

(In the context of asking how TV sets are used)

Source Code	Date of Survey	Age Range	% Male/ Female
CJ(h)	June '83	7-19	4/1
CJ(k)	Dec'83	7-19	12/4

(In the context of asking about Sport and Leisure)

Source Code	Date of Survey	Age Range	%Male/ Female
CJ(g)	Feb/March '83	(boys,) 7-24 (girls) 7-14	10/6
CJ(i)	Aug'83	5-17	10/4

In the field of home computing, questions which ask more directly about the amount of use are less frequent. These questions can be framed either in terms of hours per day, hours per week, or days per week. Unfortunately, when approaching this degree of detail, the number of cases in a sample becomes very small. If the market researchers ask 1000 people whether they recently used a home computer and 15% answer positively, then from those 150 affirmative responses it is legitimate to build up some form of user profile. However, if we then attempt to move on to a second stage and fit these 150 responses into those who use these machines once, twice, three times a week etc., further subdivided by gender, age and class then the end product is very small cell sizes.

Where the initial sample is very large, say 10,000, this is less of a problem. Alternatively, if a high proportion of the initial sample is not simply filtered out by the first question then frequency tables are once feasible.

An example here is the case of TV watching, where more than 90% participate. But in the case of home computers, while we may note the patterns generated in such tables, we cannot have any great confidence that the results generalise to a wider population. Some examples of survey results showing the frequency of home computer use are given in Tables 17 and 18.

Table 17: USAGE OF HOME COMPUTERS - FREQUENCY, DAYS PER WEEK

Source Code	CJ(c)		CJ (h)	
Date of Survey	Oct/Nov '82		June '83	
Age Range	7-l9yrs		7-l9yrs	
	Male	**Female**	**Male**	**Female**
Total sample size -	706	715	638	621
Total of replies -	29	12	64	41

Days per week -				
5 or more	7	1	16	3
3-4 days	6	0	11	2
1-2 days	12	6	2days& 3	7
			1day 14	10
Once a month	2	0	8	14
Less often	2	5	12	5

Table 18: USAGE OF HOME COMPUTERS - FREQUENCY, HOURS PER WEEK

Source Code	CJ (c)		CJ (h)	
Date of Survey	Oct/Nov '82		June '83	
Age Range	7-l9yrs		7-19yrs	
	Male	**Female**	**Male**	**Female**
Total sample size -	706	715	638	621
Total of definite replies -	27	11	54	34
Hours per week -				
1 or less	1	4	12	21
up to 2	2	2	15	5
up to 3	9	4	0	2
up to 4	-	-	5	2
up to 5	2	0	-	-
up to 6	4	0	9	2
up to 7	3	0	5	0
up tol4	2	0	5	2
up to 2l	4	0	1	0
up to 28	-	-	2	0
up to 35	0	1	-	-
D.K.	4	5	8	4

Although it is more usual to ask individuals about their own behaviour, some market research firms hare asked respondents to report what happens within their household. Such a strategy provides another way of trying to examine the degree of usage, but this too has its pitfalls. In research by Gowling Marketing Services, 'male heads of household' were asked to judge the main user of the machine. Obviously this question wording forces a choice of one person, and does not show the pattern of use of other family members. The results were as shown in Table 19.

Table 19: MAIN USERS IN HOUSEHOLDS WITH MICROCOMPUTERS

Family Position	Percentage of main users amongst families with micros
Husband/Father	36
Wife/Mother	3
Son	48
Daughter	8
Other/Dont Know	5

Source: GMS (a)

If we take Table 19 in isolation, fathers and sons are highlighted. Indeed, it is easy to jump to the conclusion that the statistics reveal a vastly dominant male interest in micros. Two years later, Gowling changed their format, asking about degrees of use of all family members. The results were as shown in Table 20.

Table 20: LEVEL OF COMPUTER USAGE BY FAMILY MEMBERS

Percentage Distribution

Family Member		Heavy User	Medium User	Light User	Non User
Husband/Father	(n=643)	9	21	40	30
Wife/Mother	(n=612)	2	6	30	62
Eldest Boy	(n=612)	48	35	13	4
Second Eldest Boy	(n=269)	43	35	18	4
Third Eldest Boy	(n= 49)	26	37	34	3
Eldest Girl	(n=381)	12	26	41	21
Second Eldest Girl	(n= 95)	17	24	39	20
Third Eldest Girl	(n= 15)	32	20	43	5

Source: GMS (b).

Some of the changes reflect the change over time. For example, there is reason to believe that fathers became less significant users over these years. Nevertheless, we can anticipate how the figures would have appeared if Gowling had stuck to their original 'main user' format - the usage by boys would probably have been stressed while the pattern of usage for girls. which we now see, would have been obscured.

F. **ATTIUDINAL DATA**

Clearly producers would like to know the extent to which interest in their products exists beyond current buyers since this forms the basis of possible future sales. Such data may also

inform some of the more theoretical discussions of the future of new technologies. For example, we might want to know whether new consumer electronics are universally attractive across class and other social divisions, in which case disposable income may be the main factor which will structure patterns of buying. Alternatively, goods such as home micros may have a more restricted appeal, being found desirable only by certain social groups and not others. Another level at which attitudinal measures might cast some light is in relation to processes within families. Certainly some clues about how products such as micros are experienced by different family members can be gained from data on usage. But, measures of wider interest can enrich this picture and help adjudicate claims such as the one that boys find home computers more attractive than girls.

Surveys which address adult respondents phrase questions about people's motivation in terms of the 'intention to buy' new products. In surveys which address a child or teenage audience, market researchers usually ask whether respondents would 'like to get' a micro - especially as a Christmas present. Such measures of desire help us to evaluate the gender issues outlined above. Table 21 indicates that although there is more interest among boys, girls also show a preference for the home computer to some extent

Table 21: PREFERENCE FOR HOME COMPUTERS

Q. Would you like to get a home computer?

(in the context of asking about preferred Christmas presents)

Source Code	Date of Survey	Age Group	Percent of Males/Females
CJ(a)	Dec81	7-17	8/3
CJ (e)	Dec '82	7-17 (boys & 7-14 (girls)	19/10

A second measure of interest relates to knowledge about home computers. As part of their role in supporting client marketing departments, market research firms sometimes ask questions about 'brand awareness'. Here, respondents are asked if they have heard of different brands of product. Admittedly, these responses cannot be taken as a simple measure of interest. Respondents who have not previously encountered these brands may nevertheless claim to have heard of them. For example, boys may do this more than girls, as part of the process of presenting themselves as being up to date with developments, if such knowledge is fashionable among young males
(26).

There are questions which combine elements of desire for products with knowledge of those items: as in the question of which brand of micro respondents would like to acquire. This also produces a wider range of positive responses from boys. Thus, there is a case for saying that knowledge - especially of more obscure brands - may reflect some interest on the part of

respondents. Presumably. if the respondents choose less well known models then they know at least something about those machines. Table 22 shows some responses to questions about brand preference.

Table 22: BRAND PREFERENCE - HOME COMPUTERS

Source Code	**CJ (f)**	**CJ(i)**
Date of Survey	**Feb '83**	**Sept'83**
Age Range	**7-14 yrs**	**7-l9yrs**
Make of Micro	**Male/Female %**	**Male/Female %**
Acorn	15/7	24/12
Atari 400/800	-	54/43
BBC Micro	28/15	43/29
Colour Genie	-	55/19
Commodore Vic	29/13	40/18
Dragon	25/8	43/21
Sinclair	33/16	(ZX81) 48/28
		(Spectrum) 51/31
Tandy	23/16	-
Texas	33/18	31/17
Commodore 64	-	46/29
Jupiter Ace	-	15/5
Lynx	-	14/6
Mattel	-	15/4
Orlc	-	29/9

Readership of product related magazines can also be interpreted as a measure of Interest, even if it does not directly ask about attitudes. This would appear to be a better measure of individual interest than the viewing data for product related television programmes (such as 'Microlive') which come from the regular Barb surveys. This is because qualitative studies by researchers such as Morely (1986) indicate that some family members - principally male - have greater control over the programmes which all the family members view. So while a proportion of viewers may watch computer related programmes if they happen to be showing on the channel which is tuned in, this may reflect only a very passive interest.

Market researchers not only ask about intention to buy but also about reasons for purchasing or not purchasing a procduct. However, some producers are aware of the pitfalls of such motivational data, often assuming that such answers measure 'justifications' for buying rather than 'real reasons' for purchasing (Haddon 1988b).

A final type of attitudinal measure is provided by research on TV programmes, such as the studies conducted in relation to the various series associated with computer literacy. These surveys asked what respondents wanted from such programmes. which may also cast some light on the nature of interest in the technologies concerned.

G. **CORRELATIONAL AND LONGITUDINAL DATA**

Correlational data chart the range of artefacts owned by the same household. Some very sophisticated versions of this type of data are available for the private clients of larger market research firms. For example, it is possible to find the correlation between possession of artefacts and reading behaviour (e.g. which newspaper is read). However, these type of data are less frequent in the case of published market research. To generate more interesting correlational data on the possession and use of new technologies it would be best to ask the same respondents about related products. But, a market research company such a Mintel addresses a variety of different producers in anyone of its monthly issues and so the firm asks the interviewees in a survey a very diverse set of questions, ranging from enquiries about lawn mowers to those about baby foods. Hence, the company never focuses an entire survey on an area such as consumer electronics. The BBC is not bound by such considerations, and does produce such data in its annual unpublished Omnibus survey. The Centre or Mass Communications Research has also collected this type of information.

As noted previously. the Centre for Mass Communications is responsible for the main longitudinal study currently being undertaken in the field of consumer electronics. While this study deals mainly with the VCR, Teletext and Home Computer, the research also takes into account a range of other ICT products. This Mass Communications Project specifically attempts to chart how the same families initially acquire new technological products and services, as well as how and when they may cease to use them.

Finally, this Centre's work also provides some of the few measures of the product related behaviour which takes place outside the home For example, the researchers have asked about respondents' contact with other people who have micros, in order to demonstrate that social networks structure different class experiences of this commodity. They have also asked about the exchange of software and attendance at computer clubs. This is a welcome departure in that most other research has tended to be home centred, (apart from occasional questions as to whether computers were used 'elsewhere', or also specifically used in school).

VI. FURTHER RESEARCH

A. **ABSENCES IN THE DATA**

Clearly, any gaps detected in the available statistics partly reflect the questions which are of interest to a particular analyst. With that proviso, three types of missing data have become apparent through recent studies: those relating to changes in practices, to social relations and to extra-familial activities. These absences further highlight the limitations of existing data.

Changes in practices

The expansion of TV channels through cable TV, videotex services and the appearance of other equipment which can be connected to TV's such as VCR's and home computers is already prompting discussion within the broadcasting authority research departments concerning how to monitor these new media developments (34). There is a general interest in how these media interrelate. So far the focus has been on the displacement of some media by others. Surveys have occasionally asked hypothetical questions about the activities in which respondents would be engaged if some current media facilities such as TV were not available. And time budgets have registered actual changes in activity - although these studies have, until recently, only operated with somewhat gross categories.

Now the TV companies have started to examine media use by employing more detailed categories - for example, evaluating shifts from live TV viewing to time-shifted viewing via the use of the VCR. Nevertheless, these researchers admit that the process is still crude, and does not yet cover the changing relations between media, such as their complementary use. Of course, this issue of the relation between activities is broader than just media use. There is a more general question of how a new technology or service has a bearing on practices and relates to changing patterns of social relations.

One manifestation of this issue occurs in the time budget research such as that of Gershuny and Jones (1987) which examines the relationship between the introduction of 'labour-saving' household technologies and changing domestic labour patterns. Certainly, there has been some speculation about the effects of new technologies on gender relations. Whereas some observers foresee a potentially more equitable roles for partners, others anticipate new consumption work for women.

While such changes are to an extent examinable though current time use statistics, many other potential predictions appear to be untestable at the moment because of the lack of detail in this time budget data. For example, we might want to ask whether word-processing in the home is starting to replace writing and typing for some social groups. Yet at the moment, since 'writing' is not usually a time budget category there would be no baseline for future comparisons. As cheaper home software becomes available, we might one day want to ask whether some social groups move to utilising their micros to create new records concerning home organisation or to set up new calculations which they did not do previously. Alternatively, one possible line of enquiry is to ask whether there are changes in the personnel who does such 'work' within the household. At this moment in time, researchers would have to rely on respondents' memory. In general, some of the changes which are encompassed in visions of the future remain untestable because our current measures are not geared to this level of detail.

Social relations

Current consumer research tends to focus on (a) the isolated activities of immediate users, and (b) the narrowly defined functional uses to which artefacts are put. In the case of micros, researchers usually ask who is using the machine (implicitly assuming that people use micros individually and not in pairs or groups) and they ask about that use in terms of the software which is being run. However, researchers do not generally ask whether people are 'using' the computer to entertain visitors, whether respondents conceptualise 'use' as relaxation.

Nor do analysts enquire whether a parent is 'using' the machine to keep children occupied in an area of the home where they can be monitored, or whether the micro ever provides a chance for parents and children to co-operate over a task, as the glossy ads would have us believe. In other words, quantitative data does not at the moment employ a wider sense of 'using' a computer, nor does it look at the role which artefacts play as part of the relationships between people. In fact, in the case of micro, this very stress on individualised data reinforces the image of users as being isolated with their machines.

Admittedly, it is not easy to quantify some of the uses described above. More judgement is required when employing such classifications of 'use' than when simply categorising the software which is being run. Nonetheless, it is this form of analysis which can supply a more enriched picture of use and, indeed, help us discern the influence of new technologies. If the micro is used to entertain others, then the appropriate activity which may be displaced is showing visitors the book or music collection, or playing cards. If the home computer's role is 'keeping the children quite', then it can be an alternative to comics. If the machine is meant to facilitate intra-familial co-operation, then maybe it is replacing other hobbies which used to perform this function. Thus, conceptualisation in terms of these uses changes some of the frameworks within which we evaluate the 'effects' of technology. Or, to alter the perspective somewhat, we can ask how new products are fitted into existing underlying practices and relations as well as asking about any changes which the new technology is supposed to be introducing.

Extra-familial activities

It was noted earlier that most of the attention of existing research on new domestic technologies is on usage solely in the home. Writers such as Golding and Murdock (1983) cite the rise in consumption of these domestic products and services is sometimes cited as evidence of a trend towards home-centred leisure. Yet, in the case of the home computer, we have already started to see how it is possible to ask about the role of this technology outside of the home, especially as an object of interest.

For example, it is possible to examine the role which knowledges about micros and about games play as a form of currency in the school - i.e. as an object of talk. Software is also exchanged and copied, as the Mass Communications study indicated. We can also pose

questions concerning the use of micros in other people's homes, (although this point has been touched upon occasionally by enquires relating to the use of computer outside of the home). Finally, quantitative analysis could examine the use of micros in other public sites: in shows, shops, and clubs.

This information may be amenable to quantification, but there has been little work on such extra-familial activities to date. In the case of micros, it has been left to more qualititative work and impressionistic accounts to show that on all these counts, boys are more involved with micros outside the home, whereas girls' usage remains based in the family (Haddon (1988)). This focus on the relations around new technology outside of the home cast new light upon the different gender experiences of the micro. Such a picture was not revealed by simply examining home-based usage and possession data. Arguably, it might be worth asking similar questions of other new ICTs.

B. **THE INTERPRETATION AND USE OF CONSUMPTION DATA**

One final avenue to explore is the very 'consumption' of these statistics. Little is known about the conditions under which various agencies seek our and utilise such material, including how, in practice, they interpret this information (35).

For example, how exactly do these data enter into academic knowledges of innovation and adoption processes? In other words, it is possible to treat academic labour processes themselves as the object of study. This might involve asking how researchers utilise such data when choosing samples on the basis of some theoretical representativeness. Or we might turn our attention to the pressures in academic work to cite 'hard' figures. The same type of questions could equally well be asked about the strategies by which market researchers utilise this data as evidence in market reports.

Alternatively, there is the issue of how ICT producers make use of these figures. What is the role of this source of information compared to others - such as the accumulated folklore of the industry, personal experience, theories of human motivation or more anecdotal evidence? And what are the pressures within different types of company to acquire such consumption data? Thus, one final recommendation for further research is to examine how much and in what ways this form of feedback about consumption shapes future design, production and marketing of new domestic technologies.

NOTES AND REFERENCES

1. For further details on the procedures used in the FES see **Kemsley, W. et al (1969), The Family Expenditure Survey Handbook**, HMSO, London.
2. For further details on the procedures used in the GHS see **Social Surveys Division (1973), The General Household Survey: Introductory Report**, HMSO, London.
3. Reported in Stossl, S.(1987), "Women as TV Audience: a Marketing Perspective", in Baehr, H. and Dyer, G. (eds.) Boxed In: Women and Television, Pandora Press, London.
4. For more details, see BBC Broadcasting Research **Department (1987), A Guide to BBC Broadcasting Research in the United Kingdom**.
5. Reported in the annual **Mediaworld Yearbook** from Media World, London.
6. Interview with market research firm.
7. A perspective on what research is made public for any specific product area can be gathered by comparing the proportion of research material in the London based Science Reference Library to the list of published reports contained in one of the directories of 'market research in print'.
8. **Screen Digest** (1986), "Video User Profiles: How the Market Shapes Up", January.
9. For example, one manufacturer supplied Screen Digest with its assessment of how many sales were for replacement purposes - a figure which is not widely available.
10. **Screen Digest** (1987), "British Consumer Media Spending", August.
11. There is some degree of standardisation. For example, in the case of blank audio cassette tapes, the BPI regards a 90 minute tape as being the standard unit, so that a 60 minute tape counts as two-thirds of a unit.
12. In recent years, the boundary between low cost business micros and up-market home computers has been blurring, especially with some models trying to appeal to both markets. In practice, most analysts either choose a somewhat arbitrary price point to mark the difference, or specify which models are going to count as 'business' or 'home', ignoring any sales which go to the other market.
13. **Key Note Publications (1987), Household Appliances (Brown Goods)**, London, p.14.
14. However, it was also pointed out that having a particular standpoint from experience in the industry was sometimes felt to affect judgements in a negative way.
15. This point does not simply reflect market research firms criticising their competitors. Even those analysts interviewed acknowledged that some of their own firm's research was not conducted with great rigour.
16. **Screen Digest** (1987), op.cit.
17. Interview with Screen Digest
18. Interview with Brema.
19. The examples of more and less co-operative sector were the pulp and welding industries respectively.
20. Interview with a market research firm.
21. **Screen Digest** (1987), op.cit.

22. This difference is partly produced because the cable firms try to present a more positive picture of their operation by listing new subscribers while not publicly mentioning the number of households which cease to subscribe.
23. The problem is that it is often not clear at what time of year the estimates are being made.
24. An example of was discussed in the home computer trade press, with a reply by Key Notes. This was reported in **Computer Trade Weekly** (1987), 24th August and 21st September.
25. **Screen Digest** (1987), op.cit.
26. Interview with a market research firm.
27. Interview with Screen Digest.
28. The re-reporting of market research can produce disagreement as well as consensus. Producers have access to privately commissioned research, which then informs the answer which they feed into published research. In some product areas, such as lawnmowers, the main producers never come close to agreeing because their private research sources provided them with very different pictures of the market.
29. Interview with a market research firm.
30. Interview with a market research firm.
31. A personal contact who had worked for a research company mentioned how he simply lifted plausible figures from the press in those product areas with which he was less familiar.
32. The Mintel survey (source BMRB/Mintel) had a sample size of 925 and fieldwork was conducted in December 1986. The M.R.G.B. survey (source RSGB/Euromonitor), had a sample size of 880 and was conducted in March 1986. Reference: **Mintel Market Intelligence**, March 1986, p.81; **Market Research Great Britain**, December 1986, p.22.
33. The Market Research source had a sample size of 1034 and fieldwork was conducted in March 1985. The Broadcasting Research source had a sample size of approximately 1000 and fieldwork was conducted throughout 1985. The Official Statistics source (Class figures were recalculated) had a sample size of 9993, and fieldwork was conducted throughout 1985. Further details have not been supplied for reasons of confidentiality.
34. Gunter, B. (forthcoming), "Media Expansion in the UK", **in Becker, L. and Schoenbach, K.(eds), Audience response to Media Diversification**.
35. This is one of the key themes of a current project at Sussex University being conducted by Cawson, Haddon and Miles: 'Delivering IT in the Home'.

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APPENDIX 1: ABBREVIATIONS OF ORGANISATIONS CITED IN THIS REPORT

Abbreviation - Name of organisation

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Trade Associations

Brema - British Radio and Electronic Equipment Manufacturers Association.
BVA - British Videogram Association
BPI - British Phonographic Industry.
Amdea - Association of Manufacturers of Domestic Electrical Appliances.

Publishing Market Research Companies

Key Note - Key Note Publications.
M.A. - Marketing Assessment
M.S.I. - Marketing Strategies for Industry.
M.R.G.B. - Market Research Great Britain (Owned by Euromonitor)
F.T - Financial Times
E.I.U. - Economics Intelligence Unit
Mintel - Mintel Publications
Henley - Henley Centre

Other Market Research Companies

AGB - Audits of Great Britain

APPENDIX 2: SOURCES AND DETAILS OF MARKET RESEARCH ON HOME COMPUTERS

Key: CJ = Carrick James Market Research, London.
GMS = Gowling Marketing Services, Liverpool.

Code:	Date	Title and Sample size
CJ (a):	Dec.81	'National Survey Among 5-24 Year Olds and Mothers of 2-12 Year Olds ', Base 1591.
CJ (b):	Apr.82	'National Survey Among 7-24 Year Olds and Mothers of 7-14 Year olds', Base 1354.
CJ (c):	Oct/Nov.82	'National Survey Among 7-19 Year Olds and Mothers of 3-6 Year Olds', Base 1426.
CJ (d):	Nov.82	'National Survey Among 11-24 Year Olds', Base 1030.
CJ (e):	Dec.82	'National Survey Among 7-17 Year Olds', Base 535 7-17 year old boys and 381 7-14 year old girls.
CJ (f):	Feb.83	'National Survey Among 7-14 Year Olds', Base 812.
CJ (g):	Feb/Mar.83	'National Survey', Base 897 7-14 year old males and 398 7-14 year old females.
CJ (h):	Jun.83	'National Survey Among 7-19 Year Olds', Base 1261.
CJ (i):	Aug.83	'National Survey Among 5-17 Year Olds', Base 1253.
CJ (j):	Sept.83	'National Survey Among 7-19 Year Olds', Base 1241.
CJ (k):	Dec.83	'National Survey Among 7-44 Year Olds', Base 2428.
GMS (a):	1983	'The UK Home Computer Market', Gowling, London. Base = 1994
GMS (b):	1985	'Microcomputer End-User Research', Gowling, London. Base = 2000