The Use of Precoded and Open-ended
Questions for the Collection of
Age and Income Information

A thesis presented in partial fulfilment of the
requirements for the degree of
Master of Business Studies
at Massey University

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1 INTRODUCTION

The objectives of this research were to determine the following points:

> 1) what effect the use of an open-ended format had on
>   the reply rates to age and income questions;
>
> 2) what effect the method of data collection has on
>   the reply rates to age and income questions;
>
> 3) whether any difference that occurs due to the
>   interviewer and/or the contents of the survey;
>
> and 4) what factors about the interviewer and/or contents
>   of the survey that may be causing this difference.

The research was conducted in three stages.

The first stage was the estimating of reply rates for open-ended and precoded age and income questions. These reply rates were estimated using each of the different data collection methods. A split sample design was used for each survey. Eight surveys being conducted by Massey University's Market Research Centre and Marketing Department were used in this stage of the research. Half of each sample received precoded age and income questions; the other half had open-ended questions.

Details of each survey can be found in Appendix One.

The group intervals for the precoded questions were the same width for each questionnaire so that consistency between surveys could be

maintained.

The second stage was an investigation of the attitudes of professional interviewers towards the use of open-ended rather than pre-coded questions. Personal interviews were carried out with thirty interviewers employed by three leading research companies. The interviews were conducted by Miss J Bowbyes, a honours student in the Department of Marketing at Massey University. Details of her research can be found in Appendix Two.

The third stage was designed to examine the effect the experience of the interviewers has on the reply rates of open-ended demographic questions.

Ten interviewers conducted ten interviews each in clusters of five households. Five of the interviewers were experienced professional interviewers, while the other five were inexperienced interviewers who received a half day of training before interviewing commenced. Both groups of interviewers received similar briefings. Further detail of this research can be found in Appendix Three.

One important problem that is not investigated in this research is the accuracy of the response to age and income questions. It may be that respondents are more likely to be truthfull when asked for information with a precoded question than an open-ended one. An investigation of this possible problem should be the objective of future research.

2 BACKGROUND

Grouped or precoded data is collected by presenting the respondent with a number of preselected intervals. The respondent then indicates into which group his reply corresponds to. For example, age may be data may be collected by asking "Into which group does your age fall"

    16 - 30 years

    31 - 45 years

    46 years and over

Open-ended data is collected by asking for the respondent to provide an actual estimate of the variable in question. Using the age example once more, the question could now be phrased "In what year were you born?"

Before the introduction of online terminals for computers, the main data input device was the punch card and in conjunction with this the counter sorter, then the only method of conducting analysis of large amounts of data. For variables such as age and income it was necessary for the data to be put into groups so that the counter sorter could perform effective and efficient analysis on the data. Because of the limited abilities of the counter sorter, the only method of analysis between variables was cross tabulation. Thus grouped questions were used in preference to actual data questions simply because the machinery used for analysis did not require more detailed information.

However, with the advent of cheap disk storage and more advanced software these reasons for gathering grouped data disappeared. The cost of the various types of analysis, such as regression and factor analysis, decreased so much that the attractiveness of actual data increased. Besides this more precise data were often required for such methods of analysis. If required the data could be grouped later on. With the information being collected in a more precise format the researcher is not restricted to the groups set out in the questionnaire. In other words the groups could be changed whenever necessary.

However, the use of grouped data collection has tended to persist. Market researchers presented another reason for their continuance of this practice. In their opinion, grouped data questions gained a better response (ie., a lower question refusal rate) than did the actual data questions. They believed that people were sensitive about such subjects as age, income and the like and preferred the anonymity of grouped answers. Brown (1984) says precoded responses "leave the respondents more comfortable". Stockwell (1984) states "Our experience suggests that precoded groups do provide a better response rate. We generally obtain lower refusal rates for precoded groups rather than specific details...". BCNZ collect its age data in five yearly intervals. Battell (BCNZ 1984) states "our interviewers tell me that they have few problems with this. Furthermore, they inform me that they consider asking people's exact age would also cause few problems although interviewers feel more comfortable with precoded groups." Unfortunately there does not appear to be any research that will support or refute any of these views.

3 LITERATURE REVIEW

There does not appear to have been any research or literature published on the use of open-ended versus pre-coded age and income questions. Research has been conducted into related topics such as open-ended versus closed questions (Dohrenwend 1965, Metzner and Mann 1952, Payne 1965) - though this was concerned about attitude questions not demographics - recording and response errors (Borus 1966, 1970, Le Roux 1968), and information classification (Belson 1963, Cauter 1956).

Although there is no literature on this specific topic some researchers have made some comment on the use of pre-coded groups and data precision. Cauter (1956) stated "Whereas quota controls may be specified in age groups such as 18-30, 31-45, 46 and over, there is no reason at all why age, if regarded as an important analytical variable, should be confined to these three groups provided the actual age of respondents is collected during the course of the interview." He went on to conclude, "Thus the principle of precision in the collection of classification data means simply that it is desirable to collect this data in as much detail as possible and to avoid confusing the needs of analysis data and the needs of validation data."

Withey (1954) also touched upon the subject of precision. He stated, "The determination of individual income level in a survey is a fairly simple matter if one's purpose is only to categorise respondents into broad classifications each covering a range of say two thousand

dollars. If one desires to be fairly precise, however, the task becomes complex. Most people regard their income as an exceedingly personal affair and problems arise in maintaining interview rapport." This last sentence is most interesting. It supports the view of commercial researchers here in New Zealand (see above). Unfortunately, Withey did not present any evidence which would support this statement.

Borus (1970) examined two different approaches for requesting information on earnings. The two approaches were, firstly, asking a question such as, "Last year, how much did you receive in wages or salary before deductions?". The second approach was to "ask many questions about each job held by the respondent to secure a detailed work history." This research, as well as other studies, examined question wording for demographic information but ignored the question of whether to ask for grouped or actual information.

In a piece of unpublished research the Massey University Market Research Centre (1984) found that pre-coded questions obtained higher reply rates for age and income questions than did open-ended questions. However, there were a number of problems with the survey that may have caused the estimates to be inaccurate. One of these was that the two versions of the questionnaire were not correctly distributed amongst sample members. Each alternate member of the sample should have received the same version of the questionnaire. Unfortunately this did not occur. In many cases each member of a cluster received the same version. This in itself may have caused bias to enter the estimates of the effect of asking for open-ended information.

Another problem was that the reply rates obtained are very low, this can be seen in the table below.

	Reply Rates for Massey University MRC, 1984		
	Age	Personal Income	Household Income
	(%)	(%)	(%)
Precoded	99	64	58
Open-ended	95	54	48

Research companies have indicated that they usually obtain reply rates of over 90 percent for the household income question. The reply rates obtained for both versions of this question are well below this benchmark. This suggests that the results obtained here are not indicative of interview surveys in general. This in itself would not be a problem if it could be accurately determined that the differences obtained in the reply rates for the two treatments were constant no matter what the reply rate. Unfortunately it is not possible to determine this from the information provided.

Due to these and other problems, such as the lack of control over the research method by this researcher, this survey has not been included as an indicator of the effect of asking for open-ended inforation in this research.

4 SUMMARY

For face-to-face surveys the same percentage of respondents replied to the age question in both the precoded and open-ended forms. This was not so for income questions. When asking for personal income the use of the open-ended question does have a small effect. This effect is much larger when asking for the household income. However, the interviewers used to collect this information were untrained and inexperienced; which may have some effect on the number of replies.

The use of experienced interviewers has a positive effect on the reply rates for open-ended questions. Experienced professional interviewers obtained higher reply rates than did the inexperienced interviewers.

Experienced interviewers asking household income with an open-ended question obtained more responses than inexperienced interviewers using precoded questions.

A small survey of professional interviewers revealed very negative attitudes towards the collection of age and income with open-ended questions. Research suggests that these attitudes may become less hostile when the interviewer has received some formal training.

Due to problems with the interviewers in one survey and only age being asked for in the other, it is not possible to estimate accurately any difference in the reply rates between open-ended and precoded questions

in telephone surveys.

Open-ended questions obtained lower response and reply rates   than   did precoded questions for mail surveys.

5 REPLY RATES BY DATA COLLECTION METHOD

5.1 FACE-TO-FACE SURVEYS

5.1.1 Age

In face-to-face interviews the form of the question has virtually no effect when asking for age. Approximately 98 percent of the respondents replied to both versions of the question. It was not expected that the reply rates for the two questions would be so similar. The is an important result as researchers have believed for quite a long time that the the effect of open-ended version would be a lower reply rate. This does not appear to be the case for age questions in face-to-face interviews.

5.1.2 Personal Income

There was a difference in the reply rates of the two treatments for the personal income question. Approximately 94 percent of respondents who were asked the precoded question replied, compared with around 88 percent of the respondents asked the open-ended question. While the difference is not large it is in the expected direction. The standard error of the difference is 3.26 percent. This is significant at the 95 percent level

(p=0.0266).

5.1.3 Household Income

The difference between the two treatments in the household
income question was quite large. Approximately 87 percent of
the respondents who were asked the precoded question replied.
This was ten percent higher than the number of respondents who
replied to the open-ended question. The difference here once
again is in the direction that research companies had expected.
A difference of ten percent (although it was as low as five
percent for one survey) in the reply rates is quite important to
research companies, who when trying to make sure that the sample
is representative of the population want as much demographic
information about the respondents as possible.

The standard error of the difference is 4.45 percent (p=0.0123).
This means that the difference is very unlikely to be due to
chance in sampling. Consequently the question format does
appear to affect the reply rate.

However, it must be borne in mind that the interviewers used
were untrained students. There is evidence which suggests that
experienced interviewers obtain a far higher reply rate for
open-ended questions, see section 6.2.3.

5.2 TELEPHONE SURVEYS

Two telephone surveys were included in the research. One of the surveys asked only for age, while the other asked for age and income information.

The first survey, that which asked for age only, had very good reply rates for both the precoded and open-ended questions. All of the respondents who were asked the precoded version replied, while 97 percent of those asked the open-ended version replied. These reply rates are much the same as those obtained in the face-to-face surveys.

The second survey had very low reply rates for both precoded and open-ended versions in all of the demographic questions. The reply rates obtained for each of the questions are outlined below.

Reply Rates for Manawatu
Museum Telephone Survey

	n	Age (%)	Personal Income (%)	Household Income (%)
Precoded	75	97.3	72.0	62.7
Open-ended	79	89.9	69.6	41.8

It was suspected that the low reply rates were due to the ineptitude of the particular student interviewers used. To check this the

open-ended version of the questionnaire was repeated to twenty people randomly selected from the Manawatu Telephone Directory. The interviewing was conducted by the author of this research. Reply rates of 80 percent were achieved for the age and two income income questions. This indicates that the reason for the poor reply rates was something to do with the interviewers. This could be due to their lack of training or just poor interviewing technique.

Reply rates for income questions in telephone surveys are usually between 90 and 93 percent (personal communication, Ms W Stockwell, MRNZ Ltd.). Quite obviously the reply rates obtained for both the precoded and open-ended questions are much lower than expectations. Since the reply rates are not typical of telephone surveys in general the differences obtained between the two treatments cannot be used as a measure of the effect that asking open-ended questions has on the reply rate.

With the removal of this survey from the analysis only the first survey mentioned here remains. Unfortunately income information was not asked for in this survey. Thus more research needs to be conducted using this data collection method, to investigate differences, if any in the reply rates of the two treatments.

5.3 SELF COMPLETION SURVEYS

This section includes two different types of surveys. They are mail surveys and a "drop-off" survey where the questionnaires were left in a museum for the visitors to complete as they wished. There was only one survey used in each of these categories.

For the mail survey the pre-coded version of the questionnaire had a response rate of 75 percent, and the open-ended version was 67 percent. This difference is quite substantial and is also statistically significant (p=0.038) confirming the view of research companies that open-ended questions have a negative effect on the response rate of questionnaires.

The standard error of the difference is 4.27 percent.

The table below presents the reply rates obtained for each of the questions in the mail survey.

Note that the respondent was asked to provide the head of household's income, which was not necessarily their own. They were not asked whether or not they were the head of household.

Reply Rates for the
Macadamia Nut Mail Survey

	n	Age	Head of Household's Income
		(%)	(%)
Pre-coded	168	98.2	90.5
Open-ended	151	94.7	80.1
Standard error of the difference		2.09	3.96

It is interesting to note that there is a difference in the reply rates for the age question. No such difference had been found for the face-to-face surveys. The difference also happens to be statistically significant at the 95 percent level (p=0.047).

The difference in the reply rates for the head of household's income was also quite large at over ten percent. This is statistically significant at the 99 percent level (p=0.0043).

In the Manawatu Museum drop-off survey the use of the open-ended version did not affect the reply rate for the age question. All of the respondents replied to the pre-coded version, while only one refused to answer the open-ended version.

The open-ended version of the questionnaire did however, make a difference to the reply rate for the personal income question. The pre-coded version obtained a reply rate of 81 percent, compared to 64 percent for the open-ended version. The difference of 17 percent is

far larger than that obtained for the face-to-face surveys. The standard error of the difference is 6.64 percent. This means that the difference is statistically significant (p=0.54 percent).

The household income question was not asked in this survey.

6 FACTORS AFFECTING FACE-TO-FACE REPLY RATES

Due to the small number of surveys and the lack of information in both the telephone and self-completion data collection methods this section will concentrate on factors which may influence the reply rates for face-to-face surveys.

Two reasons suggest themselves as to reasons why a respondent might not divulge income information. The first is that he or she is unwilling to provide the information for some reason. For example, the respondent may regard the information as confidential. When an interviewer is interviewing a respondent who firmly believes this then there is only a very small chance that the respondent will be persuaded to provide the information. If the respondent regards this information as confidential it may be that the form of the question does not matter.

The second possible reason is that the respondent does not know what the answer is and therefore cannot answer the question. Asking for income with an open-ended question may cause the respondent to believe that you are asking for the information to the nearest dollar. Probably only a few people could state their income to this figure. Thus it is important that when asking for income with an open-ended question that the respondent knows that only an approximation to the nearest five hundred or even thousand dollars is required. This is especially important when asking for the household's income. With many

households having multiple incomes the chances of the respondent knowing the exact amount is small. Thus the precoded question works in favour of the interviewer. The respondent may not know the household's exact income but can provide an excellent guess as to which five thousand dollar interval is appropriate.

This does not mean that respondents should not be asked for the actual amount. A correctly trained interviewer will recognise the hesitation and ask for an approximation instead. It is most important that when asking for this information that the interviewer stresses that an approximation will suffice.

The student interviewers used in these face-to-face surveys had not been trained to probe in this way for income information when presented with a non-reply. Consequently it is not possible to determine whether the non-reply was due to a refusal to supply the information or through a lack of knowledge. It may well be that the results of the personal income question are more indicative of what occurs when asking for income with open-ended questions than the results to the household income question.

6.1 Effect of the Questionnaire Content

The effect of the questionnaire content was tested on four surveys. The effect of asking for open-ended income is shown in the table below.

The Effect of Asking for Open-ended Income on the Question's Reply Rate by Survey

Survey	Precoded Reply Rate	Open-ended Reply Rate	Difference in Reply Rates by	
			Percent	Number of Non-replies
	%	%	%	n*
Standard	90	84	-6	-4
Juster	93	89	-4	-2
Centrepoint	100	96	-4	-1
Goat	100	87	-13	-3
Overall Average	94	88	-6	-10

* This figure is calculated by subtracting the number of non-replies to the open-ended version of the questionnaire from the number of non-replies to the precoded version.

It is interesting to note that the reply rates for the precoded treatment are all 90 percent or above. Of the reply rates for the open-ended questions only one had a rate above this point.

Note the 13 percent difference in reply rates for the Goat survey. This was due more to the small sample size (a difference of only

three respondents in non-replies) than any significant finding.

Some of the variation in the differences of the reply rates may be due to the questionnaire content while some may be due to the interviewer. To provide an accurate estimate of the effect that the survey has on the reply rate the effect of the interviewer needs to be removed. This can be done by using a hierarchial analysis of variance (see Appendix Seven for details). The result of this analysis shows that the survey accounts for approximately two percent of the variance. This means that the survey is only having a very minor effect on the variation in the reply rates. The variance ratio of 1.031 is not statistically significant.

6.2 Effect of the Interviewer

The differences in reply rates for the individual interviewers were larger than they were for the surveys, although, the differences in number of cases were often small. This can be seen in the table below.

With the removal of the effect of the survey the interviewer is left to account for approximately six percent of the variation in the reply rates. This is approximately three times that of the variance due to the survey.

Other research (Belson 1967, Mckenzie 1973, Schyberger 1967) shows that the interviewer can be a major source of bias in a survey. The

variance ratio is 1.989, which is significant at the 95 percent level.

The Effect of Asking for Open-ended Personal
Income on the Question's Reply Rate by
Interviewer

Inter-viewer	Precoded Reply Rate	Open-ended Reply Rate	Difference in Reply Rates by	
			Percent	Number of Non-replies
	%	%	%	n*
One	100	100	0	0
Two	100	89	-11	-1
Three	100	100	0	0
Four	95	96	+1	0
Five	90	80	-10	-2
Six	100	87	-13	-2
Seven	92	69	-23	-3
Eight	100	100	0	0
Nine	71	79	+8	+1
Ten	100	83	-17	-1
Eleven	100	80	-20	-1
Twelve	100	100	0	0
Thirteen	100	87	-13	-1
Overall Average	94	88	-6	-10

* This figure is calculated by subtracting the number of non-replies to the open-ended version of the questionnaire from the number of non-replies to the precoded version.

This means that the interviewer is having some effect on the reply rates obtained. The interviewer, however, has any number of characteristics which may be causing this effect. Some of these are physical aspects such as the sex and race of the interviewer. Others are more company specific such as the training and experience that the interviewer has received. Others again are more intangible such as the attitudes of the interviewer towards the collection of open-ended information.

6.2.1 Race and Sex of Interviewer

Research companies traditionally favour females and caucasians for interviewing positions. There are a number of reasons for this preference. One of them is that these people are perceived to be less threatening when asking for personal information. Indeed some quite striking differences in reply rates were obtained between male and female, caucasian and non-caucasian interviewers in surveys used in this research. Further information can be found in Appendix Six.

However, the accuracy of the estimates of these differences are open to question. It must be remembered that the interviewers used are untrained, inexperienced interviewers. If the interviewers had been trained then it is quite possible that the differences would not have occurred. For further information on the effect of the experience of interviewers see section 6.2.4.

6.2.2 Interviewer Attitude

Of the thirty professional interviewers (for details of the research method see Appendix Two) approached only two showed any degree of willingness to ask for income in an open-ended form.

The response to the attitude questions on the asking of age with open-ended questions was better although still discouraging. Ten of the interviewers showed some willingness to collect this information. The remainder were still hostile but not to the degree that they were for the collection of income with open-ended questions. Detailed results of this research can be found in Appendix Five.

It was planned that the interviewers with the least and most hostile attitudes should be engaged to conduct a commercial research project. The questionnaire would have included open-ended age and income questions. The reply rates for the two groups of interviewers would have then been compared to determine the effect of their attitudes on the reply rates.

Unfortunately these interviewers were not available at the appropriate time. Consequently this research had to be cancelled. This research method should be repeated in the near future to provide an estimate of the effect of the interviewer's attitudes on the reply rate. If they do have some effect then steps can taken to overcome them.

6.2.3 Interviewer Training

Examination of the relationship between the training of interviewers and their attitudes towards the collection of age and income with open-ended questions suggests that trained interviewers may be less hostile than untrained interviewers.

Hostility was determined by the respondents answers to a number of attitude questions towards the collection of data with open-ended questions.

Relationship Between Training and Attitudes
of Professional Interviewers Towards the
Collection of Open-ended Age and Income

Median Attitude Score	Amount of Training			Total
	None	Regular Briefing Only	Formal Training	
	(n)	(n)	(n)	(n)
Very Hostile	0	3	2	5
Hostile	8	8	1	17
Neutral	1	4	3	8
Total	9	15	6	30

Of the nine interviewers who had nor received any training, eight or 89 percent, were quite hostile. This compares with 73 percent of those who received regular briefings and only 50 percent for those interviewers who had received some formal training. This evidence, though, is not conclusive due to the

small size of the sample.

An interesting feature of this table is that it suggests that there is a definite lack of training by research companies. Of the thirty interviewers only one in five had received any formal training ranging from half to two days. Approximately a third of the interviewers did not even receive regular briefing, written or oral, before a survey. This sample may not be representative of all professional interviewers in New Zealand, since only three of the eight companies approached agreed to have their interviewers interviewed. The original purpose of this research was to investigate the effect that these attitudes had on the reply rate to open-ended questions, not to look for a relationship between the interviewer's training and their attitudes. A report on the available evidence as to interviewer training in New Zealand is currently in preparation (Bowbyes 1984).

One theory that has been proposed (Ito 1963) that the level of education of an interviewer can negate the effect of training. He concluded that "training makes little difference to performance of interviewers with a college education since these people may already do relatively well, while it has a great effect upon performance of interviewers with a high school education since these people do badly without training".

Unfortunately it is not possible to test this theory on the information that is available. The reason for this is that it

is not possible to differentiate between the effect of experience and the effect of training.

6.2.4 Interviewer Experience

The interviewers used in the original data collection stage of this research were all untrained, inexperienced students, who were engaged in the interviewing as part of their course work. Consequently, the reply rates obtained were expected to be lower than those which professionally trained experienced interviewers would obtain. Collins (1976) in a study conducted under the auspices of Social Community and Planning Research (SCPR) was unable to distinguish between the replies to questions obtained by experienced interviewers and those obtained by inexperienced interviewers. Differences in responses were looked for in a number of questions where respondents were asked to state their attitude towards a statement. Collins found that the number of "strongly agree" and "strongly disagree" answers for the two groups of interviewers were very similar. While some of the interviewers used in this survey were inexperienced they had been thoroughly trained. SCPR are known for the very high level of training that they give their interviewers.

In a review of published research (Collins 1980) he reported that "lack of experience can be overcome by training, supervision and other disciplines applied by a practised research team".

Schyber (1967) supported Collins' evidence. He also found only very small differences in response rates between the two sets of interviewers, although experienced interviewers deviated less often from the questionnaire than did inexperienced interviewers. The inexperienced interviewers used in this research were given the normal training of the Swedish research institute that hired the interviewers.

As part of this research it was decided to test the effect the experience of the interviewer has on the reply rates obtained when collecting age and income information in an open-ended format.

Ten interviewers were hired to undertake a commercial survey where age and income were to be collected with open-ended questions. Five of the interviewers were experienced professional interviewers hired through a leading market research firm. The other five were selected from a number of respondents to a newspaper advertisement. These five were untrained and inexperienced in interviewing.

The five inexperienced interviewers were given a four hour combined training and briefing session. They were briefly taught how to interview correctly and how to request information with open-ended questions. A number of trials were conducted with the questionnaire that was to be used. These trials were video taped and then played back to demonstrate mistakes that had been made.

The five experienced interviewers received a two hour personal briefing. In this briefing interviewers were shown how to cope with the asking of age and income using open-ended questions.

The briefings and training session were run by an experienced market researcher.

The reply rates obtained by the three groups of interviewers can be seen in the following table.

Reply Rates of Open-ended Questions
by the Interviewer Used

	Number of Interviews	Reply Rate Obtained for		
		Age	Personal Income	Household Income
	(n)	(%)	(%)	(%)
Experienced Professional	50	100	96	90
Inexperienced Professional	50	96	92	74
Inexperienced Student	151	98	88	77

The experienced interviewers had higher reply rates for all of the questions. This was especially so for the household income question. Note that the two groups of inexperienced interviewers had very similar reply rates for all of the questions.

The table below combines the data for the two groups of

inexperienced interviewers and compares them with the reply rates of he experienced interviewers. The inexperienced interviewers reply rates have been calculated by taking a weighted average of the inexperienced professional and student interviewers.

Reply Rates of Open-ended Questions
for Experienced and Inexperienced
Interviewers

	Number of Interviews	Reply Rate Obtained for		
		Age	Personal Income	Household Income
	(n)	(%)	(%)	(%)
Experienced	50	100.0	96.0	90.0
Inexperienced	201	97.5	90.0	76.3
Standard error of the difference		2.5	3.5	5.2

The differences in reply rates between the experienced and inexperienced interviewers are large for both the personal and household income questions. This is especially so for the household income question. Not only are these differences large they are also statistically significant. This difference suggests that experienced interviewers will obtain better reply rates for open-ended age and income questions than will inexperienced interviewers.

It is interesting to note the high reply rates obtained by the experienced interviewers, especially for the age and personal income questions. Although the sample size was quite small the

reply rates are a useful indicator of the effect of asking for this information with open-ended questions. Experienced commercial researchers indicate that their usual reply rates for household income in a precoded format is between 90 and 95 percent (personal communication). Some reports of research companies appear to suggest that none of their respondents do not know or refuse to supply their age, income and household income.

The reply rate for the household income question for the experienced interviewers just falls into the bottom of this scale.

APPENDICES

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APPENDIX ONE

Stage One Survey Methods

Goat Products Survey

The objective of this survey was to examine consumers' attitudes towards two specific goat products and then other goat products in general.

The research was conducted on behalf of local goat farmers by third year Market Research students from Massey University's Marketing Department during June 1984. The research was supervised by Mr D Esslemont.

The sample consisted of 50 households. Ten starting points in Palmerston North City were selected from the Manawatu Telephone Directory. From this house every alternate household was selected until five households had been chosen. Up to three call backs were made at varying times of the day over a period of four days.

The chief grocery shopper in each household was interviewed.

Each household had a pot of gouda and fetta cheese left with it. A week after the placement interviewers returned to each household where a placement had occurred.

There were no refusals of interviews from those approached.

Manawatu Museum

This research was conducted by final year Marketing students at Massey University under the guidance of Messers D Esslemont and R Mayo for the Manawatu Museum in 1984.

The objectives of this research were to examine the populations' attitudes towards the Museum and ways in which the Museum could be improved. Two questionnaires were designed to fulfill these objectives.

The first was a survey of users of the Museum. 300 questionnaires were left at the museum where staff attempted to ensure that every visitor over the age of fifteen completed a copy. The questionnaires were left there for a period of three weeks - May 15 through June 7.

178 of the questionnaires were completed.

Due to an error on the questionnaire respondents only replied to the personal income question for the questionnaires with the grouped question treatment. Because of this error only the personal income question was subsequently analysed.

The second survey consisted of a telephone interview to 200 households selected from the Manawatu Telephone Directory. The sample was

randomly drawn.

The person who was interviewed in the household was that person aged fifteen years or more whose birthday fell next.

The interviews were conducted in the evening during the second week of June. Three recalls were made to a household, at different times, before it was classified as a non response and another household was selected.

A response rate of 78 per cent was obtained.

Centrepoint Survey

This research was conducted by third year Marketing students at Massey University for Palmerston North's Centrepoint Theatre. It was supervised by Messers D Esslemont and P Lambourne.

The objectives of the research were to test the effectiveness of various membership packages at first, attracting new members and second, gaining more participation from existing members.

Two samples were drawn. The first consisted of 50 non-members. Ten starting points in Palmerston North City were selected from the Manawatu Telephone Directory. From the starting point ev ry alternate household on that side of the street was selected until five households had been selected. No call backs were made. A 60 per cent response

rate was obtained.

The second sample consisted of 30 members. These were selected from the current membership list using an equal interval method.

Three call backs were made to the sample members before they were declared as nonrespondents and another member was selected. A response rate of 90 per cent response rate was obtained.

Only 50 of the 80 respondents replies were used in the analysis for this research as two of the interviewers did not follow instructions. Instead of asking alternate households for actual information they asked all households for grouped data.

Manawatu Evening Standard Survey

This research was commissioned by the Manawatu Evening Standard with the objectives of determining readership levels for each of the editorial sections of the newspaper and the attitudes of readers to these sections. The research was conducted by third year Marketing students at Massey University. It was supervised by Messers D Esslemont and S Wright.

The sample consisted of 80 households selected from the Evening Standard's circulation area. The sample was proportionately stratified by region. The regions included Palmerston North city, Feilding, Ashhurst, Rongotea, Bulls, Foxton and Linton.

The number of households surveyed in each strata was determined by the region's proportion of total circulation.

Palmerston North City

A starting point was selected from the Manawatu Telephone Directory for each subdivision. From this starting point each alternate household was interviewed. Each cluster consisted of five households.

Feilding and Inner Districts

The households in Feilding and the inner districts were randomly chosen from the telephone directory. The house to the right of the selected dwelling was then included in the sample.

Outer Districts

To minimise interviewing costs, Bulls and Foxton were chosen to represent the outer districts. From the "districts" listings in the Manawatu telephone directory five households were randomly selected for each area. Once again the house to the right of the selected household was included in the sample.

From each household (where both sexes were present) a male and a female was interviewed. They were required to be over the age of ten years and to have the next birthday out of the eligible members of the household. Three call backs were made before a household or an

individual was classified as a non-response. The interviews were spread as evenly as possible over a two week period from the 14th to the 26th of May, 1984.

The response rate was 75 percent.

Juster Scale Survey

The research was commissioned by the Market Research Centre of Massey University to examine whether the Juster Scale was a better predictor of purchasing behaviour than the more conventional five point scale. The method was designed by a graduate student of the Faculty of Business Studies under the supervision of Mr D Esslemont.

Starting points were selected from the Manawatu Telephone Directory. Every second household was then selected from the starting point until ten households had been visited. One callback was made to a household before it was declared as a non respondent.

A response rate of 70 per cent was obtained.

Macadamia Nut Survey

This project was commissioned by the Macadamia Nut Growers Cooperative through the Market Research Centre at Massey University. The research was designed and conducted by Mr D McMillan, a graduate student in the

Business Studies Faculty. Mrs S West supervised the research.

A mail survey with a sample size of 500 was used to gather the information. The sample was drawn from the Auckland Telephone Directory using an equal proportion sampling method to select the page number. A column was then chosen by the use of random numbers. From this the household was selected by taking the address of the household at a certain distance down the column.

Three reminder letters were sent to non-respondents.

In addition to the alterations of the wording of the age and income questions two other methodological techniques were being tested. These were hand-written versus computer printed labels for the addresses and personally signed versus printed signatures for the covering letters. The three different variables being tested resulted in a two by two by two factorial design. Special care was made to ensure that non respondents when being sent reminder letters received the same treatments each time.

The response rate was 71 percent.

Grocery Store Survey

This research was conducted by the Massey University Market Research Centre for a Palmerston North grocery store.

Telephone numbers were randomly selected from the Manawatu Telephone Directory. Telephone numbers which were not in Palmerston North were ignored. The person interviewed in each household was the person who did the most grocery shopping.

A total of 263 households were contacted. Of these there were 18 non-responses and 36 refusals. This gave a 92 percent response rate.

APPENDIX TWO

Interviewer's Attitude Survey Method

The objective of this research was to investigate the attitudes that professional interviewers had towards the collecting of age and income information with open-ended questions. The research was supervised by Mr D Esslemont of the Marketing Department at Massey University.

Eight research companies were approached, though only three agreed to have their interviewers interviewed. These three companies provided lists of their interviewers who were then interviewed by a graduate student of the Marketing Department at Massey University. All of the interviewers were selected from those living in the Wellington region.

Both face-to-face and telephone interviewers were selected. In total thirty interviewers were interviewed.

APPENDIX THREE

Interviewer Experience Survey Method

The objective of this research was to see if the experience of the interviewer had any effect on the reply rates to open-ended age and income questions in a commercial survey.

Five inexperienced untrained prospective interviewers were hired in Palmerston North City. These five interviewers received a half day of training to familiarise them with interviewing techniques. Mock interviews were conducted to test their skills. These were video taped for later playback to demonstrate any mistakes that occurred.

Five experienced professional interviewers were hired from a leading Market Research company. These interviewers all resided in the Wellington region.

The survey used was part of a commercial project being conducted for a bread manufacturer who wished to test the viability of some new loaf concepts.

Twenty clusters, ten each in Wellington and Palmerston North, of five households were used. The starting points were selected from the respective telephone directories of each city. The person interviewed in each household was the person described as the chief grocery

shopper, commonly known as the `housewife'.

The response rate was 60 percent.

APPENDIX FOUR

Stage One Age and Income Reply Rates

FACE-TO-FACE INTERVIEWS

The differences in reply rates obtained overall for face-to-face surveys was not uniform between each survey used. The effect of the interviewer was greater in some than in others. Details of the reply rates for each survey is outlined below.

Centrepoint

Question Reply Rates for
the Centrepoint Questionnaire

	n	Age %	Personal Income %	Household Income %
Pre-coded	25	96	100	96
Open-ended	25	100	96	88
Standard error of the difference		3.90	3.90	7.58

The refusals obtained in the household income question were shared evenly by the interviewers.

Evening Standard

Question Reply Rates for the
Evening Standard Questionnaire

	n	Age %	Personal Income %	Household Income %
Pre-coded	50	96.0	90.0	74.0
Open-ended	56	96.4	83.9	69.6
Standard error of the difference		3.73	6.50	8.73

The variation between the two reply rates was not great, with only the personal income question difference being reasonably large. There was however, a large difference in the reply rates obtained by the individual interviewers. One interviewer obtained very low reply rates in comparison with the others. For example, his reply rate for the open-ended version of the household income question was only 54 percent. This compares with a reply rate of 94 percent for the best interviewer. The interviewer who obtained this high reply rate managed to obtain the highest reply rate for all of the questions and their treatments for this survey.

Juster Scale

Question Reply Rates for the
Juster Scale Questionnaire

	n	Age %	Personal Income %	Household Income %
Pre-coded	42	100.0	92.9	88.1
Open-ended	47	97.9	89.4	74.5
Standard error of the difference		n/a	5.99	8.09

With the exception of the household income question the differences in reply rates for the two treatments were small. However, this was not so for the differences between the two interviewers used. This researcher, who was one of the interviewers, consistently obtained higher reply rates. The difference was particularly noticeable for the open-ended versions of the personal and household income questions. Reply rates of 96 and 78 percent were obtained for these two questions by this interviewer. This compares with reply rates of 80 and 70 percent for these same two questions by the other interviewer used.

Goat Farmers

Question Reply Rates for the
Goat Farmers Questionnaire

	n	Age %	Personal Income %	Household Income %
Pre-coded	27	100	100	100
Open-ended	23	100	87	87
Standard error of the difference		n/a	7.0	7.0

The refusals for the income questions were shared roughly evenly between the four interviewers used.

TELEPHONE INTERVIEWS

Manawatu Museum

Question Reply Rates for the
Manawatu Museum Telephone
Questionnaire

	n	Age %	Personal Income %	Household Income %
Pre-coded	75	97.3	2.0	62.7
Open-ended	79	89.9	69.6	41.8
Standard error of the difference		3.87	7.32	7.87

The differences in reply rates between the interviewers for the income questions were quite large. For example, one interviewer had a reply rate of 27 percent for the open-ended version of the household income question! The best interviewer had a 67 percent reply rate for the same version of that question. Similar variations between interviewers occurred for the personal income question.

These differences between interviewers were not only limited to the open-ended version of the questions. Reply rates for the pre-coded version of the personal income question ranged from 36 to 92 percent between interviewers.

The reply rates for the pre-coded version of the income questions were far lower than is normal for a telephone survey. For this reason the results found in this survey were not included in the analysis for this

report.

Grocery Store

Question Reply Rates for the Grocery Store Questionnaire

	n	Age
		%
Pre-coded	104	100
Open-ended	105	97

The non-replies for this survey were all obtained by the same interviewer.

SELF COMPLETION SURVEYS

Macadamia Nut Survey

Question Reply Rates for the
Macadamia Nut Mail Survey
Questionnaire

	n	Age %	Head of Household's Income %
Pre-coded	168	98.2	90.5
Open-ended	151	94.7	80.1
Standard error of the difference		2.09	3.96

Manawatu Museum Survey

Question Reply Rates for the
Manawatu Museum Survey
Questionnaire

	n	Age %	Personal Income %
Pre-coded	93	100.0	80.6
Open-ended	85	98.8	63.5
Standard error of the difference		n/a	6.64

APPENDIX FIVE

Attitudes of Professional Interviewers Towards
the Collection of Open-ended Age and Income

I think that most people would not mind giving their
exact income in a survey.

	(n)	(%)
Strongly Agree	1	3.3
Agree	1	3.3
Neutral	5	16.7
Disagree	13	43.3
Strongly Disagree	10	33.3
	------	------
Total	30	100.0

Asking someone for his or her actual income makes me feel awkward.

	(n)	(%)
Strongly Agree	14	46.7
Agree	13	43.3
Neutral	1	3.3
Disagree	1	3.3
Strongly Disagree	1	3.3
	------	------
Total	30	100.0

Asking someone to mark their income on a grouped scale
is less embarrasing for me than to ask for their actual income.

	(n)	(%)
Strongly Agree	9	30.0
Agree	18	60.0
Neutral	3	10.0
Total	30	100.0

I think that most people would not mind giving their
exact age in a survey.

	(n)	(%)
Agree	14	46.7
Neutral	5	16.7
Disagree	8	26.7
Strongly Disagree	3	10.0
Total	30	100.0

Asking someone for his or her actual age makes me feel awkward.

	(n)	(%)
Strongly Agree	3	10.0
Agree	11	36.7
Neutral	6	20.0
Disagree	10	33.3
Total	30	100.0

Asking someone to mark their age on a grouped scale
is less embarrasing for me than to ask for their actual age.

		(n)	(%)
Strongly Agree		6	20.0
Agree		15	50.0
Neutral		6	20.0
Disagree		3	10.0
		------	------
	Total	30	100.0

APPENDIX SIX

Reply Rates by Sex and Race of Interviewer

Sex

Reply rates for male and female interviewers used in initial data collection.

	n	Age	Personal Income	Household Income
		(%)	(%)	(%)
Male -				
pre-coded	97	97.9	91.8	81.4
open-ended	106	97.2	84.9	72.6
Female -				
pre-coded	47	97.9	100.0	97.9
open-ended	45	100.0	95.6	86.7

Race

Reply rates for caucasian and non-caucasian interviewers used in the initial data collection.

	n	Age	Personal Income	Household Income
		(%)	(%)	(%)
Caucasian -				
pre-coded	83	96.4	94.0	84.3
open-ended	92	97.8	90.2	78.3
Non-caucasian -				
pre-coded	61	100.0	95.1	90.2
open-ended	59	98.3	84.7	74.6

APPENDIX SEVEN

An Estimation of the effect of the Survey Content and the Interviewer on the Difference in Reply Rates for Income Questions

The objective of this analysis was to provide estimates of the effect that the interviewer and the contents of the questionnaire have on the difference of the reply rates between open-ended and precoded income questions.

The dependent variable was the difference in the reply rates obtained by the open-ended and precoded questions.

The analysis was carried out using the statistical computing package GENSTAT. The output obtained from the analysis is presented below.

VARIATE: Reply to Personal Income Question

SOURCE OF VARIATION	DF	SS	SS		
UNITS STRATUM					
Survey	3	4.2897	2.01	1.4299	2.029
Interviewer	12	12.4838	5.85	1.0403	1.476
Residual	279	196.6028	92.14	0.7047	
TOTAL	294	213.3763	100.00	0.7258	
GRAND TOTAL	294	213.3763	100.00		
Grand Mean		1.264			

Total Number Of Observations   295

***** INFORMATION SUMMARY *****

ALIASED MODEL TERMS
SURVEY.INTERV

***** TABLES OF MEANS *****

VARIATE: Reply to Personal Income Question

    GRAND MEAN   1.264

          SURVEY   1   2   3   4

                    1.396   1.270   1.060   1.180
            REP   106   89   50   50

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	Survey	Interviewer
REP	UNEQUAL	UNEQUAL
SED	0.1679	0.3957X MIN REP
	0.1440	0.3044 MAX-MIN
	0.1153X	0.1696X MAX REP

(NO COMPARISONS IN CATEGORIES WHERE SED MARKED WITH AN X)

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
UNITS	279	0.8394	66.4

1

***** ANALYSIS OF VARIANCE *****

VARIATE: Reply to Household Income Question

SOURCE OF VARIATION	DF	SS	SS		
UNITS STRATUM					
Survey	3	21.177	5.33	7.059	5.553
Interviewer	12	21.169	5.33	1.764	1.388
Residual	279	354.692	89.33	1.271	

TOTAL	294	397.037	100.00	1.350
GRAND TOTAL	294	397.037	100.00	

Grand Mean   1.549
Total Number Of Observations   295

***** INFORMATION SUMMARY *****

ALIASED MODEL TERMS
SURVEY.INTERV

***** TABLES OF MEANS *****

VARIATE: REPHI

GRAND MEAN   1.549

SURVEY	1	2	3	4
	1.849	1.573	1.240	1.180
REP	106	89	50	50

***** STANDARD ERRORS OF DIFFERENCES OF MEANS *****

TABLE	Survey	Interviewer
REP	UNEQUAL	UNEQUAL
SED	0.2255	0.5315X MIN REP
	0.1934	0.4089 MAX-MIN
	0.1549X	0.2278X MAX REP

(NO COMPARISONS IN CATEGORIES WHERE SED MARKED WITH AN X)

***** STRATUM STANDARD ERRORS AND COEFFICIENTS OF VARIATION *****

STRATUM	DF	SE	CV%
UNITS	279	1.1275	72.8

APPENDIX EIGHT

Interviewer Attitude Questionnaire

Good morning/afternoon my name is Joanna Bowbyes. I am from the Marketing Department at Massey University. We are conducting research on interviewers' attitudes towards asking certain types of questions. We asked all the research companies to provide us with a list of their interviewers to use as a sampling frame for this survey. You were drawn from this to be part of the sample. Do you mind if I take a few minutes of your time to ask you some questions? Thankyou.

Part One - Interviewer Experience

1 Approximately how many surveys have you worked on in past 12 months, that is since June 1983? [   ]

I am now going to ask you some questions about each of these surveys. First we will start with the most recent survey that you have worked with an then work back from there.

2 a) When approximately did you conduct the interviewing?

   b) What was the subject of the survey?

   c) Was the interviewing face-to-face or by telephone?

   d) Which research company were you conducting the survey for?

   e) How many interviews did you complete?

   f) When you asked for the age of the respondent did you ask for their actual age or did you use a number of groups for the respondent to show which group he or she belonged in?

   g) How about for the income questions?

h) What kind of briefing did you receive before the survey was started?

DATE	SUBJECT	PERSONAL :TELEPHONE:	COMPANY	:N OF INTER: : VIEWS :	ACTUAL OR GROUPED age :income	: BRIEFING : :
:	:	: :	:	: :	: :	:
:	:	: :	:	: :	: :	:
:	:	: :	:	: :	: :	:
:	:	: :	:	: :	: :	:
:	:	: :	:	: :	: :	:
:	:	: :	:	: :	: :	:
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:	:	: :	:	: :	: :	:
:	:	: :	:	: :	: :	:

Part 2 - Interviewer Attitudes

3 On this scale (show card) could you please tell me your views on the following statements.

Asking people their exact income in a questionnaire is an invasion of their privacy.   [   ]

Asking someone for his or her actual income makes me feel awkward.   [   ]

Asking someone to mark their income on a grouped scale is less embarrasing for me than to ask for their actual income.   [   ]

Asking someone for his or her age or date of birth in a questionnaire is an invasion of their privacy.   [   ]

Asking someone for their actual age or date of birth makes me feel awkward.   [   ]

Asking someone to mark their age on a grouped scale is less embarrassing for me than to ask for their actual age. [   ]

I now want to ask you some questions about you and your

household. All of the information that you give me, as with the rest of the questionnaire, will be strictly confidential.

4 What is your date of birth? .../..../.....

5 In what country were you born? ....

6 How many years have you lived in New Zealand? ....

7 On this card (show card) can you please tell me which level of education that you received. [   ]

8 a) In what year did you begin interviewing? ....

   b) Who was the company that you first worked for as an interviewer?

   c) What training did you receive then?

   d) What training have you received since then?

9 What is the occupation of the chief income earner of your household?

    ....

APPENDIX NINE

Stage One Questionnaire Examples

This appendix contains examples of the typical age and income questions used in the various questionnaires for the first stage of the research. The examples provided show the demographic questions asked for both versions of the questionnaire.

The width of the intervals used in the precoded versions of the questionnaires were the same for each survey. That is, $5000 intervals for income, and five year intervals for age. See the precoded version of the Manawatu Museum telephone questionnaire for the format an example of the width and starting points of each interval.

Manawatu Museum Telephone Questionnaire

Open-ended Version

Now I would like some information about yourself. Do please remember that all the replies you give will remain completely confidential.

11 Do you live in Palmerston North city?   Yes [ ]   No [ ]
IF NO, ASK
  Which county do you live in?

Feilding	[ ]
Horowhenua County	[ ]
Kairanga County	[ ]
Kiwitea County	[ ]
Levin County	[ ]
Manawatu County	[ ]
Oroua County	[ ]
Pohongina County	[ ]
Other	[ ]

12 What is your occupation? _____

13 In what year were you born? |__|__|

14 Roughly, what is your personal annual income before tax?

$\text{\$}\underline{\hspace{2cm}}$

15 And roughly, what is the total annual income of the whole household?

$\text{\$}\underline{\hspace{2cm}}$

Thank you very much. Although all your answers are completely confidential, is there anything you would like us to pass on to the Museum?

Precoded Version

Now I would like some information about yourself. Do please remember that all the replies you give will remain completely confidential.

11 Do you live in Palmerston North city?   Yes [ ]   No [ ]
IF NO, ASK
  Which county do you live in?

Feilding	[ ]
Horowhenua County	[ ]
Kairanga County	[ ]
Kiwitea County	[ ]
Levin County	[ ]
Manawatu County	[ ]
Oroua County	[ ]
Pohongina County	[ ]
Other	[ ]

12 What is your occupation? _____

13 I will read you a list of age groups. Please indicate which one of these you are in.

15-19	[ ]	45-49	[ ]
20-24	[ ]	50-54	[ ]
25-29	[ ]	55-59	[ ]
30-34	[ ]	60-64	[ ]
35-39	[ ]	65+	[ ]
40-44	[ ]		

14 I will now read you a list of income groups. Please indicate to me which one your personal income is in.

15 I will read the same list. Please indicate which group the total household income is in.

	P	H		P	H
under 5001	[ ]	[ ]	25001-30000	[ ]	[ ]
5001-10000	[ ]	[ ]	30001-35000	[ ]	[ ]
10001-15000	[ ]	[ ]	35001-40000	[ ]	[ ]
15001-20000	[ ]	[ ]	40001-45000	[ ]	[ ]
20001-25000	[ ]	[ ]	45000+	[ ]	[ ]

Thank you very much. Although all your answers are completely confidential, is there anything you would like us to pass on to the Museum?

Centrepoint Theatre Questionnaire

Open-ended Version

Now I would like to ask you a few questions about yourself to ensure that we have a representative sample of the population.

Q20 Sex   M _   F _

Q21 What is your occupation?

Q22 What is your date of birth? ..../..../...

Q23 What was your income for the past 12 months before tax? $.......

   And what was the households gross income for the same period? $....

Precoded Version

Now I would like to ask you a few questions about yourself to ensure
that we have a representative sample of the population.

Q20 Sex   M _   F _

Q21 What is your occupation?

Q22 On this card can you please tell me what age group that you are in.
          [   ]

Q23   On this card can you please tell me which group your personal
      income for the past year before tax was in.
          [   ]

      And what group was the households income before tax for the same
      period in?
          [   ]

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