Session Paper

Transportation Surveys Among Illiterate and Semiliterate Households in South Africa

Patricia van der Reis
TRC Africa (Pty) Ltd.

ABSTRACT

Transportation surveys have been conducted in South Africa for the past twenty years. This paper examines some of the problems and difficulties experienced in undertaking surveys among illiterate and semiliterate commuters. Qualitative research techniques were used to probe the nature and extent of these problems. The stated preference (SP) technique was used as an example of how particular problems may be minimized. The most serious problems identified were the lack of a sampling framework, the difficulty of language equivalence and unfamiliar terminology, respondent suspicion of the survey objectives, respondents' fear of making mistakes and giving wrong answers, lack of familiarity with rating-scale techniques, difficulty in conceptualizing SP trade-off options, and negative attitudes toward omitted or perceived-as-unfair SP choices. Solutions recommended include the use of maps derived from aerial photography for sample frameworks; the observance of local customs and structures; empathetic interviewers with knowledge of the respondents' language; the use of qualitative techniques to uncover concepts, terminology and procedures that are unfamiliar to respondents; and the development of methods to aid explanation of the survey purpose and process. It is suggested that, apart from developing countries, these findings and solutions are applicable to the marginal populations of developed cities.

INTRODUCTION

Transportation surveys have been undertaken in South Africa for the past twenty years. These surveys have principally been aimed at obtaining information on public transport usage and the travel patterns and attitudes of low-income commuters, who are very largely dependent on public transport for the journey to work. Many of these commuters are illiterate or semiliterate. The latest published census figures reveal that 34 percent of the South African population can be classed as illiterate (with no education, or up to Std 2), a further 20 percent are semiliterate (with a primary school education between Std 3 and Std 5), and the remaining 46 percent are literate.

Stopher *(1)* noted that the behavioral aspects of modern transport planning approaches are based on Western concepts of economics and psychology, and that these concepts may not necessarily be transferable to developing countries. This observation, together with the failure of some early transport surveys to produce valid and reliable data capable of reproduction in repeat surveys, stimulated exploratory research into the transferability of survey procedures used in other developed and developing countries.

This paper examines problems experienced in surveys among illiterate and semiliterate South Africans, and looks at the methods developed to overcome or minimize them. Problems associated with sampling, respondent selection, questionnaire design and

interviewing procedures are considered in turn. The second part of the paper focusses on stated preference techniques and how problems experienced in the field were overcome in practice.

The findings reported in the paper are not only applicable to developing countries, but also increasingly to surveys of marginal populations in developed cities. Indeed, some of the problems are germane to societies with a relatively high level of literacy, as well.

SAMPLING PROBLEMS AND PROCEDURES

The major sampling problems experienced in surveys among illiterate and semiliterate commuters have been:

- There is often no convenient listing of the universe in directories or at local authorities, because of low telephone ownership and the fact that few of these households pay rates and taxes;
- Streets in the many informal settlements are unnamed, and houses unnumbered, which makes sampling points difficult to describe and to identify in the field; and
- Even in formal residential areas, there is sometimes multiple occupation of houses and plots, because of the extended-family system among Africans, and the subletting of rooms and shacks in backyards to increase income.

To overcome these problems, use is generally made of aerial photographs that, together with the latest census figures and local authority updates, make it possible to obtain a good idea of the number and spatial distribution of housing and people in an area.

Samples for travel surveys in South Africa, are usually area-stratified, clustered probability samples of households, the sampling points being selected using random numbers and maps derived from the aerial photographs. Households are defined as one or more persons who pool their incomes to buy food, live, eat and sleep together in one or more houses/huts/living units on the same plot/site, and who depend financially on one another (Slabbert and Levin, *2*).

RESPONDENT SELECTION

At each plot or site selected for inclusion in the sample, the presence of an owner, main tenant and any backyard tenants is established, and the structure of households by age and gender noted. Fieldworkers are supplied with a specific procedure for selecting the household (if more than one resides on the plot) and for identifying the particular respondent to be interviewed.

Several problems have emerged in the selection of less-literate respondents.

Interview Bias in Substitution of Not-at-Homes

It has been found that strictly probability methods of selecting substitute respondents need to be supplemented by quota controls. This is because of the well-known tendency for not-at- homes to occur more frequently among certain types of respondents (workers, males and young people, but especially migrant workers traveling weekly or monthly to work).

To avoid biasing the sample toward the less mobile, quota controls are established. One way used is to apply quota controls by gender and age on the basis of official statistics, which ensures that the correct proportions of men and women of all age groups are included in the survey. Another way commonly used is to stipulate that the known proportion of public transport commuters is included in the sample.

Refusals

Refusals to participate in surveys are rare. When they occur, they are mainly due to the less literate being afraid of getting involved in something possibly political. One of the legacies of the apartheid era is a fear of perceived government agents. This fear can also, however, be due to intertribal/political party mistrust. There is often a conflict between these fears and the respondents' normally encountered desire to please the interviewer.

Fieldworkers are usually able to overcome these fears by explaining to the family that the survey is a community service, and by reasuring them of the confidentiality of their information. A few will remain unconvinced (about 3 percent). This is, however, generally lower and less of a problem than is the case in highly literate populations.

The Need To Get Permission for the Survey from Tribal Leaders

Babamia and Mkhacane (*3*) recorded that rural people have great respect for the tribal system and for tribal leaders. Before surveys can be commenced, it is often necessary to obtain permission from the local tribal leader. This involves explaining the background to, and the reasons for, the study. Conducting survey interviews with leaders is found very helpful in terms of:

- Explaining the contents of the questionnaire;
- Convincing them of the nature and aims of the survey; and
- Finding out which questions or issues may be sensitive.

Once permission is obtained, and the community is aware of the study, conducting the survey usually proceeds smoothly. Leaders have the ability to convince their followers of the value of the survey. If for some reason permission is not granted, the sample may become biased, as many respondents may refuse to take part.

Poor Response to Recruitment Procedures

It has often been found that when commuters are canvassed at a station, bus stop or elsewhere to attend a group interview at a certain venue, very few turn up. Apart from the level of interest in the topic of the survey, care has to be taken that the venue is accessible and appropriate, and that the day and time of the group interview are also acceptable. This problem can be overcome by recruiting more people than required, or by offering a monetary remuneration. Even with a monetary remuneration, however, it has been found that on average only 23 percent in South Africa will attend a group interview session (Stewart Scott, *4*). Recruiting less-literate respondents for a specific venue and time has seldom proved successful in South Africa.

QUESTIONNAIRE DESIGN

Many types of questions have been included in transport surveys in South Africa: multiple choice, open-ended, ranking procedures, rating scales, trade-offs, revealed and stated preference techniques, etc. However, this is a potential minefield for the researcher, interviewer and less-literate respondent, with a number of problems surfacing.

The Language Issue and Translation

No fewer than 24 languages are spoken in South Africa, and there are 11 official languages (English, Afrikaans and nine African languages). This presents obvious problems with the equivalence of translations. It is also very cumbersome for the interviewer to carry many versions of the questionnaire around, and, indeed, to be able to explain concepts and response options to the respondents in all the languages, even though many interviewers speak five or six languages. There is, in addition, the problem of the lack of certain terms in some African languages. For example, there is no word for the concept of *importance* in Northern Sotho, which has to be explained in a roundabout way.

Lack of Familiarity with Transportation Terminology

Terms such as *convenience, reliability, frequency, efficiency* and *comfort* are not always interpreted by the less literate (and, indeed, even by the literate) in the same way as transportation engineers and researchers, or even in a consistent manner among them. An example of this in the South African context is given in Table 1, for the term *convenient* (Van der Reis, unpublished).

The variety of different meanings given to the term *convenient* within the same language group is astounding, as well as the fact that the most popular meaning differed between the language groups: "close to home" for the English, "uncrowded" for the Afrikaans, and "close to work" for the Xhosas.

It is obviously necessary to use practical, everyday terms in surveys rather than transport jargon, and, where necessary, to define the meaning of terms that may appear unclear to less-literate respondents. Back-translation of questionnaires helps to ensure that terms are equivalent in meaning in the various languages.

TABLE 1 Meanings Attributed to the Term "Convenient" by English, Afrikaans, and Xhosa

Respondents, 1985

	% of Respondents		
Meaning	**English**	**Afrikaans**	**Xhosa**
Close to Home	**49**	**13**	**14**
Close to Work	**19**	**9**	**33**
Uncrowded	**7**	**36**	**12**
Frequent	**6**	**0**	**6**
Cheap	**5**	**0**	**6**
Safe	**0**	**11**	**0**
Soft Seats	**5**	**11**	**8**
On Time	**0**	**7**	**10**
Other	**9**	**13**	**11**

Lack of Familiarity with the Issues and Interrelationships They are Being Asked to Judge

Less-literate respondents are often largely unaware of the relationships between transportation issues. They have usually simply not thought about such relationships before, and are therefore unable to make valid judgements based on previous experience and due consideration of all the issues and implications.

Questions such as "If the roads in your area were improved, would this benefit (food prices in the shops/the cost of transport, etc.) a lot, a little or not at all?" are generally extremely difficult for less-literate respondents to answer. Their response is usually to:

- Say "I don't know" to all the issues, which could of course, in itself, be a valid finding;
- Say "a lot" to all the issues (the halo effect), in the belief that this was what they were expected to say, and that saying so would please the interviewer; or
- Become annoyed or embarrassed (because of their inability to understand and to answer the question), and refuse to answer it.

Such questions are rephrased as a series of simpler questions. For example:

- If the roads in your area were improved, would this benefit you?
- In what way would you benefit? and
- Would you benefit a lot or a little? (Asked of each way mentioned.)

The ways in which they believe that they would benefit a lot are then ranked in order of greatest to least benefit.

Difficulty in Understanding a Column-and-Row Matrix

Less-literate respondents are not usually familiar with writing answers in designated spaces in a self-completion task. This has resulted in answers' being written in the incorrect space, which is obviously a serious problem. This has been overcome by using separate postcard- size answer sheets for each question, put in chronological order in an envelope and taken out one by one. Sometimes use is made of different coloured paper for various topics (Stewart Scott, *4*). At other times, the interviewer will simply complete the matrix according to the answers given by the respondent.

The Use of Rating Scales is Often Unfamiliar

Research in developing countries (Grigg, *5;* and Van der Reis, *6, 7*) has highlighted the many difficulties associated with the use of rating scales to measure traveller attitudes toward the transport system in those countries.

The author's study of the most appropriate rating scale to use in South African transportation surveys revealed the following.

- *The Basic Concept of a Rating Scale and of Degrees of Comparison was Unfamiliar to the Less Literate.*

Respondents would say, "You are either happy or unhappy, so it is not necessary for so many words to say how you feel." Even the literate sometimes said you cannot distinguish

these differences of feeling in words; it is a matter of intonation and emphasis in African languages. And, indeed, the researcher will have difficulty in finding equivalents for the terms "extremely," "very fairly," "slightly," etc., in African languages.

- *Short Verbal Rating Scales Are the Most Valid and Reliable Measures To Use*

A scale such as "satisfied-unsure-dissatisfied" is a better measure than any of the nonverbal rating scales (numerical, pictorial or graphic line), all of which cause confusion among less-literate respondents and need considerable explanation before respondents will attempt to use them. Mostly, they want the numbers, smiling faces or parts of the continuous graphic line explained in words, after which they respond in words and leave the interviewer to mark the appropriate alternative or position on the line. Nonverbal rating scales are obviously not independent of language when responded to in this way.

- *Numerical Rating Scales Are the Second-best Type of Scale To Use*

These scales suffer, however, from the need to explain the concept of marks to illiterates (who are usually also innumerate). Even among the semiliterate, the middle or neutral concept is often unfamiliar, and the number 1 perceived as the highest rather than the lowest mark.

- *Pictorial Rating Scales Are Less Reliable To Use*

Scales such as the well-known Smiley series of increasingly happy and unhappy faces are often regarded by the less literate as childish and belittling, which results in a negative attitude toward the whole interviewing process. In addition, it has been found that the pictorial representations of sad and neutral expressions are far less easily identified by these respondents than are happy faces, suggesting that only the positive half of the scale is familiar and is consequently more frequently used, distorting the interpretation of the respondents' feelings.

- *Graphic Line Rating Scales Are the Most Difficult of All*

The concept of a continuous line scale between extremes is invariably unfamiliar to less-literates, and, as already mentioned, respondents often ask for verbal explanation of what the positions on the line mean. The self-completion nature of the task adds to the reluctance of illiterates to respond, not being used to using pen and paper.

One can conclude that the so-called "culture-free" or "culture-fair" rating scales (not requiring literacy or numeracy) have their own, often more serious problems, and cannot simply be assumed to be appropriate without in-depth testing.

INTERVIEWING AND PROCEDURAL PROBLEMS

Babamia and Mkhacane (*3*) have noted a number of respondent problems among less-literates in South Africa that have a direct bearing on interviewer-respondent rapport. These include:

- Nervousness and feelings of inadequacy. Some less-literate respondents become extremely nervous at the start of an interview. This is based on a fear of not knowing what is expected of them and a fear of being penalised for mistakes, or of appearing stupid. This fear is reduced by presenting the easiest, less sensitive questions first, to put the respondent at ease, and through reassurance from an empathetic interviewer;
- Hesitancy to participate due to skepticism or distrust. Obtaining the cooperation of tribal leaders and explaining the purpose of the survey usually overcomes these difficulties;

- Lack of interest. In this case the value of the survey to the community is stressed;
- Lack of full understanding of the questions, even though they may be asked in their home language. This is minimized by providing definitions and explanations;
- Living incorrect information knowingly, due to the perceived sensitivity of the question, particularly as regards income. This is overcome through assurances of confidentiality; and
- Providing what they perceive as the expected response, rather than responses that reflect their true feelings. This is usually avoided through assurances that there are no "right" or "wrong" answers.

Because of all these dificulties, interviews among illiterates and semiliterates tend to be about 40 minutes to an hour in length.

STATED PREFERENCE TECHNIQUES

Stated preference (SP) techniques have been used quite extensively among the less literate in South Africa to investigate travel choice behavior (Clark, *8*; Stewart Scott, *4*). It has been found, however, that less-literate respondents easily become confused, flustered and ill at ease when faced with making choices among often rather complex SP options. To overcome their fears and ensure valid data, a relaxed environment is provided, without time constraints. The interviewer or group moderator gives a detailed explanation of the procedure to be followed, and provides definitions of the attributes and the varying levels of attributes, in order to standardize as best as possible the interpretation of the atttributes and options by the different respondents.

The most important attributes to be traded off in the SP procedure are usually determined from a combination of the findings of earlier transport research among semiliterates, from open-ended individual interviews and from focus groups in the particular geographic area being studied. Clark (*8*) has noted the need to make the attributes to be judged realistic and customized to the respondent's experience, and that the difference in the values of the attributes should cover the range of valuations held by the respondent. Appropriate focus groups are used to test meaningful levels, and differences between the levels of the attributes. Paying conscientious attention to this important initial phase greatly contributes to the quality of the data.

While a full factorial design would obviously be very time-consuming and expensive (and undoubtedly lead to respondent fatigue, boredom and less-well-considered choices), there are also some characteristics of less-literates that make the normal manner of reducing the number of SP choices inadvisable.

Wanting Their Say on Dominant Options

Stewart Scott (*4*) found that when the dominant option (that all other rail attributes were improved, but the fare remained constant) was removed from the set of options, respondents became very angry. As they perceived it, leaving out the main option, that the South African Rail Commuter Corporation make long-overdue improvements to their substandard service without its costing the commuter an arm and a leg, denies them the right to have their say and causes the whole survey to be seen in a negative light. The dominant option has therefore to remain in SP surveys among the less literate.

Becoming Annoyed When Presented with Perceived Unfair Options

The inclusion of the least-dominant option (that fares increase without improvements being made to any other service attribute) annoys many respondents, who regard this option as grossly unfair. It colours their attitude toward the whole SP task. This is, to some extent, overcome by using small levels of fare increases rather than a relatively large increase, in order to determine fare sensitivity.

A Very Dominant Attribute Causes Others To Be Totally Ignored

Rail studies in South Africa in recent times have revealed that personal safety from crime dominates all other attribute improvements that might be introduced. The result is that when safety from crime is presented to respondents in conjunction with perceived less-important attributes, the latter tend to be totally ignored, resulting in an insensitivity of the findings regarding less-dominant options. This is overcome by presenting the sets of less-dominant attributes in a separate experimental procedure prior to that containing the very dominant attribute.

Some Attributes Are Unfamiliar

Illiterate and semiliterate respondents in South Africa are seldom familiar with distance measurement. They are not usually able to say how far they walk to reach their transport, or the distance between their homes and the workplace. Far better known is the time it takes to travel these distances.

Difficulty in Conceptualizing Trade-off Options

Having to choose between two combinations of different values of three or more attributes in an SP procedure is not an easy task for illiterates and semiliterates. Most respondents require lengthy explanations of the combinations and of the task they have to fulfil. This has been overcome in South Africa through the following.

The Use of Overhead Projector Slides

Slides are shown portraying each choice situation separately, permitting explanations and allowing all the respondents in a group session to make their choice before moving on to the next question. This approach is successful among semiliterates, but time-consuming. For illiterates, this technique is impossible, and personal interviews with careful explanation are the only alternative.

Asking Respondents To Compare Their Existing Situation with an Improved Situation

This is an easier task than comparing two unfamiliar situations, although requiring a lengthier interview. Respondents are further assisted by having them fill in a calibration sheet at the start of the interview, noting, for example, their current travel times and fares, and the values of the various attribute levels that are to be presented to them during the SP procedure. This provides them with a meaningful frame of reference to which they can refer during the procedure (Stewart Scott, *4*).

Ensuring That Differences in the Set of Fare Levels Are Realistic According to the Perceived Price Elasticities Related to the Attributes

Differences in fare levels were initially found to be too small to measure respondents' sensitivities toward personal safety in the Stewart Scott study, and too large to measure sensitivities to travel time. In the end, three experiments were conducted, each with a different but relevant set of fare levels. Table 2 shows the questionnaire design (with safety only featured in the third experiment) and the answer sheet.

TABLE 2 Example of Questionnaire Design and Answer Sheet for Stated Preference Surveys

Experiment 1 **Question 1**

Fare	**Travel Time**
R2,00 more	10 minutes less

Experiment 2 **Question 1**

Fare	**Travel Time**	**Feeders**	**Crowding**
Existing	10 minutes less	Provided	Not crowded

Experiment 3 **Question 1**

Fare	**Travel Time**	**Frequency**	**Safety**	**Crowding**
R10,00 more	10 minutes less	Existing	Very good	Not crowded

Answer Sheet

Experimental Group 8 **Respondent 58**

Experiment 1

Question 1

Train	Bus	Taxi	Other

In summary, SP techniques have been used among semiliterates, but are very difficult to use among illiterates. If SP data are to be valid measures of potential behavior, the question format needs to take into account not only comprehensibility and realism, but also the possible negative feelings engendered in the respondent.

CONCLUSIONS

Illiterate and semiliterate households pose a challenge for survey researchers worldwide. The most serious problems in South Africa include:

- Lack of a readily available sampling framework;
- Respondent suspicion of survey objectives;
- Fear of making mistakes and giving the wrong answer;
- Difficulty of language equivalence and familiar terminology;
- Use of unfamiliar rating scales;
- Difficulty in conceptualizing SP trade-off options; and
- Negative attitudes toward omitted or perceived-as-unfair SP choices.

These problems can be overcome or minimized. Principal recommendations are:

- The development of innovative ways to obtain sample frameworks, such as maps derived from aerial photography;
- The observance of local customs and structures;
- The use of empathetic interviewers able to converse in the respondent's language and provide reassurance and encouragement;
- The use of qualitative research techniques to uncover the extent of familiarity with concepts, terminology and response formats;
- The design of questionnaires and procedures that take account of respondent sensitivities, familiarities and limitations; and
- The development of methods and aids to ensure adequate explanation of the terminology, techniques and procedures is given to the respondent, in order to elicit valid and reliable information.

In this way, transport researchers planning surveys among illiterate and semiliterate populations can avoid the many pitfalls that bedevilled some of the early transport surveys. It is strongly recommended that similar research be undertaken on some of the marginal populations in developed cities.

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