UNDERSTANDING TRAVEL SURVEY DATA VALIDATION

Elizabeth AMPT
State Transport Study Group of New South Wales

Wolfgang BLECHINGER
Sócialdata
West Germany

Werner BRÖG
Socialdata
West Germany

Hans MESSELINK
Office of Air Travel
Ministry of Transport
The Netherlands

ABSTRACT: *Travel data in one form or another are constantly being used by all persons working in the area of transportation planning. The quality of the data used is, however, rarely considered until problems at the stage of modelling or analysis point to data inadequacies. These are usually dismissed as irreparable, often casting doubts on the survey process in general.*

The methodologies for validating raw survey data which have now been developed, together with the availability of a wide range of secondary data, no longer allow data problems to be ignored.

This paper shows the importance of understanding and validating travel survey data by using examples from two countries where parallel surveys have collected similar information but have produced strikingly different results. The reasons for these differences are discussed in detail and it is concluded that correction of travel survey data must be seen as an integral part of any survey methodology if the survey aims to produce valid, usable data.

UNDERSTANDING TRAVEL SURVEY DATA VALIDATION

INTRODUCTION

Travel survey data in one form or another are constantly used by all persons working in the area of transportation planning. These users are sometimes aware of the complex processes surrounding the survey - its design, execution and the final evaluation of results - though more frequently they are essentially uninitiated in the survey process, but need reliable data quickly. The quality of the data used is, therefore, rarely considered until problems at the stage of analysis, modelling, or forecasting point to data inadequacies. Quite often the user of such data will puzzle over their own typically unproven ad-hoc explanations as to what mistakes by the survey designer and administrator might have produced these results. And it is not uncommon to conclude that empirical surveys per se are simply rather dubious undertakings.

What causes these problems in travel data? Detailed analysis of course, will point to numerous stages where the blame for poor quality can be apportioned. In almost all cases, however, the single most important factor underlying the problem is that both the persons responsible for survey design and analysis, and the unsuspecting user, do not understand that empirical data are only raw. Untouched, such data reflect all the inadequacies of sample selection, questionnaire design, normal (non-perfect) respondents, and so on. They almost certainly do not present an accurate measurement of the information sought, meaning that they are not valid. In other words, if the survey methodology does not include a careful analysis of the data and a corresponding attention to these problems, the results will be far from representing reality. Even with correction measures, such as those which will be described in this paper, the data will only be closer to reality - never exactly representative of it!

This paper sets out to show the importance of understanding and validating travel survey data. First, it describes results which showed important differences (e.g. in levels of mobility) between three survey methodologies in the Federal Republic of Germany. It then goes on to note the essentially negative reactions to these results by both the research and user communities. And finally it presents a set of remarkably parallel results which were achieved when three similar surveys were examined in the Netherlands, thereby confirming the importance and effect of the survey method, at the same time highlighting the need for validation techniques in all surveys of travel behaviour.

AMPT, BLECHINGER, BRÖG, MESSELINK

THREE SURVEYS OF HOLIDAY TRAVEL IN THE FEDERAL REPUBLIC OF GERMANY

Description of the Surveys

In 1981 a report by the social science research institute, Socialdata, describing and comparing the results of three large travel surveys, all on the same topic, was released (Socialdata, 1981). Not only did the surveys cover the same subject matter, namely holiday travel, but they were also conducted during the same time frame. These three surveys were:

(i) A survey by the Federal Statistics Office (FSO) (1979) in connection with the so-called Microcensus,

(ii) A survey by the Study Group for Tourism (1980) called Travel Analysis (TA), and

(iii) A survey by Socialdata (1981) in the context of total private long-distance travel (KONTIFERN).

The most important characteristics of the surveys are summarized in Table 1, and a detailed discussion of the comparison appears in Brög and Meyburg, 1982.

Table 1. Characteristics of three comparable surveys of holiday travel

SURVEY CHARACTERISTIC	KONTIFERN (1)	FSO(2)	TA(3)
Population	German population of Fed. Rep. of Germany (57 Mio)	Total population of Fed. Rep. of Germany (61 Mio)	German population older than 15 years (46 Mio)
Sample Size (gross)	Approx.40,000 persons	Approx. 60,000 persons	Approx. 6,000 persons
Definition of Holiday Trip	At least 5 days' duration; classified by respondents as "Holiday trip."	At least 5 days' duration, not for business purposes but including social visits and trips to second homes.	At least 5 days' duration, not for business purposes.
Reporting Period	5/1978 to 4/1980	4/1978 to 3/1979	Jan to December 1979
Reporting Dates	By quarters spread over the year (multiple survey dates)	April 1979 (one survey date)	January/February 1980 (one survey date)
Survey Method	Mail back, voluntary no proxies allowed.	Interview, mandatory, proxies allowed	Interview, voluntary, no proxies allowed.
Evaluation Methods	Representativeness, reliability, validity	Representativeness	Representativeness

(1) KONTIV Survey for personal intercity travel. (2) Survey by German Federal Statistics Office. (3) Survey (Travel Analysis) by the Study Group for Tourism, Federal Republic of Germany

The population base for each survey was slightly different and the gross sample size for the TA survey was substantially smaller than that for the other two surveys. Since it is known that the significance of a survey result increases only with the square root of the sample size, the tenfold size of the FSO survey compared to the TA survey would only have resulted in a threefold increase in statistical significance. The definition of holiday travel, and the reporting periods, on the other hand, were quite comparable.

Important differences in survey method did, however, exist. For the FSO survey there was a legally compulsory response requirement enforceable by the Federal Statistics Office. This was not the case with the other two surveys. The response effects which are considered important in other contexts (Brög and Meyburg 1981a) were therefore expected to be practically non-existent in the FSO case. By contrast it could be assumed that for a voluntary interview survey, such as the TA survey, the share of the more mobile persons, and therefore the total volume of holiday travel, would be under-reported, even after the customary sociodemographic weighting of results. The effects of non-response were expected to be completely reversed and the number of forgotten or non-reported trips decreased by about half for voluntary, written, mail-back surveys such as the KONTIFERN survey (Brög and Meyburg, 1981b). Finally, the FSO survey allowed proxy responses when gathering holiday travel information about the whole household, which is known to result in substantial under-reporting in travel-related surveys (Brög, 1979). In addition, it was noted that the requirements for respondents to remember trips over the period of one year was expected to lead to further reporting losses in all three surveys.

The report which compared the three surveys noted that even though all of them offered representative results (i.e. representative of the responses received), the results of all three differed substantially. The influence of the methodological effects was illustrated by means of the three commonly used descriptors of holiday travel (Table 2):

Table 2. Comparison of travel characteristics by survey

CHARACTERISTIC	KONTIFERN	FSO	TA
Travel Intensity	59.5%	47.5%	57.1%
Travel Frequency	1.47	1.29	1.21
Total Travel Volume (per 1,000 pop.)	875	613	691

(i) Iravel intensity (the percentage of the survey population which undertook at least one holiday trip in the preceding year),

(ii) Iravel frequency (the average number of holiday trips by persons who made holiday trips),

(iii) Iotal travel volume (calculated to reflect the total number of holiday trips per thousand persons).

It was argued in the report that the effects of the survey design documented from previous empirical studies (e.g. Moolman, 1979; Brög, et. al., 1982) - had shown that corrections to the raw data were necessary to obtain valid results even when the questionnaire design, wording and all operational phases had been subjected to thorough testing. The application of these corrections had occurred in only the KONTIFERN study. Corrections to this survey (mail-back questionnaire design) suggested that there was a 4% over-reporting of travel intensity and a 2% over-reporting of travel frequency, with a resultant 7% over-reporting of total holiday travel. Furthermore, had only socio-demographic correction occurred, without corrections for non-response and non-reported trips, only about half of this adjustment would have been possible. Rough estimates on the way that corrections would have affected the other surveys suggest that modifications of up to 30% would have to be made to rectify under-reporting.

The report concluded that choice, format, and content of a survey method can have important effects on the type and scale of answers to be expected in empirical survey results, at least in the context of long-distance holiday travel in Germany. In particular it was concluded that non-response and under-reporting, the most common sources of systematic error, can be minimised by careful choice of the survey method and by applying systematic correction.

The Reception to the Report

When the results of this comparison were first released in Germany, they were greeted with what amounted to disbelief. Most research groups had been using the techniques which were being challenged for 20 years and did not accept that it was possible to criticize results in this manner. The most threatening feature of the new results was that they were openly stating that no survey actually reports reality. In other words, they were asking those persons who carried out surveys to suggest to others that their own data had errors and were not valid without correction. The few that accepted the comparison as valid, found its release indiscrete and suggested that it should perhaps be withheld.

A PARALLEL EXAMPLE: THREE SURVEYS IN THE NETHERLANDS

Despite the overall negative reaction in Germany, a completely different reaction was registered in Holland when, virtually by chance, the Dutch Ministry of Transport noticed that it too had three similarly comparable, methodologically different studies from its own country. The Dutch Ministry, interested in testing the hypotheses based on the German findings, then commissioned the firm of Socialdata to carry out a comparison of its three surveys (Brög and Blechinger, 1982), the results of which will be described in detail.

Problem Definition

Holiday travel data have been collected in the Netherlands for many years by different research institutes. It had been observed, however, that in the data alone there were significant differences, which naturally produced even greater differences in the prognoses stemming from the different sources. The brief was, therefore, to examine the methodologies which had been applied and, with this background, to evaluate the results, at the same time demonstrating ways in which any distorted results could be corrected.

In order to ensure the accuracy of the analysis, the study team from Socialdata was able to discuss the project personally with the directors of all three surveys. In addition, numerous files were made available to enable detailed comparison of results.

The Ihree Studies

The three studies which are currrently being carried out in the Netherlands, are:

(i) A survey by the Central Bureau of Statistics on holiday travel (C.B.S.),

(ii) A continuous (PANEL) survey conducted jointly by the Netherlands Research Institute for Recreation and Tourism (NRIT) and the Institute for Social-Psychological Surveys and Market Research (INIERACT B.V.), and

(iii) A survey of air travel carried out for the Ministry of Iransport (AIR).

As in the German example, the three studies had different concepts and goals and the comparisons are necessarily qualified. All three, however, contribute to the presentation of a fairly comprehensive picture of the holiday travel behaviour of the Dutch population. Iable 3 presents the important characteristics of the three studies.

Conceptual design of the studies

Ihe C.B.S. study could be viewed as the "classical" survey of Dutch holiday travel behaviour patterns. It has been carried out since 1969 and deals only with holiday travel, basically according to its current international definition. Trips to stay with relatives or friends, however, are not considered. The PANEL study, on the other hand, has only been running since 1980. It aims to include not only past holiday travel, but also to compare planned holidays and their subsequent realisation (or non-realisation). A supplementary goal is directed at assisting with the early forecasting of developing trends. The AIR survey is confined to all air passengers leaving Holland (mainly from the Schiphol airport). It is not, therefore a truly holiday travel survey like the C.B.S. and PANEL surveys. It was, however, useful to include it in the comparison, since it contributed to the evaluation of results in several specific areas.

Table 3. Characteristics of the three Dutch surveys of holiday travel

STUDY CHARACTERISTICS	C.B.S.	PANEL	AIR
. Study Aims	To measure the previous year's holiday travel	To measure the actual and planned holiday travel	To measure the actual plane trips and the number of trips in the previous year
. Sample Frame	Dutch population	Dutch population	All persons starting plane trips in Holland
. Nature of Survey	Personal interviews	Written-mail Panel survey	Personal Short-interviews
. Sample Size	5,600 persons (1980) 6,000 persons (1981)	5,000 persons (1980/81)	Every 5th plane passenger (= c. 75,000 persons)
. Survey Period	Once a year (c. 1 Oct - c. 15 Dec)	Four times year (1 March, 1 June, 1 Sept, 1 Dec.)	2-3 x per year, each a week in different seasons
. Reporting Period	1 year (1 Oct - 30 Sept)	3 months	Actual trips and 1 year's previous trips
. Definition of Holiday Trips	At least 4 nights for the purpose of recreation - not including visiting friends/ family	At least 1 over-night 1-3 nights = short holiday 4+ nights = long holiday	Holiday travel, if recorded as such in the survey; visiting of family/ friends excepted. No. of nights asked independently
. Length of Survey	Since 1969	Since 1980	Since 1973
. Non-Response	26% (1980)	48% (1980) 36% (1981)	Unknown
. Form of Release	Released to the public	Limited to the panel participants	Not released

Survey design

The C.B.S. study is an annual personal interview survey of 4,000 responding persons selected from the entire Dutch population (i.e. not including foreigners living in Holland). The sample is based on persons, meaning that only a specific person in the household reports their own holiday travel even though the household composition is collected. Holiday travel data of persons under 15 may be reported by another household member. The specific interest of the C.B.S. study is in travel over the last 12 months although some questions about the last 5 years are also included. In addition, socio-demographic and household composition data are asked of all persons (including non-travellers). The non-travellers are dealt with in one question only.

In contrast, the PANEL survey is administered four times a year as a written-postal questionnaire. In 1981 the initial sample of 5,000 persons diminished to 3,208 persons who continued to participate into 1982. Those persons who dropped out of the sample were replaced with persons from the total panel (comprising about 15,000 persons selected by interview) with similar socio-demographic characteristics.

The scope of the PANEL survey is the last three months of actual holiday travel and the next 18 months of planned travel. As with the C.B.S. study, visits to relatives and friends are not included. Similarly, the sampling frame consists of the whole Dutch population, Although children under 15 have slightly fewer questions which may be answered by other household members if the children are too young to answer themselves.

The AIR survey takes place over the period of a week 2 or 3 times a year and deals only with air travel actually undertaken. One in five passengers is questioned verbally in the waiting lounge after check-in. In 1981, about 75,000 persons were interviewed in this way. Although transit passengers are included in the survey, they are not relevant to the current analysis.

Weighting and expansion of data

At the conclusion of every C.B.S. survey a comparison is made which estimates the quality of the sample. The distributions of age, geographical spread and level of urbanisation is compared for the initial sample, the responding sample and the official population statistics. In recent years the C.B.S. experts have considered that the variation between the responding sample and the official statistics is so small that weighting has been dispensed with.

The PANEL survey, in addition to replacing respondents from the total panel, weights the data according to age, sex, spatial distribution and size of the municipality, using official statistics.

In order to calculate the air trips of all Dutch travellers, the AIR survey uses official airport statistics to expand the 20% sample. Using the air travel survey, specific results, such as the ex-

panded holiday air trips made by persons living in the Netherlands, can be gained.

A Comparison of the Most Important Results.

Comparing results of different studies on the same theme is always a difficult task. Often something which, on the surface, appears to be readily comparable is found to be of limited comparability when closely examined - definitions and survey periods are slightly different, variables are reported in different categories, and so on. The comparison requires, therefore, very accurate research as well as the ability to recognise possibilities of creating compatability through calculation methods.

While the above comments can be applied fairly generally to any comparison, the current exercise was made more difficult by the fact that the surveys were all executed with very different methodologies. The review of some critical results will therefore include a discussion of the techniques used for comparison.

Since the AIR survey is most valuable as a benchmark for holiday air travel, the most important comparisons occur between the C.B.S. and the PANEL surveys. The most significant characteristics of the two studies are presented in Table 4. It should be noted that for the C.B.S. and PANEL studies, the reporting period is 1 October - 30 September, whereas for the AIR survey it is the calendar year.

Table 4. Comparison of Results of Holiday Travel
(4 nights or more)

	C.B.S.		PANEL		AIR
	1980	1981	1980	1981	1980
Travel Intensity	61.2%	63.0%	67.5%	65.0%	
Travel Frequency	1.37	1.36	1.44	1.46	-
Total Travel volume (per 1,000 pop.)	838	857	972	949	
Trips (in millions)	11.4	11.7	13.2	13.0	
Of these:					
- Internal Winter(1)	0.8	0.8	1.2	1.1	
- Internal Summer(2)	3.9	4.0	4.8	4.8	-
- External Winter	1.5	1.6	1.5	1.5	
- External Summer	5.3	5.3	5.7	5.6	
Trips by Air (in millions	1.08	0.99	0.86	0.97	1.44
Of these:					
- Winter	0.39	0.35	0.32	0.32	0.48
- Summer	0.69	0.64	0.54	0.65	0.96

(1) Winter 1.10 - 30.4; (2) Summer 1.5 - 30.9

A first comparison between the C.B.S. and PANEL surveys shows an approximately 9-10% lower travel volume from C.B.S. It is interesting to note the contrasting trends in travel intensity and frequency from 1980 to 1981. The absolute number of trips with external (non-Dutch) destinations is relatively constant between surveys, though the PANEL survey measured almost 20% more trips than did C.B.S.

Even assuming that the AIR survey results would be higher than those for the other two surveys, there were some remarkable results. In 1980, the only year for which AIR results were available for comparison, this survey produced the fairly astounding figure of 30% more trips. Perhaps even more surprising was the notable increase in the number of trips reported in the PANEL survey in 1981 compared with the decrease reported by C.B.S. These conflicting trends and the extent of the change, particularly in the summer flights, cast considerable doubt on the reliability of the data.

A Critical Evaluation of the Results with Special Reference to the Survey Method

General comments

As already outlined, the C.B.S. and PANEL studies measured the same factors and sometimes produced significantly different results. The basis of these differences will now be examined in detail using the analysis of the variables of travel intensity, travel frequency and the travel volumes (calculated using intensity and frequency) as examples.

At the outset it should be made clear that the differences do not lie in shoddy techniques, in the choice of the survey period, in the definition of holiday travel, or in the nature of the sample. The latter is, however, not true for the C.B.S. study since no weighting was done in recent years. In the PANEL survey, however, it can be assumed that, in the statistical sense, the sample presents a representative picture of the Dutch population.

The survey concept, however, definitely has an important effect on the results. C.B.S. carries out personal interviews each year on a new sample of respondents, compared to the PANEL survey which surveys the same people every 3 months, only replacing the wastage with new persons.

Methodological effects

The question of the methodological influences on the results of empirical surveys has generally been neglected - not only in travel research. This neglect is most apparent in panel surveys even though distortions are presumably much greater in these surveys than in others. Discussions about panels are usually limited to the best methods of dealing with attrition or wastage problems.

Even though relatively little is known about panel surveys, it is strongly suspected that distortions occur for many reasons other

than wastage or non-response, and it remains feasible that other important methodological effects of panel surveys will be discovered in the future. The following discussion must be understood in the light of these reservations.

Panel effects

In general, it appears that those persons interested in the subject matter remain in the panel longer than those for whom it is not interesting. In this case, those persons who make most holiday trips tend to remain throughout the life of the panel. Since replacement is based only on socio-demographic and regional criteria, the effect is a gradual increase in the number of persons in the panel who travel a lot. Correspondingly, travel intensity, and travel frequency in particular, tend to increase. This effect would, however, be weakened in the PANEL survey since the total panel from which replacements are taken is not a holiday-panel only, but representative of the whole population.

A further counter-effect (i.e. which decreases travel intensity and frequency) results from the increased knowledge of the questionnaire. Follow-up surveys have substantiated the hypothesis that households tend to fill out the questionnaires as simply as possible. In the PANEL survey, it is undoubtedly easiest to report no trips or as few as possible. On the other hand, it is feasible that a better knowledge of the instruments results in a better standard of completion.

The problem of withholding information is as valid for actual travel as it is for travel planned for the next 18 months. It can easily be speculated that PANEL participants "fear" that their anticipated holidays may not match their actual travel in the future. Since nobody is anxious to report "errors" in their planning, it is very likely that information on planned trips may be suppressed.

Written questionnaires

The use of a written survey together with the use of 3 month intervals to collect data in the PANEL study should produce a fairly exact reporting of travel behaviour. Since written surveys can be filled in at the respondent's leisure (with recourse to diaries, other family members' recall and so on), it can usually be assumed that they are answered fairly carefully. Participants in panels, with their knowledge of the survey theme, have the added advantage that they can take note of their relevant behaviour between surveys, making the filling out of the questionnaire even easier.

Weighting

Although it can be assumed that the original samples for both the C.B.S. and the PANEL surveys were representative, the responding sample for the C.B.S. survey was not weighted so that the degree of representativeness is therefore unknown. The decision not to make use of secondary data to weight the C.B.S. survey was made because

it was believed that variations from the whole population were not significant. It can be shown, however, that when the most recently available C.B.S. data (1977/78) were analysed, even though the variations were small, there was a significant influence on travel intensity and frequency. The rural areas in particular tended to be over-represented and the urban areas under-reported. Since urban residents traditionally make more holiday trips than rural dwellers, this may have resulted in only very minor under-representation of trips.

Non-response

Despite the above comments, it could be argued that the actual application of weighting factors which was done in the PANEL survey, and the checking for imbalances in the C.B.S. survey, did create sampling frames which were practically free from distortions. It remains feasible, however, that all persons who do not respond exhibit some particular holiday travel pattern. The probability that this is similar for a large proportion of non-respondents, as the German research showed, is therefore quite high.

An additional non-response bias causing under-reporting of trips could be expected in the C.B.S. survey. Since those who travel most are less frequently at home, they are harder to contact in a personal interview situation. The problem was reduced to some extent, however, since the interviewer was obliged to make 3 attempts (between 1 October and 15 December) to contact the respondents.

The effect (if any) and direction of non-response in the PANEL survey is much more difficult to estimate although the nature of the PANEL survey allows for more reliable estimates of non-response correction factors than do almost all other surveys.

The effect of memory limitations (Non-reported trips)

A further indisputable distortion is introduced by the limited memory of the respondents. Unfortunately forgetfulness is very human and it would be absurd to assume this does not occur in surveys. Relevant in this context is that, in principal, it is wiser not to make definitions too strict. For example, rather than including only trips longer than 5 days, shorter trips can also be included and later discarded during analysis. This reduces under-reporting on the basis of definitional uncertainty on the part of the respondent and possibly leads to better reporting of all actual trips at the same time.

The C.B.S. survey is very demanding in this respect. Respondents are expected to remember details of all holiday travel in the last 12 months. The problem is less one of remembering the details of a given trip than one of recalling whether in fact, one or more trips were actually made. The problem is exacerbated by a personal interview which gives the interviewee very little time to consider, and certainly no time to prepare for, the survey topic. (It should be reiterated that in both the PANEL and C.B.S. surveys, respondents had to report only on their own trips - unless they were reporting for a person less than 15 years of age).

The memory problem is usually reflected in good reporting of main holiday travel and a tendency to forget second or subsequent trips, particularly if they are made by car. Applying this principal to the C.B.S. results means that travel intensity would hardly be affected while travel frequency would have to be corrected upwards.

In the PANEL survey the memory lapses for normal holiday travel (i.e. for more than 4 nights) are not significant. This helps to clarify the noticeably higher travel frequency reported in the PANEL survey (Table 4).

A comparison of the absolute number of trips between the two surveys confirms the above conjectures. The external holiday travel remembered by the C.B.S. respondents compared with the PANEL respondents is only 3% less, whereas the domestic holiday travel reported is nearly 20% less. Since internal travel within the Netherlands comprises largely second and third holiday trips which are less important and more easily forgotten by the traveller, the direction of the discrepancies in results is plausible.

The AIR survey

Finally in this discussion of results and methodology, the AIR survey should be included. Since the total number of plane trips does not depend on the survey, but on the general passenger statistics, non-response and memory problems are not important in this context. Caution is, of course, necessary when not all trips but, as in this case, only holiday trips are analysed.

This means that because of the sampling system, non-response does, in fact, play a role here. As mentioned, one in five passengers were selected for survey. This selection technique has no problems as long as the interviewer has sufficient time to carry out the interview. With charter flights to holiday resorts this is usually the case. With normal flights, however, there is often very little time between check-in and boarding. The fact that experienced travellers - often on business travel - usually arrive later than less experienced travellers - many of whom are holiday travellers - can easily lead to a sampling problem. It is very probable, therefore, that holiday travellers are over-represented in comparison to business travellers.

That the over-reporting of holiday travel in the AIR survey is of such high proportions that the C.B.S. and PANEL surveys could be expected to reach this level with correction, is however, hardly imaginable. It is much more likely that, while the AIR survey has an over-representation of these trips, the other two surveys are under-represented and that the real value is somewhere in the middle.

The inclusion in the AIR survey sampling base, of all passengers, whether or not they are Dutch, probably also contributes to the differences in results in a minor way.

Summary

The above overview shows a series of distorting effects in the results of the 3 surveys. Sometimes the direction of the effects is clear, sometimes the effects are counterbalancing.

It is basically never possible to give a concise estimate of the degree of difference because the necessary control mechanisms are not usually available. The critical problem areas have, however, been highlighted in Table 5 where the factors and their general direction of influence have been broadly summarised. It can be seen that the C.B.S. survey has an overall tendency of under-reporting while the PANEL survey has influences in both directions which may possibly balance. Holiday travel is generally over-reported in the AIR survey.

Table 5. An Indication of the Direction of Various Factors on the Survey Results

	C.B.S.		PANEL		AIR	
	Travel Intensity	Travel Frequency	Travel Intensity	Travel Frequency	Travel Intensity	Travel Frequency
. Sample	(-)	(-)	o	o	+	+
. Written/ Oral	(-)	-	o	o	o	o
. Non-Response	(-)	-	(+/-)	(+/-)	(+)	(+)
. Memory	(-)	-	o	o	o	o
. Panel Effects			+/-	+/-		

Legend: o Probably no influence
+ Probable over-reporting
- Probable under-reporting
( ) Probably only small influence

THE NECESSITY FOR VALIDATING TRAVEL SURVEY DATA

The parallel results exhibited by the examples from the Federal Republic of Germany and the Netherlands highlight the importance of validating travel survey data.

All six surveys collected empirical data on people's travel behaviour. But empirical data are always raw data. Raw, in the sense that they reflect what the researcher asked, what the interviewer wrote down, what the coder entered. If all these stages were executed without error, each survey would produce "correct" results. The label "correct" however, does not say anything about the validity of the results. Validity implies that the phenomenon actually measured is that which was intended to be measured. In the present case that phenomenon was the actual holiday travel behaviour and not, for example, that which was reproduced through the respondents' recollections.

The problem is not that the data deviate from reality, but that, in all but one case, no attempts were made to recognise and label an important influence on the data - that of systematic errors. These are the errors of non-response and memory limitations which have been described; errors which have been shown here and elsewhere (Brög and Meyburg, 1981a & b; Brög, Erl et.al, 1982) to critically affect survey results. Instead, documentation of statistical values of representativeness was used to suggest to the methodologically unsophisticated user of the data a level of accuracy that the user would invariably mistake for the degree of validity.

Correction of all travel survey data must therefore be seen as an integral part of any survey methodology if the survey aims to produce valid, usable data. The survey is not, therefore, concluded with collection of data but it is concluded with correction of data.

REFERENCES

Brög, W. (1979) Mobility and Lifestyle - Sociological Aspects. Prepared for 8th Int. Symposium on Theory and Practice in Transport Economics, Istanbul, Turkey (September).

Brög, W., Erl, E., Meyburg, A.H., & Wermuth, M.J (1982), Problems of Non-Reported Trips in Surveys of Non-Home Activity Patterns, Trans. Res. Rec. (to appear).

Brög, W. & Blechinger W. (1982), Analyse der Untersuchungsmethoden zum niederlandischen Urlaubsreiseverkehr (Analysis of the Survey Methods of Holiday Travel in the Netherlands) Final Report, Munich.

Brög, W. & Meyburg, A.H (1981a), The non-response Problem in Travel Surveys - An Empirical Investigation, Trans.Res. Rec. 775, pp. 34-38.

Brög, W. & Meyburg, A.H. (1981b), COnsideration of Non-Response Effects on Large-Scale Mobility Surveys, Trans. Res. Rec. 807, pp. 39-46.

Brög, W. & Meyburg, A.H. (1982), Influence of Survey Methods on the Results of Representative Travel Surveys, Transpn Res-A. Vol. 16A.

Centraal Bureau vor de Statistiek (C.B.S.) (1980-81), Vakantie-Oderzoek (Holiday Survey), The Hague, The Netherlands.

German Federal Statistics Office FSO (Statistisches Bundesamt) (1979) Mikrozensus, Bonn, West Germany.

Ministerie van Verkeer en Waterstaat (1980-81), Air Travel Survey (AIR), The Hague, The Netherlands.

Moolman, B.A., (1979) Eine neue Betrachtung der nicht-zufälligen Fehler in der Verkehrserhebungsforschung (A New View of Non-Random Errors in Travel Survey Research), Presented at the 5th Workshop of the German Transport Science Society, West Germany (November).

Nederlands research instituut voor Rekreatie en Toerisme and Institut voor sociaal-psychologisch Onerzoek en Marktanalyse, (1980-81), Kontinue Vakantie Onderzoek (Continuous Holiday Survey (PANEL).

Socialdata, Social Science Research Institute (1981) Marktanalyse des Verhaltens im Personenfernverkehr (Market Analysis of Intercity Travel Behaviour). Final Report, Munich.

Study Group for Tourism (Studienkreis für Tourismus e.V.) (1980) Urlaubsreisen 1979, Ergebnisse der Reiseanalyse (Holiday travel 1979, Results of the Travel Analysis). Summary, Starnberg, West Germany.