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SPECIFIC EXPERIMENTAL TRIALS VERSUS LARGE-SCALE MOBILITY SURVEYS INSETS TO INVESTIGATE TRANSPORT-RELATED BEHAVIOURAL ISSUES: THE CASE OF THE PRIMARY UTILITY OF TRAVEL

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ABSTRACT

Travel is traditionally considered as an entirely derived demand motivated solely by the activity performed at destination. Nevertheless some works have already pointed out that travel can have some utility in itself, and even travelling for its own sake can be one genuine purpose. To better investigate this issue of the primary utility of travel, this paper examines two surveys recently implemented in France in order to capture empirical data on the matter: an exploratory survey involving the staff working at the French National Institute for Transport and Safety Research, and specific questions in the large scale French National Travel Survey (FNTS). It is evident that these are two radically different methodologies that can be used to investigate any travel behavioural issue, each one having its benefits and shortcomings, but possibly presenting complementarities and synergies. The general objective of the paper is then to compare and to contrast the opportunities and the challenges that these different survey instruments present when investigating the primary utility issue. In order to fulfil this comparison, the two survey instruments are described, stressing the innovations introduced to obtain the relevant data. Then, the comparison between both survey instruments is conducted following four facets: objectives, implementation, dimensions of the primary utility construct, expected results. Some results concerning the influence of gender, age and main transport mode used for the trip under investigation on the FNTS variables related to the primary utility construct are finally offered.

INTRODUCTION AND STATE OF THE ART

The demand for travel is traditionally considered as entirely derived, since moving from one place to another is necessary to perform activities at different locations. However a few theoretical or empirical investigations point out the evidence of the intrinsic utility of travel (Hupkes, 1982; Marchetti, 1994; Mokhtarian et al., 2001), that varies among trips, from zero for trips exclusively done to reach the destination, to the whole of the trip utility for trips entirely for their own sake, with most of trips in-between, when some degree of satisfaction is coming from the travel activity itself. The existence of such a phenomenon would have major consequences in transport modelling practices, from travel demand estimation techniques to the study of the modal choice of individuals, which explains some recent research efforts (Mokhtarian, 2005) in better investigating an issue that could seem a rather academic question at the outset.

The necessity of collecting specific data to better study the primary utility is apparent, since the relevant information that can be gathered from standard nationwide or local mobility surveys or other possible ready-to-use data sources (census data, consumer expenditure surveys, panel data on car use etc.) can at best provide only some partial insights into the matter. Travel behaviour research is often confronted with similar needs, and usually the outcome is to set up a targeted survey to gather the data that are needed. For example, considering our research topic, Mokhtarian and Salomon (2001) describe the results of an attitudinal mail survey sent to the dwellers of three neighbourhoods in the San Francisco Bay area, that allowed the authors to empirically study this issue. Richardson (2003) uses an adaptive stated preferences experiment to identify travellers in Singapore whose value of time is zero, a result that can be seen as an indicator of the existence of a primary utility for the trip under consideration.

On the other hand, another way of collecting data on the primary utility, as well on any other travel behaviour-related phenomenon, can be envisaged. In most countries, at least in the Western Hemisphere, several kinds of mobility surveys are periodically made. The “traditional” purpose of these surveys is to feed the transport models that are run at different scales (national, regional, metropolitan) and that ideally constitute the backbone of any planning activity. However at least two main driving forces are pushing to an evolution of such a framework.

First of all, running a survey on a sample that is statistically representative of a large territory requires a strong mobilisation of financial and technical resources, that need to face increasing public budgets constraints. It is hence mandatory to maximise synergies and raise the awareness and the interest of different public and private bodies, beyond the transport planning authorities that are usually primarily involved in such an activity. This can allow to fundraise from different sources: on the other hand, disparate entities such as transport services operators, local authorities, car manufacturers or insurance companies will have different priorities concerning the kind of data that ought to be collected.

Secondly, transport systems in modern societies have to meet higher and higher expectations concerning their economic, environmental and social performances, and this pushes transport

decision makers and practitioners to look for a wide range of different actions to regulate the system itself. The issue is not any more to serve ever-rising traffic flows through the infrastructure and transport offer development, but to set up more ambitious goals allowing to manage also the demand for transport. This in turn needs a wide range of information pertaining to several different disciplines beyond classical transport planning, in order to understand whether the stated policy objectives can be achieved or have been achieved.

These two elements are propelling an evolution of the “classical” mobility survey, in order to integrate other data sources (primarily the census data) or accommodate the data requirements of planning processes at different territorial scales (such as the “add-on” of the latest U.S. National Household Travel Survey of 2001). Another compelling necessity is to take the opportunity of a mobility survey to collect also other kinds of data, mainly related to attitudes, opinions and beliefs (see for example CERTU, 1998 concerning the last part of the mobility surveys that are customarily administered in French cities). This can help in having better insights in the mobility of individuals and of goods, allowing decision makers to implement a wide range of interventions.

In view of the above, it becomes pertinent to think about designing specific “insets” within a large-scale mobility survey to investigate new topics such as the primary utility. Of course a great care must be used to respect the strict budgets in terms of cognitive burden for the respondent on the one hand, and nevertheless to obtain sufficient data to study rather complex phenomena on the other, and more research is probably needed in this point to improve the state of the art. The present study represents a first step in this direction, since it shows how a travel-related behavioural phenomenon such as the primary utility of travel can be studied through two radically different survey instruments. The outcome of the whole process would then be the definition of a measurement technique on the basis of the gathered data. Up to now, this result has been achieved exclusively concerning the specific experimental trial that will be presented in the following section. The interested reader is referred to the Diana (2008) paper concerning this aspect, whereas the present paper deals almost exclusively with survey-related issues.

SCOPE OF THIS PAPER

On the basis of the framework that has been described in the previous section, two surveys have been recently implemented in France to deal with the primary utility issue: an exploratory survey involving the staff working at INRETS (The French National Institute for Transport and Safety Research), hereafter called “INRETS survey”, and specific questions in the large scale French National Travel Survey (FNFS). It is evident that these are two radically different methodologies that can be used to investigate any travel behavioural issue, each one having its benefits and shortcomings, but possibly presenting complementarities and synergies. The general objective of the proposed paper is then to compare and to contrast the opportunities and the challenges that these different survey instruments present when investigating the primary utility issue.

In order to fulfil this comparison, the next two sections will describe respectively the two survey instruments. The description of the INRETS survey will stress the innovations introduced at this occasion, on the one hand as regards the new concepts investigated, and on the other hand as far as the attractive web-based user-intuitive implementation design is concerned. The featured outcomes will point out questions on which further investigations would be welcome. From this experience, the inclusion of primary utility questions into the FNTS will be reported, and the variables linked to this issue in other parts of the questionnaire will be detailed.

From there, the methodology will follow a three-fold comparison between both survey instruments. Each facet of the comparison will be the focus of a specific section. First, the comparison as regards the objectives and the implementation of the surveys will be minutely discriminated. In spite of apparently irreconcilable differences, the two matches will prove the feasibility of the exercise. Second, six dimensions of the primary utility construct that can be derived from the INRETS survey will be defined, and a table will thoroughly analyse which variables extracted from the FNTS can yield a similar information for these six dimensions. Third, the last section will elaborate on which results from the FNTS can be expected to fit the lessons from the INRETS survey. These resolutions will have to be developed in forthcoming research, which the conclusions will sketch.

THE INRETS EXPLORATORY ATTITUDINAL TRAVEL SURVEY

The INRETS exploratory attitudinal web-based travel survey was administered at the end of 2004 and allowed for the quantitative study of the intrinsic utility of a set of trips reported by INRETS workers from all the different seats of the Institute, located in the suburban areas of Paris, Lyon and Lille (with smaller teams working also in other cities). Data were collected about attitudes, opinions, beliefs and tastes of respondents with reference to a specific trip they made. This latter was randomly selected by the computer among the trips that were made the working day before the interview, as they were reported by the respondent in the introductory part of the questionnaire. Semantic scales with 11 points were used for the attitudinal questions. The number of considered points is higher than usual, but more points can be used when the respondent is familiar with the subject (Chang, 1994). In our case, workers in a transport research institute had to answer to questions related to a trip they have made, so that such requirement should largely be met. Another concern related to longer scales is the increased respondent burden. However, in our questionnaire, cursors could be dragged on a ruler by using the computer mouse and semantic scales were identified by smileys or other graphical interfaces. We report two examples of questionnaire screens in figures 1 and 2 respectively to give an idea of the graphical layout that has been used. We see from these figures that the respondent could simply choose a position on the ruler just considering it as a continuum. Hopefully this design can effectively limit the respondent burden. Moreover, we point out that most of the questions there displayed are related to measurement items of the primary utility construct. We list all those relevant questions in table 1, together with the socioeconomic characteristics of the individual that are relevant to the primary utility concept as well.

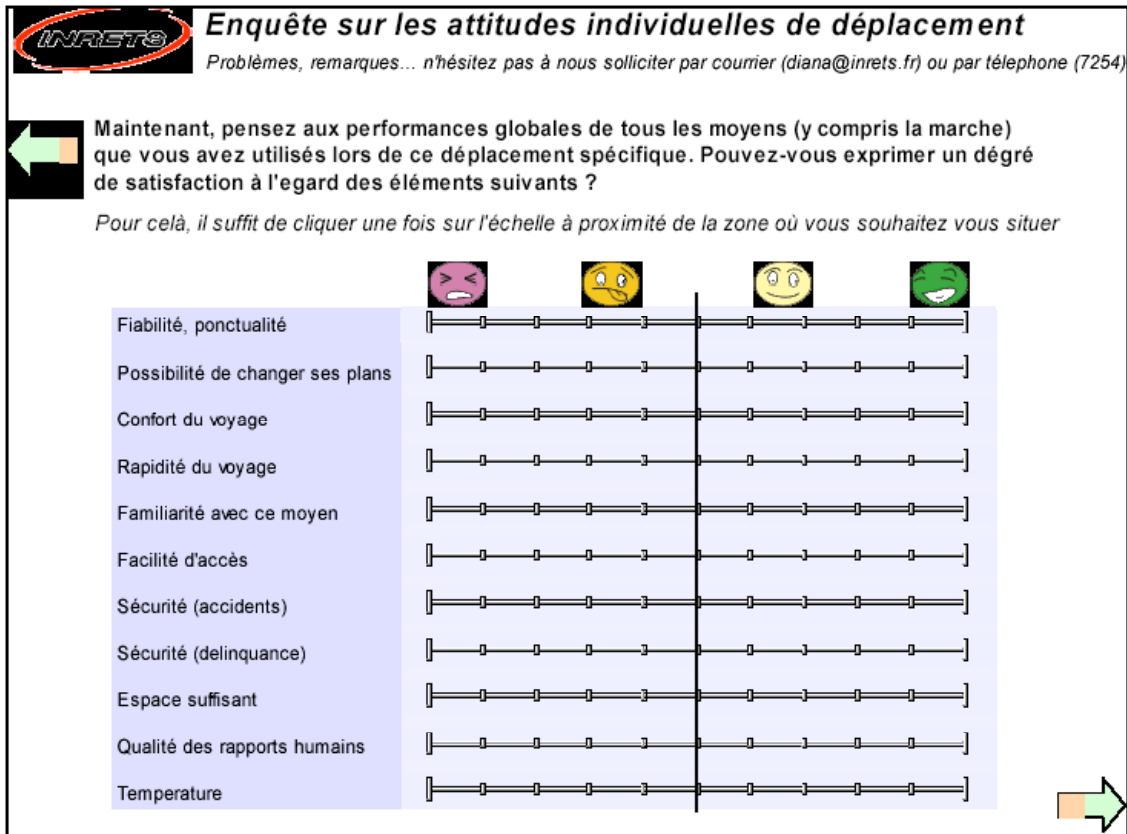


Figure 1. Semantic scales on the performances of the transport mode used during trip

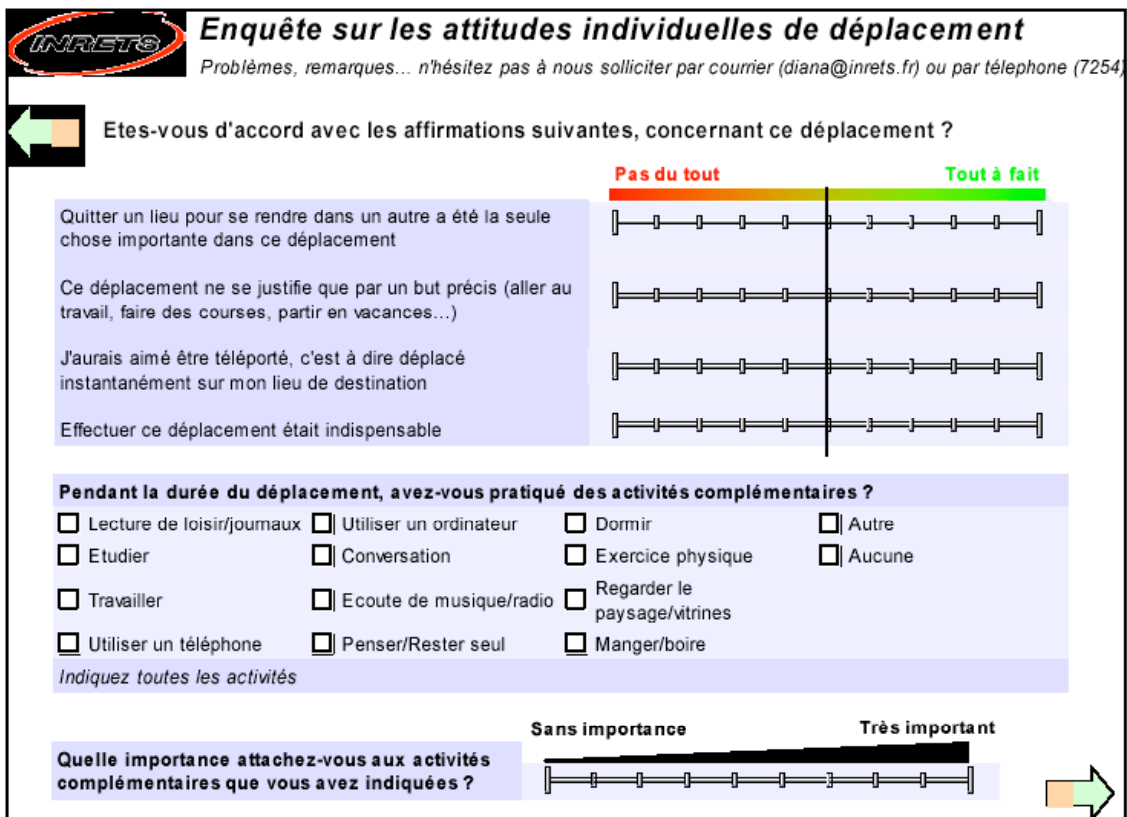


Figure 2. Semantic scales on trip-related statements (top) and on the importance of the activities performed while travelling (bottom)

The interested reader is referred to (Diana, 2005 and 2006) for a complete description of the survey instrument. The variables for the study of the primary utility that were selected from the list that is show in table 1 are presented later in this paper, when we discuss the dimensions pertaining to this construct. 164 responses were gathered, with an estimated response rate between 25% and 35%, according to the number of valid E-mail addresses that have been contacted. This figure cannot be known with precision, since temporary workers and students that left INRETS are not immediately dropped out of the roster.

Table 1: Questions in the INRETS survey potentially related to the primary utility

VARIABLE NAME	QUESTION	MEASURE
<i>Variables related to the trip under investigation</i>		
102 RELIABILITY	Reliability of the transport means	11 points bipolar scales shown in figure 1 (smileys are used as labels)
103 FLEXIBILITY	Possibility of schedule adjustments	
104 COMFORT	Comfort during the trip	
105 RAPIDITY	Sensation of travelling fast	
106 FAMILIARITY	Sensation of familiarity with the transp. means	
107 ACCES	Easily accessible transport means	
108 SECURITY	Safety concerning accidents	
109 CRIME	Safety concerning crime	
110 SPACE	Enough space onboard	
111 OTHERS	Nice human interactions	
112 TEMPERAT	Right temperature	
113 AIR	Good air quality	
114 NOISE	Absence of noise	
115 PATH	Nice route followed by the means	
116 STRESS	Absence of fatigue and stress	
117 TRAFFIC_JAM	Absence of traffic jams	
120 CONNECTION	Good connection between transport means	11 points bipolar scales shown in figure 2 (top)
122 WAIT_LENGTH	Short waiting time at the connection	
149 DEST_IMPORT	Importance of reaching the destination	10 points scale, from "Negligible" to "Enormous"
150 TRIP_NECESS	Necessity of making the trip	
151 PURPOSE_IMP	Importance of the trip purpose	
166 TELEPORT	Willingness to being teleported	
154 FASTER	Time gain when using a faster means	Multiple answers, 17 categories
155 CHEAPER	Money saving when using a cheaper means	
158 PAST_MEANS	Means used in the past for the same trip	11 points bipolar scales, from "Totally the contrary" to "Absolutely agree"
160 FREEDOM	Sensation of freedom	
161 SPEED	Sensation of speed	
162 NO_WASTE	Sensation of not wasting time	
163 LANDSCAPE	Good relationship with the surroundings	
164 NATURE	Harmony with nature	
165 WELLBEING	Sensation of well-being	
167 ACTIV_TYPE	Kind of activity performed while travelling	Multiple answers, 14 categories

Table 1: Questions in the INRETS survey potentially related to the primary utility (continued)

VARIABLE NAME	QUESTION	MEASURE
<i>Variables related to the trip under investigation</i>		
168 ACTIV_IMP	Import. of the activities done when travelling	10 points scale shown in figure 2 (bottom)
169 DETOUR 170 EXPLORE 171 ITINERARY 172 SAKE_OF_IT 173 LENGTHENING 174 RELAX 175 FAR_DESTIN 176 NO_PURPOSE 177 IDEAS 178 ALONE 179 FUN 180 SHOW 182 TRIP_LIKING	Detour to enjoy a better environment Travelling to explore new places Unusual itinerary to reach a known destination Travelling just for the sake of it Longer trip to better know the surroundings Travelling just for relax Destination farther off than necessary Trip without a well defined purpose Travelling to organize ideas Travelling to be alone Travelling for fun Trip to show off a transport means Overall trip liking	11 points bipolar scales shown in figure 2 (top), ranging from “Not at all” to “Absolutely yes”
184 DESIR_TIME 185 DESIR_DIST	Desired trip length in minutes Desired trip length in kilometres	Metric measures
<i>Variables related to the use of different transport means</i>		
126-138 FREQ_[m]	Frequency of use of [transport means]	5 points ordinal scale from “More than 3 times a week” to “Seldom or never”
213-226 QUAN_[m]	Quantity of trips made using [transport means]	10 points scales, from “Not at all” to “Very much”
238-251 TREND_[m]	Sought intensity of use of [transport means] in the future	11 points bipolar scales, from “Much less” to “Much more”
<i>Socioeconomic characteristics of the interviewee</i>		
252 SEX	Gender	Male/Female
253 AGE	Age	Metric measure
255. JOB	Occupational status	Categorical (13 categories)
264 INCOME	Income bracket	Ordinal (10 categories)
266 LICENCE	Driving licence possession	Yes/No
267 CARS	Number of available cars in the household	Metric measure

THE FRENCH NATIONAL TRAVEL SURVEY OPPORTUNITY

These promising preliminary findings prompted us to organize a larger scale experiment, in order to assess to what extent they are generalisable and to perform analyses at a more

disaggregate level to deepen our understanding of the phenomenon. A good occasion to apply these is the French National Travel Survey (FNTS) in 2007. Once per decade, the Ministry of Transport and the National Institute of Statistics conduct a National Household Travel Survey with the scientific support of INRETS. It is the data source providing the most transverse and consistent overview of mobility, whatever the modes and the transport situations of people living in France may be. The 2007-2008 one has started on the 1st May 2007. The aim of these surveys is the description of short and long distance trips made by households living in France, as well as their access to and use of public and private transport means. Figure 3 gives an overview of FNTS 2007-2008.

The revision of the questionnaire has been a chance to introduce innovations about social matters: a biographic survey and questions about the primary utility of travel. The survey is organized around the three following topics:

- Description of trips;
- Vehicle ownership and use;
- Accessibility to public transport.

Six survey instruments are used:

- 1) During the first visit a CAPI questionnaire is designed to collect at household level (including household members) the socio-demographic variables, characteristics of commuting trips to work, school or kindergarten; driving licences and car use, traffic accidents; season tickets and discounts in public transport; description of vehicles available in the household and the housing environment;
- 2) A seven-days vehicle diary is attributed to one of the household's vehicles (selected with unequal probability distribution to give more chance to be drawn to motor two wheelers, which are particularly interesting on the point of view of road safety) to be filled by the vehicle users;
- 3) During the second visit, an individual above 6 years old called "Kish", selected with unequal probability distribution giving more chance to highly mobile persons, is asked to describe her/his long distance trips made during the last three months (as recalled from memory);
- 4) The same "Kish" person also describes her/his trips made one weekday before the interview, and one weekend day (either Saturday or Sunday);
- 5) A sub-sample of approximately 1000 individuals fill a biographical grid in order to describe the transport means used throughout their whole past life;
- 6) A sub-sample of approximately 1500 volunteers are given a GPS receiver.

The sample size is approximately 17,000 responding households (including 5 regional additions). Data collection is spread over six waves covering 12 months, in order to neutralize the seasonal variations which affects mobility (especially for long distance travel). Taking into account the overall length of the interviews (approximately a total of 130 minutes), the data are collected in two visits.

The new primary utility inset is included after the description of trips by the "Kish" person in the fourth instrument, and the questions are asked for selected trips, both for weekdays and

weekend days. The development of this inset was a long process, that is described for curious readers in appendix 1.

Protocol of the French 2007 NTS

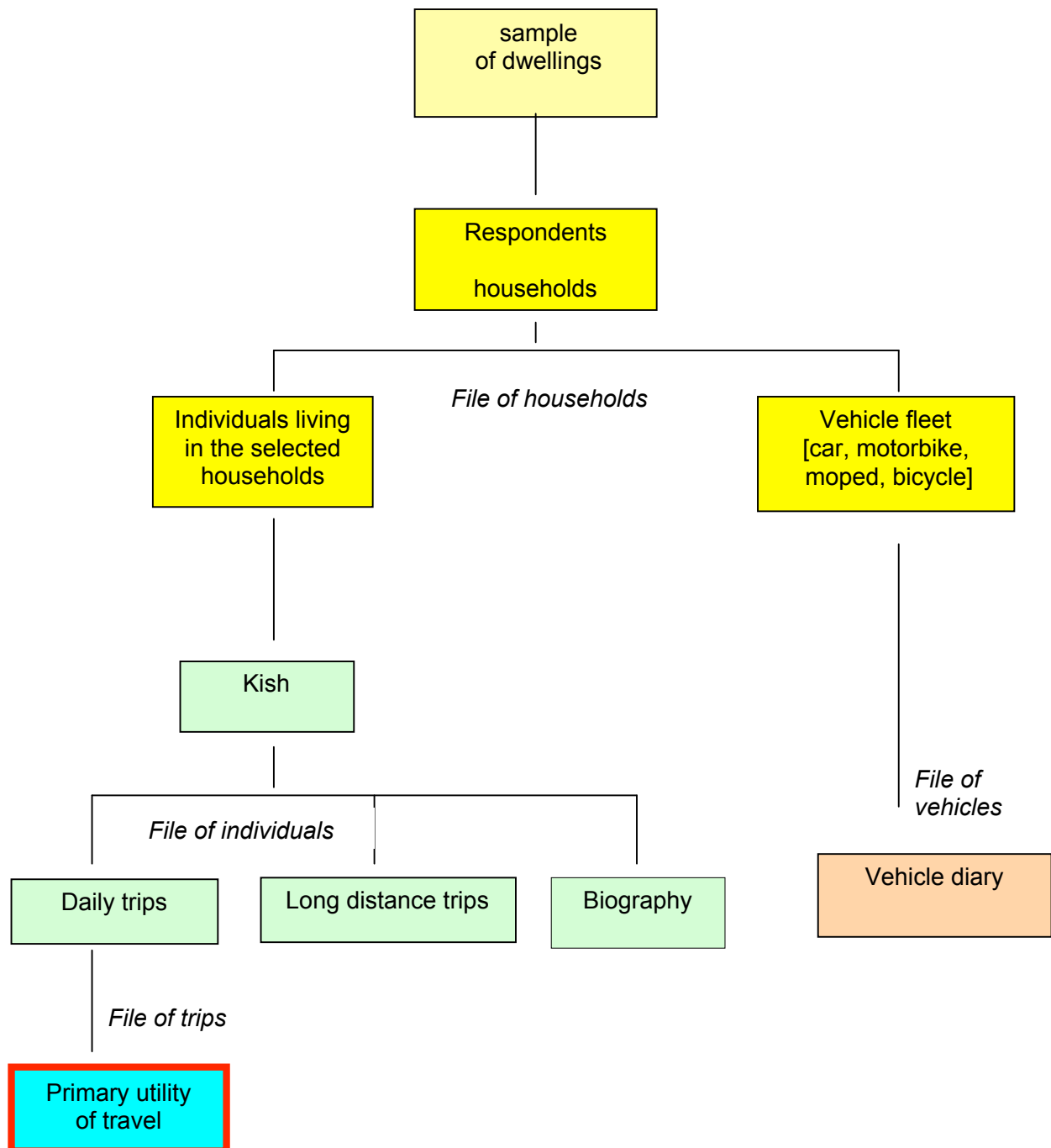


Figure 3: Architecture of the French National Travel Survey 2007-08

Apart from the primary utility inset, a number of questions in various parts of the questionnaire bring information that is relevant for the study of primary utility. The primary utility inset describes some key primary utility aspects for one random trip of the Kish individual, but for this trip other important characteristics are available from the general

description of trips. Besides, all household members (including Kish) provide a broad overview of regular trips, and notably alternatives that might be linked to the intrinsic value of the trip. Moreover, general household characteristics, Kish individual's characteristics, and more particularly questions about her/his access and health limitations to mobility as well as experience and liking of travel modes are available in other parts of the survey. Table 2 resumes these variables of interest for the primary utility issue. If we compare this table with the analogous table 1, that reports the same information for the INRETS survey, we notice that while the number variables pertaining to the primary utility of the trip under investigation has been radically reduced, much more information is available from other parts of the survey. Such information is related to the interviewee more than to the specific trip but it is nevertheless relevant for the study of the primary utility.

Table 2: Selected questions in FNTS potentially related to the primary utility

VARIABLE NAME	QUESTION	MEASURE
<i>Primary utility inset (for one random weekday or weekend trip)</i>		
MUACTI	With activity other than travelling	Yes/no
MUACTIVITE	Which activity carried out during trip	Up to 3 answers in a list of 10
MUACTIVAUT	Other activity carried out during trip	Open answer
MUINCIDENT	Whether with incident	No/yes
MUQUELINCIDENT	Which incident	Up to 3 answers in a list of 8
MUQUELINCIDAUT	Other incident	Open answer
MUSENSATION	Pleasantness of trip	3 items
MUFATIGUE	Tiredness of trip	4 items
<u>MURAIISON</u>	<u>Main reason for travelling</u>	<u>3 items:</u>
	The only important thing in this trip was to get from one place to another	
	Activities during trip were important for me	
	Feelings during trip were important for me	
<i>Other relevant trip characteristics (for all weekday or weekend trips)</i>		
MORIHDEP	Departure time	Metric measure
MDESHARR–MORIHDEP	Travel time	Metric measure
MHARRETA	Arrived early/on time/late	3 items
<u>MMOTIFDES</u>	<u>Purpose at destination</u>	<u>Pre-coded list</u>
	<i>Including: 7.76 Practising sport</i>	
	<i>7.77 Walk/ride/drive without precise destination</i>	
	<i>7.78 Going to a place of promenade</i>	
MMOY1S	First travel means	Pre-coded list
MMOYPRINC=MAX(MMOY1S, MMOY2S, MMOY3S, MMOY4S)	Main travel means	Pre-coded list
MNBMOD	Number of travel means	Number
MDISTTOT	Total distance	Metric measure
MTEMPSMAP	Walking time	Metric measure
MTPSATTENT	Waiting time	Metric measure
MTC1COND	Seated in public transport	5 items
MKMAUTORB	Travelled on expressway	Yes/no
MACCOMPID	Travelled accompanied	Yes/no

Table 2: Selected questions in FNTS potentially related to the primary utility (continued)

VARIABLE NAME	QUESTION	MEASURE
<i>Regular trip alternatives (for regular trips of all household members)</i>		
BTRAVAUTRMOY1S	Possible other means for same trip	Pre-coded list
BTRAVCHANG1S	Past other means used for same trip	Pre-coded list
<i>Household characteristics</i>		
TRANCHRE	Income group	Pre-coded list
JNBVEH+JNBCCVUL	Cars and vans	Number
JUTILMOTO	Motorcycles used	Number
JUTILCYCLO	Mopeds used	Number
JUTILVELOAD	Adult bicycles used	Number
<i>Kish's general characteristics</i>		
ANAIS	Age	Year
SEXE	Gender	2 items
SITUA	Activity	Pre-coded list
<i>Kish's travel experience and tools</i>		
ETC	Rode public transport	Yes/no
ETRAIN	Rode train	Yes/no
EAVION	Rode plane	Yes/no
EVACANCES	Had vacations	Yes/no
ESPORT	Practises sport	Yes/no
EMAP	Walks health recommended level	Yes/no
GPERMIS	Car licence	Yes/no
GCONDAUTO	Drives car	3 items
GAIMCONDAUTO	Likes driving car	3 items
GPERMIS2R	Motorcycle licence	Yes/no
GCONDMOTO	Drives motorcycle	3 items
GAIMCONMOTO	Likes driving motorcycle	3 items
GCONDCYCLO	Drives moped	3 items
GAIMCONCYCLO	Likes driving moped	3 items
GCONDVELO	Rides bicycle	3 items
GAIMCONVELO	Likes riding bicycle	3 items
ICARTABON	Public transport pass	Yes/no
GAGENE	Hindered in travelling	4 items
MQ1G	General health	5 items
MVELOQUAND	Last time bicycling	7 items

COMPARISON OF THE OBJECTIVES AND IMPLEMENTATION OF THE SURVEYS

The objectives of the surveys were radically different. The INRETS survey was an on purpose survey dedicated to the exploration of the primary utility concept through manifold subjective travel attribute appreciations by respondents. The FNTS is a general survey, covering all transport issues in France, aimed at giving an overall picture, and restricted to factual data about actual travel behaviour. We shall analyse whether these differences may impact and jeopardize the prospect of a comparison between those surveys.

The initiative of the INRETS survey must be credited to one researcher, co-author of this paper, Marco Diana, at that time post-doc at INRETS. On the contrary, the initiative of the FNTS is due to many stakeholders (about 20 funding organisations), with numerous interests in the area: ministry departments, as regards their scope of competence, government agencies, regions and local communities, transport operators, rail and car manufacturers, and INRETS. It is a much more complex management structure. As a result, the INRETS survey could include whatever questions seemed relevant for the study of the primary utility of travel, whereas in the FNTS a trade-off with other objectives and other organisations meant that the final questions on the primary utility of travel were not exactly the preferred ones.

There are major differences between the two surveys, so that it might be somewhat pretentious to draft a comparison. Nevertheless these differences are on a higher level of handling the survey and making it fit with organisational frameworks. The positive point is that the detailed design of both surveys were mastered by the same team at INRETS, making it easier to expect comparable data. In fact, the underlying objectives of the FNTS primary utility inset do not differ from those of the INRETS survey, even though objectives at a higher level might diverge.

Table 3: Comparison of the survey objectives and implementation

Items	INRETS survey	FNTS inset
Administration	Researcher only	INSEE (National Institute of Statistics), with control by SESP (an office of the Transport Ministry) and scientific coordination by INRETS
Periodicity	Once, on purpose	Regular (once per decade, 14 years)
Outcome	Research on travel behaviour	General database on transport and travel in France
Scope of data	Attitudes, opinions and beliefs	Many fields relative to transport and travel
Type of data	Both factual and subjective	Factual
Survey mode	Web	CAPI
Number of respondents	164	17000
Geographical area	Four INRETS sites	All France mainland
Sociological basis	INRETS employees	All persons aged 6 and over
Period under review	Two weeks in November 2004	One year May 2007-April 2008
Length of the survey	20-30 minutes	130 minutes in two visits
Type of answers	Web programmed buttons and mobile scales	Pre-coded CAPI cards
Personal variables	Entirely designed on purpose	Already asked in other parts of the questionnaire

Finally, apart the small primary utility inset, many other questions are asked in the FNTS. These questions can be used for studying the primary utility behaviour across many characteristics of the household, of the respondent, of the trip and so on. As far as the INRETS survey is concerned, all the needed personal description has to be specifically asked in a part of the questionnaire, leaving less scope for comparing attitudes, opinions and beliefs against remote features that are present in the FNTS. Table 3 sums up the comparison.

These differences are so huge that the comparison is a rather trivial exercise. Nevertheless, some of the differences may compensate in some way, weaknesses in some aspects being offset by strengths in other areas. The limited sample size, geographical and sociological representation of the INRETS survey, that is to say the length of the data file, is balanced by much richer dimensions available as far as primary utility variables are concerned, that is to say the width of the data file. On the other hand, the FNTS survey counteract the limited data on the primary utility of travel per se by numerous data on other aspects linked with transport. These compensations may yield a similar amount of data in the considered issue, so that it should be possible to compare appropriate dimensions brought by the two surveys.

COMPARISON OF THE CONSTRUCT DIMENSIONS

In the following, we explore the dimensions of the primary utility construct as they are defined in Diana (2008), and we present a comparative table of variables related to those dimensions in both surveys. This will give a picture of the contribution that each survey can give towards the identification of the travel behavioural phenomenon under investigation, hence allowing to see whether a similar primary utility notion can be defined and used for comparing the results. The primary utility dimensions that we considered in the INRETS survey are the following six:

1. the perceived importance of the activities performed while travelling, such as chatting, reading, or sightseeing;
2. the presence of implicit trip motivations, beyond the necessity of leaving a place to reach another one;
3. the existence of positive trip-related feelings, such as freedom and well-being;
4. the assessment of the desired length of the trip under investigation (the longer the desired length, the greater the primary utility should be);
5. the assessment of the transport means performances (e.g. the rapidity, the comfort or the reliability);
6. the importance of the activities performed at various locations, as an indirect measure of the utility of the trip itself.

Each of the above dimensions needs to be assessed through several measurement items, that correspond to a subset of the questions listed in Table 1. The process of selecting such subset within the INRETS survey in order to have a practically manageable measurement model is detailed in Diana (2008). Considering the large-scale survey, the total number of questions that would be needed even after such preliminary selection largely exceeds the reasonable maximum length of the FNTS primary utility inset, as it has been earlier described. On the

other hand, it is possible to retrieve information that can be of help in defining the above listed construct from other sections of that longer questionnaire (see table 2).

It is hence possible to present in the following table 4 two lists of variables that are in the FNTS and in the INRETS dataset respectively, that correspond to the relevant parts of the two questionnaires that have been previously presented. The variables on the same row have either the same semantic definition (but occasionally they are measured in a different way) or can be in any case compared through some simplifying assumption (for example, the transport mode liking can be compared with the subjectively perceived level of use of the mode and with the desire to increase or to decrease the use of that mode). Further pushing such comparison, responses to some FNTS categorical variables with n categories, such as MUQUELINCID (that identifies the kind of mishap that has eventually been experienced) can be seen as n distinct binary (Yes/No) variables, each one to be compared to a corresponding INRETS semantic scale.

Table 4 : Comparison of the survey variables

<i>FNTS variable</i>	<i>INRETS variable</i>	<i>Variable description</i>	<i>Con- cept</i>	<i>Dimen- sion</i>
2.1.1 BTRAVAUTRMOY1\$ 2.1.1 BTRAVCHANG1S	158 PAST_MEANS	Other means used for the same trip	<i>Multi- moda- lity</i>	(none)
3.3.2 GAIMCONDAUTO	217 QUAN_CONDUCT 242 TREND_CONDUCT	Car driving liking	<i>Trans- port means liking</i>	(none)
3.3.3 GCONDMOTO	216 QUAN_MOTO 241 TREND_MOTO	Motorbike liking		
3.3.3 GCONDICYCLO	216 QUAN_MOTO 241 TREND_MOTO	Moped liking		
3.3.3 GCONDVELO	215 QUAN_VELO 240 TREND_VELO	Bicycle liking		
6.2.2 MHARRETA	162 NO_WASTE	Trip length expectation / good time use	<i>Trip liking</i>	3, 4
6.4 MUSENSATION	182 TRIP_LIKING	Trip liking		
6.4 MUACTIVITE	167 ACTIV_TYPE	Activities performed during the trip	<i>Trip activi- ties</i>	1
6.4 MURAISON = 2	168 ACTIV_IMP	Importance of the on- trip activities		

Table 4 : Comparison of the survey variables (continued)

<i>FNTS variable</i>	<i>INRETS variable</i>	<i>Variable description</i>	<i>Con- cept</i>	<i>Dimen- sion</i>	
6.4 MUQUELINCID = 1,3,8	102 RELIABILITY	Reliability of means			
6.4 MUQUELINCID = 1,2,3,8	105 RAPIDITY	Rapidity of means			
6.4 MUQUELINCID = 5,6,7	108 SECURITY	Safety			
6.4 MUQUELINCID = 4	109 CRIME	Crime	<i>Trip</i>		
6.4 MUQUELINCID = 4,7	111 OTHERS	Human relationships	<i>perfor-</i>	5	
6.4 MUQUELINCID = 1,2,3,8	117 TRAFFIC_JAM	Trip smoothness	<i>man-</i>		
6.4 MUQUELINCID = 8	120 CONNECTION	Quality of connection	<i>ces</i>		
6.4 MUQUELINCID = 8	122 WAIT_LENGTH	Waiting time at the connection			
6.4 MUFATIGUE	116 STRESS	Fatiguing trip			
6.2.1 MORI1MOTIF = 7.77	151 PURPOSE_IMP	Absence of purpose and of destination for the trip	<i>Trip</i>		2, 6
6.2.2 MMOTIFDES = 7.77					
6.4 MURAIISON = 1	149 DEST_IMPORT	Importance of reaching destination	<i>prima-</i>		
6.4 MURAIISON = 3	[Combining variables from 169 DETOUR to 180 SHOW]	Importance of the feelings related to the trip	<i>riiness</i>		

A preliminary inspection of the FNTS survey made clear that we cannot directly trace back each of the above six dimensions to a specific group of FNTS variables. Hence, on the right side of the table we offer an interpretation of the relevant behavioural concept that can be captured by each variables subset and in the last column we list the primary utility dimensions that are related to such a concept, using the same numbering of the above list. We can see from such comparison that dimensions 1 and 5 are those best captured, whereas the distinction between 3 and 4 on the one hand, and 2 and 6 on the other is more blurred.

To sum up, it is surely possible to redefine the primary utility construct on the basis of the FNTS data by incorporating some of the above six dimensions and using the INRETS exploratory results to assess the information loss and the increase of misspecification of the model in terms of decreased internal consistency of the dimensions and decreased discriminant validity. On the other hand, the huge sample size would allow the use of non-parametric estimation techniques for the measurement model, such as Asymptotically Distribution Free Weighted Least Squares (ADF-WLS), avoiding the statistical noise that is generated when some of the distributional assumptions of the variables cannot be fully met.

EXPECTED RESULTS FROM THE FNTS DATASET

As the FNTS follows the protocol of “the public statistics official data” there will not be any result released until the first “official” publication, but only methodology comparison can be made. In the framework of this paper, only some preliminary examples of characteristics with an effect on the probability of some dimensions of travel primary utility will be displayed, after partial non weighted breaking data from the survey field. Other possible statistics are listed in appendix 2.

Hereafter follow a few tables (6 to 11) displaying how selected items do alter the probability of some of the above mentioned primary utility variables. These tables have been elaborated after real survey results from the first two waves. During these two waves, 5993 “Kish” individuals described trips; for each individual, one trip was selected. This trip was less than 10 minutes for 1535 individuals, and thence no primary utility question was asked about it. For the remaining 4221 individuals, this trip was over 10 minutes, and thence the primary utility was passed. Of those 4221 trips, 1085 trips were weekday trips (from Monday to Friday) and 3136 trips were weekend trips (Saturday or Sunday). The distribution of the answers against the following characteristics of the individual or trip was computed: gender, age, main transport mode. No weighting was available, so the results are not representative.

Moreover, quantitative results cannot yet be released, only qualitative effects are given in the tables. Table 5 explains the signs used, for comparing the share of a specific primary utility question answer with average for all individuals. This was done for both weekday trips and weekend trips, but usually, the results were similar, and only one sign was needed. Only when weekday trips and weekend trips showed different patterns, two different signs were used.

Table 5: Keys to the reading of tables 6 to 11

	For an individual and a random trip of more than 10 minutes.
++	share of answer above average for all by more than 10%
+	share of answer above average for all by about 5%
-	share of answer below average for all by about 5%
--	share of answer below average for all by more than 10%
+/-	when results for weekday trips and weekend trips are not similar, first sign relates to the former, and second sign relates to the latter

Table 6: Selected items altering the probability of activities while travelling

Variable: MUACTIONI	With other activity	Without any activity other than travelling
<u>By age</u>		
0-19	++	--
20-29	+	-
65-74	-	+
over 75	--	++
<u>By main transport mode</u>		
Walking	-	+
Two wheelers	--	++
Car driver	--	++
Car passenger	++	--
Public transport	++	--

Table 6 shows that activity while travelling strikingly decreases with age, and is much higher for car passengers and public transport users, because obviously drivers of vehicles and pedestrians must remain concentrated on the traffic. Table 7 states the main activities while travelling quoted by respondents, and table 8 tells that the youngest speak more while travelling (obviously, for speaking with other people, they must not travel alone), while young adults are more keen to making calls or listening to music or the radio.

Table 7: Main activities while travelling quoted by respondents

Variable: MUACTIONIVITE	as first	as second	as third
speaking with other people	++		
listening to music or the radio	+	+	
making phone calls, sending messages	+		
looking at the landscape, the shop windows, the people		0/+	0/+

Table 8: Selected items altering the probability of the first activity while travelling

Variable: MUACTIONIVITE	Without any activities	making phone calls, speaking with sending messages other people	listening to music or the radio
<u>By age</u>			
0-19	--	++	0/+
20-29	--	+	+
30-64		-/0	+/0
65-74	+	0/-	
over 75	++	-	-

Table 9: Selected items altering the probability of pleasantness of trip

Variable: MUSENSATION	Pleasant or rather pleasant	Unpleasant or rather unpleasant	Neither one nor the other
<u>By gender</u>			
Male	-		+
<u>By age</u>			
0-19	+		-
20-29		+	+
30-64	-		+
65-74	+		-
over 75	+	+/-	--/0
<u>By main transport mode</u>			
Walking	++		--
Two wheelers	++	-/0	--
Car driver	--		++
Car passenger	+		-
Public transport	--/-		++/+

Table 9 indicates that males, those 20-64 years old, car drivers and public transport users are less concerned with the pleasantness of the trip, while the youngest and oldest, and those travelling on foot or on two wheels find the trip more pleasant. But according to table 10, walking and cycling (and weekend public transport) are the most physically demanding modes, while weekday public transport is more nervously exhausting, and the choice of weekday driving is justified because it is less tiring. The very old are also more sensitive to fatigue.

Table 10: Selected items altering the probability of tiredness of trip

Variable: MUFATIGUE	Yes, especially nervously	Yes, especially physically	Yes, both (nervously and physically)	No, not tiring
<u>By age</u>				
0-19	-/0	-/0		+
over 75		+		--/-
<u>By main transport mode</u>				
Walking		+		-/0
Two wheelers		+		--/-
Car driver				+/0
Public transport	+/0	0/+	+	-

Table 11: Selected items altering the probability of main reason for travelling

Variable: MURAISON	The only important thing regarding this trip was to get from one place to another	The activities carried out during this trip were important for me	The feelings during this trip were important for me
<u>By age</u>			
0-19			+/-
20-29	+	-/0	
65-74	-	+	
over 75	--/0	++/0	
<u>By main transport mode</u>			
Walking	--	+	+
Two wheelers	--		++
Car driver	+	-	-
Public transport	+	-/0	0/-

Table 11 specifies that young adults, car drivers and public transport users are more destination travellers, while the oldest and walkers are more concerned with activities performed while travelling, and the youngest, bikers and walkers are more seeking some feelings during the trip.

These results look reasonable, but for more quantified and representative relations, the data for the entire survey, and the appropriate weights, should be awaited.

COMPARATIVE RESULTS FROM THE INRETS DATASET

Results related to the INRETS survey dataset are not bound to confidentiality issues such as the FNTS ones, however it is not possible to carry out the same kind of analysis since some of the resulting categories by age and by mode would have too few observation given the characteristics of the sample (164 adult workers). However it is possible to work out some descriptive statistics from the INRETS variables that correspond to the FNTS ones according to table 4 to look at the primary utility issue under a different point of view.

In parallel with the analysis in table 7, we report in figure 4 the absolute frequency of performing various activities during the trip. Only the first three picks of each respondent are reported there, although some of them indicated as much as 8 different activities. Here it is interesting to note not only the most popular activities, but the order in which they were indicated by the respondents. It is noteworthy that INRETS staff reports much more reading and thinking while travelling than the general population in the FNTS.

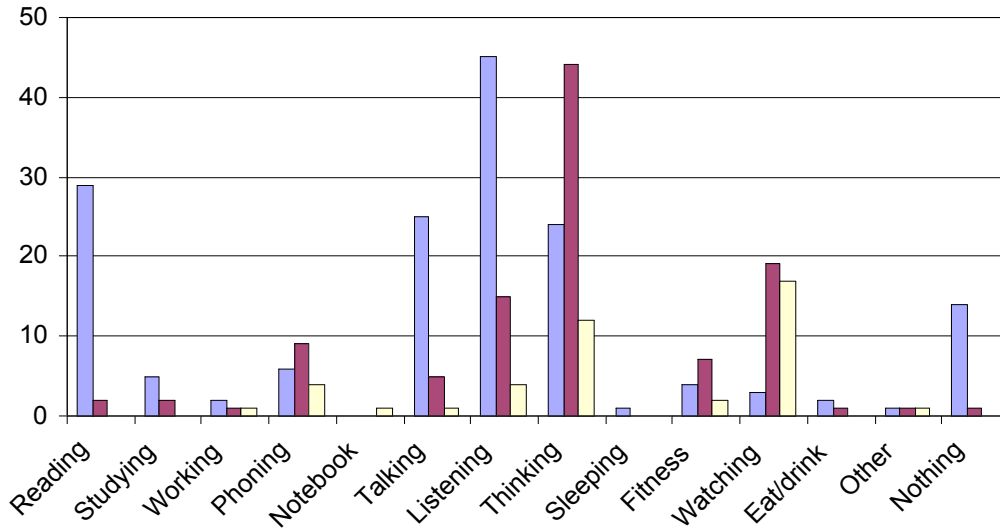


Figure 4: Absolute frequency of performing various activities during the trip; only the first three choices are displayed (n = 164 respondents)

Figure 5 shows the distribution of ratings for the variables 116 STRESS, 149 DEST_IMPORT, 168 ACTIV_IMP and 182 TRIP_LIKING. In order to interpret such plot, the reader is referred to Table 1 where the different scales are specified. It can be seen that 116 STRESS is distributed around the neutral point, whereas trip liking values are more dispersed but with a strong peak of very negative scores. The importance of getting to destination during that trip was paramount for the majority of respondents, but it is interesting to note that 25 respondents (around 15% of the sample) stated on the contrary that this was rather to totally irrelevant. Also the distribution of the importance of the activities performed during the trip that are listed in figure 4 is rather dispersed, thus pointing to a non negligible source of utility for many respondents.

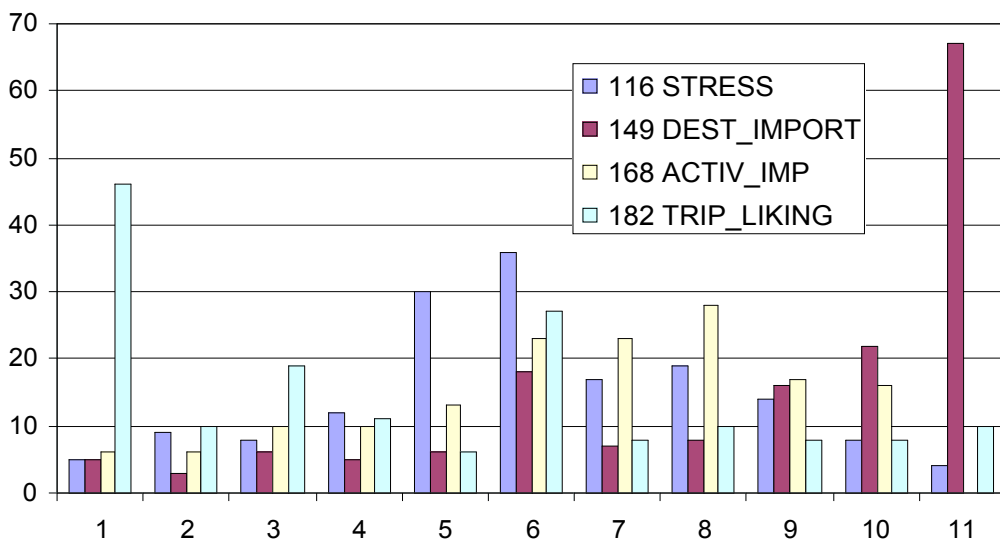


Figure 5: Ratings of some primary utility-related variables that are also present in the FNTS dataset (n = 164 respondents)

Spearman rank-order correlation matrices were computed between the age of the respondent and the variables shown in figure 4. This analysis is then the counterpart of the one that is shown in tables 6 to 11, but the correlations that we found in such a small dataset were not significant. We see here a confirmation of the importance of disposing of a much more articulated dataset with many observations to have statistically meaningful results.

Beyond such preliminary findings, the implementation of the INRETS survey has allowed for the first time to detect the presence of the primary utility in relation with a specific trip, through the definition of a measurement model for this construct. Interestingly enough, some of the trips that had a greater intrinsic utility were work-related, thus confirming previous speculative findings concerning the difference between the primary utility concept and the “recreational” trip purpose. It was also shown that the primary utility is not a prerogative of car drivers, upon which previous research was focused, but it is also detectable for example within trips done by public transport, although to a lesser degree. However it is difficult to understand whether these two key results are sample-specific, given the degree of specialization of the interviewed people (skilled workers dealing with Transport research topics). A detailed account of this research activity is presented in Diana (2008).

CONCLUSIONS

This paper has extensively described two alternative approaches that have been implemented to gather the data that are needed to study a transport behaviour issue such as the primary utility of trips. Consistently with the fact that data from only the first two waves of the FNTS are available for now and moreover with the fact that any quantitative results are still confidential, some analyses showing the influence of key variables (gender, age, transport mode) on variables pertaining to primary utility are presented.

Comparing these results with those of a more complete model developed on the INRETS survey (Diana, 2008) or to pioneering empirical investigations such as Mokhtarian and Salomon (2001) gives an idea of the complexity of the issue and the inherent multidimensionality of the construct. We see in fact that for example car drivers rate lower than the average their trip pleasantness (much lower also than car passengers), and are more single-minded about just getting to their destination. This contrasts with both the above mentioned papers, that provided evidence of the existence of primary utility also for car drivers, and it is a good example of the necessity of not simply looking at single aspects of the issue, since partial perspective could give misleading results. A roadmap has hence to be defined to adequately analyse the FNTS data.

Having this in mind, we believe that the first level of analysis of the primary utility inset in the FNTS, needs primarily to be completed by considering one- and multi-dimensional frequency tables with the procedure described in appendix 2. Once the complete dataset is available and cleaned and confidentiality issues will be dealt with, several additional analyses are of course foreseeable. Correlation analyses could be useful to better understand the relationship among the primary utility dimensions that we defined, the transport means actually being used and the trip purpose, but also with other non instrumental variables or

derived indicators such as the liking of different transport means, the multimodality behaviours or the presence of physical impairments. On the basis of these relatively simple analyses, more complex ones and some modelling exercises could finally be tried, using the INRETS dataset analysis as guide as it has been done in the present paper.

Beyond the obvious objective of gaining further insights on the specific travel-related behavioural phenomenon under investigation, the expected outcome of the above sketched research framework is to define some guidelines that can be useful to understand which kind of survey is most appropriate to study such behavioural issues, and how to take advantage from the complementarities between the two methods. Although the implementation of small-scale focused survey is the way that is usually followed to investigate specific topics, synergies with large-scale mobility surveys that are conducted at the same time could more systematically be exploited.

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APPENDIX 1 : DEVELOPMENT OF THE FNTS PRIMARY UTILITY INSET

Stage 1: first version to insert primary utility questions in the FNTS

The first version of this insertion occurred when the FNTS general questionnaire was being revised, in February-March 2005. The very first idea was to make a distinction for each trip described in the survey to know whether the trip (1) was only motivated by the activity at destination, or also (2) carried some interest in itself, or even (3) was only made for the sake of it.

The third possibility could be covered by including a “promenade without precise destination” purpose in the purpose list (that would have been specified “at destination”), when the trip itself became its sole purpose. Another purpose “practising sport” already existed to cover sport activity as a destination, but that could also be understood as sport while travelling such as bicycling or jogging.

For the rest, to build on the experience of the preliminary findings of the INRETS survey, it was suggested to add one filter question for each trip asking whether the most important thing in this trip was to go from one place to another, or the activities practiced during the trip were important or the sensations felt during the trip were important. Then, in case one of the last two items was chosen, a question would have asked to choose within a list, according to the case, the most important activity, or the most important sensation.

Following a discussion among the authors of this paper, it was felt that the filter question could rebut some respondents, and it was decided to switch it after the other two, that would then have been asked to all. An additional question was also considered to ask whether the respondent would have used a teleportation device for this trip, should such a device exist. To reduce the repetitiveness of these questions on trips, it was decided to ask them only for one selected trip at random after the description of all trips.

Then we had a stimulating contribution by Patricia Mokhtarian, who made three important suggestions. The first one was to add more purposes: one for recreational travel, making the distinction between travelling to a recreational activity at destination and travel as recreation. This last option was already taken into account in the “promenade without precise destination” purpose. She suggested two additional purposes: “wanted/needed to change” and “curiosity”. Unfortunately, it was not possible to include them as only factual items could be accepted for this survey.

Her second suggestion was to ask additional questions for each trip to know whether there was an alternative without travelling for this trip, whether the nearest destination was chosen for the purpose, and whether the fastest practical way of travelling was chosen, in order to capture excess discretionary travel. From this suggestion a tentative question was proposed: “Which alternative solution could you have chosen for this trip ?” Selecting the first one agreed in the list: suppress trip completely, use telecommunication means instead, go to a nearer destination, use a less polluting travel means, follow a shorter route, travel another day, other alternative solution, absolutely no alternative. Moreover, in another part of the questionnaire dealing with routine trips, questions already existed about telecommuting alternatives.

Patricia Mokhtarian’s third suggestion was about activities diaries, that should distinguish activities according to the “degree of physical motion”, and according to their “range”. While this suggestion would be very relevant to time use surveys, it could not be included into the FNTS, since the survey instruments are only vehicle diaries, and daily trips descriptions. Nevertheless, the specific purpose “practicing sport” covers the notion of physical motion.

All this left us in September 2005 with a proposal of five additional questions (activities, sensations, main reason, teleportation, alternative) for one selected trip. More discussions occurred about the way of picking and weighting this trip, as well as on the better way of listing activities in the course of travelling. It was also decided to restrict the primary utility questions to trips of 10 minutes or more.

As the much stricter constraints related to the respondent’s burden compared to the INRETS exploratory survey had to keep into account, the design of this inset was much less free than for the exploratory survey, and the question list had to be kept short. Finally, after a disputed trade-off with other objectives of the FNTS, these questions were chosen among the most insightful ones according to the INRETS survey findings.

The consecutive proposed version included five questions:

- activity conducted during the trip to capture objective travel time use;
- feeling sought during the trip to capture subjective attitude toward travel;
- which was the most important thing in this trip between destination, activity during trip and feeling during trip to establish a hierarchy;
- a teleportation test to determine whether the travel had some value;
- the first preferred alternative to this trip.

Stage 2: CAPI test and second version to insert primary utility questions in the FNTS

In spring 2006 a CAPI test was carried out, and the mean duration of an interview was approximately 2.5 hours (for the 2 visits) which is very burdensome for repetitive questions such as the description of trips, therefore the questionnaire had to be reduced again.

Only the activity and hierarchy questions were preserved, while the feeling question was reduced to two questions about the pleasantness and the tiredness of the trip. Besides, two other questions about incidents were added. The selection of trips was restricted to trips of 10 minutes or more.

The questions that have been retained in the final version of the questionnaire, together with the respective variable names, are as follows:

- MUACTION During this trip, did you have particular activities (outside activities necessary for transport)
 1. yes
 2. no
- MUACTION Which activities were carried out during the trip?
(3 possible answers)
 1. working, studying
 2. reading
 3. making phone calls, sending messages
 4. speaking with other people
 5. playing alone or with other people or carrying out handiwork
 6. listening to music or the radio
 7. thinking, staying alone
 8. looking at the landscape, the shop windows, the people
 9. eating, drinking, smoking
 10. sleeping, drowsing
 11. other (to specify) MUACTIONAUT
- MUINCIDENT This trip was?
 1. Without incident
 2. With incident
- MUQUELINCIDENT Filter, if the trip was “with incident”:
Which kind of incident was it? (maximum of 3 answers)
 1. Broken down vehicle
 2. Vehicle blocked in congestion
 3. Train or subway stopped between two stations
 4. Aggressive traveller with you and/or with someone else
 5. Dangerous behaviour of a driver
 6. Little loss of control of vehicle
 7. Imprudent behaviour of a pedestrian or a two-wheeler who hindered you
 8. Missed connection causing a delay of more than 20 minutes
 9. Other Specify ... MUQUELINCIDENTAUT
- MUSENSATION How did you find this trip (only one answer)
 1. Pleasant or rather pleasant?
 2. Unpleasant or rather unpleasant?

3. Neither one nor the other
- MUFATIGUE Did you find this trip tiring? (only one answer)
 1. Yes, especially nervously
 2. Yes, especially physically
 3. Yes, both (nervously and physically)
 4. No, not tiring
- MURAISSON Which is the sentence that best fits this trip? (only one answer)
 1. The only important thing regarding this trip was to get from one place to another
 2. The activities carried out during this trip were important for me
 3. The feelings during this trip were important for me

Besides those specific questions on the primary utility of travel for one trip, all trips are described with the traditional question about purpose at destination, and for this new issue of the French National Travel Survey, two new purposes are introduced: “promenade without precise destination” and “going to a place for promenade”, so that it will be possible to analyse pure recreational travel for all trips. This very item was lacking in the previous survey and such trips were mixed in the general item “other personal purpose”. Another important purpose item that was present in the last survey was “practising sport” which enabled us to make a typology of cycling (Papon, 1999). With the new item on “promenade” it will be possible to sketch the contours of travelling for its own sake for all transport modes. In this respect, the French word “promenade” is very effective as there are no direct English equivalent.

A more accurate assessment of the primary utility of travel would have been possible if more questions such as those proposed on the preferred alternative or teleportation had been asked in order to detect whether the closest destination, the shortest route had been chosen or extra travel had been deliberately made. Nevertheless, the classification sentence will allow to detect non “promenade” trips that are not primarily aimed at going to the destination.

Moreover, the activity, incident, pleasantness and tiredness questions will describe circumstances that increase or decrease the utility of travel. Crossing these questions with trip purposes, travel modes, or socio-demographics will help to answer such questions as “what is the preferred travel mode?” or “what category of trips makes the most useful (or pleasant) journeys?”. While it will not be possible to specify models with as many variables as in Diana (2008), very accurate measurements of the primary utility of travel are likely to be computed as a sample of some 17000 answers is expected.

APPENDIX 2: DESCRIPTIVE STATISTICS TO BE PROVIDED FOR THE FNTS INSET

Concerning the descriptive statistics of the FNTS variables that are relevant for the study of the primary utility and that are listed in table 2, we can divide them in three levels of priority. At the first level of priority, we should only make one-dimensional frequency tables for the 7 primary utility inset variables MUACTI, MUACTIVITE, MUINCIDENT,

MUQUELINCIDENT, MUSENSATION, MUFATIGUE, MURAIISON, and two-dimensional frequency tables of the most important one MURAIISON that sets the hierarchy of travel motivations with each of the variables

- for the "Kish" respondent characteristics: ANAIS (age), SEXE, SITUA (activity)
- for the concerned trip: MMOTIFDES (purpose), MMOY1S (first travel means)

At the second level of priority, we should make more systematic two-dimensional frequency tables for the 7 primary utility inset variables MUACTI, MUACTIVITE, MUINCIDENT, MUQUELINCIDENT, MUSENSATION, MUFATIGUE, MURAIISON crossed with:

- for the household characteristics: TRANCHRE (income), JNBVEH+JNBCCVUL (motorization), JUTILMOTO (motorcycle used), JUTILCYCLO (moped used), JUTILVELOAD (bicycle used)
- for the "Kish" respondent characteristics: ETC (rode public transport), ETRAIN (rode train), EAVION (rode plane), EVACANCES (had vacations), ESPORT (practices sport), EMAP (walks health recommended level), GPERMIS (car licence), GCONDAUTO (drives car), GAIMCONDAUTO (likes driving car), GPERMIS2R (motorcycle licence), GCONDMOTO (drives motorcycle) GAIMCONMOTO (likes driving motorcycle), GCONDCYCLO (drives moped), GAIMCONCYCLO (likes driving moped), GCONDVELO (rides bicycle), GAIMCONVELO (likes riding bicycle), ICARTABON (public transport pass), GAGENE (hindered in travelling), MQ1G (general health), MVELOQUAND (last time bicycling)
- for the concerned trip : MORIHDEP (departure time), MDESHARR-MORIHDEP (travel time), MMOTIFDES (destination purpose), MMOY1S (first travel means), MNBMOD (number of travel means), MDISTTOT (total distance), MTEMPSMAP (walking time), MTPSATTENT (waiting time), MTC1COND (seated in public transport), MKMAUTORB (travelled on expressway), MACCOMPID (travelled accompanied).

At the third level of priority, three-dimensional frequency tables can be sorted, crossing all 7 primary utility inset variables MUACTI, MUACTIVITE, MUINCIDENT, MUQUELINCIDENT, MUSENSATION, MUFATIGUE, MURAIISON with MMOTIFDES (destination purpose), MMOYPRINC=MAX(MMOY1S, MMOY2S, MMOY3S, MMOY4S) main travel means, and with most or some of the above mentioned other variables related to the "Kish" respondent characteristics, and the concerned trip variables.