

EFFECT OF TIME SPENT OUT OF HOME ON SAMPLING DESIGN AND PRESS READERSHIP MEASUREMENT

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Due to the diversification of audience measurement data collection methods in France over the past ten years (press-button people metering for television, CATI survey for the daily press and radio, face-to-face surveys for magazine press and outdoor advertising) the CESP has been looking at the effect of sampling design and interview method on sample representativity and quality.

Concerning the press, two audience surveys have been running concurrently since 1993:

- the Daily Press survey conducted by phone (IPSOS)
- the Magazine Press survey conducted face to face (AEPM)

The methodologies, presented in detail at the 1995 Berlin seminar, satisfy the requirements of the media in question, but differ noticeably in terms of sampling method, survey protocol and questionnaire. Although specifically adapted to their own medium, daily press in one case and magazine press in the other, a certain number of titles were common to both surveys. For some, and particularly dailies with a high "management" readership, the audience results were significantly higher in the phone survey.

Based on a comparative analysis of the two surveys, the working party set up in 1995 on the initiative of IPSOS and the two organisations representing the daily press put forward the following hypotheses:

- 1) The sampling methods used in the two surveys result in different interviewee profiles. The daily press survey is done over the phone after 6 p.m. in the evening by random selection of phone numbers and five calls per number. This means that individuals who work, and thus more mobile can be easier reached by a telephone survey than by a face-to-face survey realised during the day, using one single contact.
- 2) The differences observed in samples interviewed could affect the media audience results in an inverse manner from one medium to another.

To test the hypotheses, the working party suggested supplementing the standard socio-demographic criteria with one on behaviour: individual mobility. As an initial approach to understanding mobility, it was proposed to ask a question on time spent out of home and see how the variable correlated with media consumption.

Data from the CESP Multimedia Time-Budget survey, presented at the San Francisco seminar in 1993, confirmed the hypothesis for each of the media as a whole:

Media consumption according to time spent out of home

(base: Monday-Friday)	Did not go out	Less than 2 hrs	2 to 4 hrs	4 to 6 hrs	6 to 8 hrs	8 to 10 hrs	10 to 12 hrs	12 hrs and more	all
PRESS (mean number of titles read yesterday)									
NATIONAL DAILIES	0.06	0.10	0.11	0.11	0.13	0.12	0.16	0.19	0.12
REGIONAL DAILIES	0.41	0.41	0.43	0.42	0.43	0.40	0.38	0.38	0.41
TV MAGAZINES	0.53	0.56	0.56	0.51	0.52	0.47	0.45	0.37	0.50
NON-TV MAGAZINES	0.37	0.41	0.47	0.46	0.43	0.36	0.37	0.35	0.41
RADIO-TV (audience time per person)									
RADIO	120.8	130.1	118.7	121.4	112.7	123.4	135.3	152.5	126.2
TV	307.1	293.3	263.6	223.4	191.3	163.9	127.8	95.2	211.5

(MMTB survey 91/92: entire population of 15 years and over)

Among the main subjects of interest, we find:

- that the mean television viewing duration was inversely proportional to time spent out of home: 5 hours watching TV for individuals out of home less than 2 hours, compared to a mean viewing duration of 95 minutes in individuals out of home for more than 12 hours.
- similarly, and parallel with television watching, reading TV weeklies decreased progressively with increasing time spent out of home,
- on the other hand, reading national of dailies went in the other direction: the mean number of titles read increased smoothly with time spent out of home.

Lastly, time spent listening to the radio was not particularly related to amount of time spent at home. On the other hand, exposure to outdoor advertising, not shown on this table, obviously was.

In addition, using the quota method, without revisiting in the case of face-to-face surveys, but with several repeat calls in the phone surveys raises the problem of presence at home and all its consequences on the probability of contacting the more mobile individuals, something more noticeable in France than other countries.

Our research on mobility concentrated on two axes:

- 1) processing the results of two surveys providing us with detailed, precise data on mobility: the *Multimedia Time-Budget Survey* carried out by the CESP in 1991/1992 and the *Transport 93/94* survey carried out by the INSEE (Institut National de la Statistique et des Études Économiques [French agency for statistics and economic information]).

The objective of this first stage was:

- ⇒ to analyse individuals' behaviour according to how they use their daily time in terms of travel, and activities both at and out of home,
 - ⇒ to compare the results of two surveys based on different methodologies (quota *versus* random sampling, questionnaire on time spent travelling *versus* the time-budget approach, etc.),
- 2) adding two questions, worded exactly the same, on time spent out of home at the end of both press readership survey interviews. This second phase of our research was designed to:
 - ⇒ evaluate the effect of interview method (telephone *versus* face-to-face),
 - ⇒ analyse the structure of the two samples according to this criterion,
 - ⇒ check the correlation between time spent out of home and press readership.

The point was to compare the different sampling methods, to analyse interviewee profile according to a variable different to the usual socio-demographic criteria in order to improve the methodologies used now and, consequently, the quality of sampling designs.

1. Analysis of the mobility data in the CESP "Time-Budget" survey and the INSEE "Transport" survey:

In France today, we have two relatively recent surveys giving us data on time spent out of home, based on somewhat different methodologies:

- The CESP Multimedia Time-Budget survey of 91/92 was based on the use of time spent yesterday and concentrated on analysing consumption of the various media during one's daily occupations.
- The INSEE Transport 93/94 survey concentrated on reconstituting yesterday and longer-term travel, in order to study individuals' mobility and the types of transport used.

The main methodological characteristics of the two surveys were the following:

Comparison of main methodological aspect of the two surveys

TIME-BUDGET MULTIMEDIA CESP 91/92	TRANSPORT SURVEY INSEE 93/94
face-to-face	face-to-face
sample: 18,000 individuals of 15 years and over	sample: 14,213 individuals of 6 years and over (response rate: 81.7%)
two-level sampling design: <ul style="list-style-type: none"> - random selection of sampling points (2280) according to matrix of regions × habitat categories - 8 interviews per sampling point - selection of individuals according to the quota method 	two-level sampling design: <ul style="list-style-type: none"> - random selection of 20,000 addresses taken from the population census and matrix of regions × habitat categories - selection of individuals according to the KISH method
<ul style="list-style-type: none"> - 365 survey days - 12 monthly waves - equi-distribution over the 7 days of the week 	<ul style="list-style-type: none"> - 312 survey days - 8 monthly waves - equi-distribution over 5 days of the week
data collection: <ul style="list-style-type: none"> - yesterday time-budget (time grid, 5min/5min, from 3am to 3am the next day) - 63 coded and listed activities - home/travel/Out of home 	data collection: <ul style="list-style-type: none"> - reconstruction of travel (from 4am to 4am the next day): <ul style="list-style-type: none"> yesterday (base: Monday to Friday) last Saturday last Sunday - travel: reason + place of departure and place of arrival
<u>specific processing:</u> <ul style="list-style-type: none"> - interviews done Tuesday to Saturday <ul style="list-style-type: none"> ⇒ reconstruction of time spent out of home from Monday to Friday according to travel leaving home/returning home 	<u>specific processing:</u> <ul style="list-style-type: none"> - interviews done among individuals of 15 years and over <ul style="list-style-type: none"> ⇒ reconstruction of time spent out of home from Monday to Friday according to travel leaving home/returning home

Although the data collection is somewhat different, comparing the time spent out of home data from the two surveys allows us to analyse the effect of sampling method (quotas *versus* random) on interviewee profile.

In the first phase, the Time-Budget survey data, obtained as in most audience surveys in France from a quota method, were compared with those from the Transport survey obtained using a random method.

To do the survey, the INSEE performed a random selection of addresses from the population census database and used another random selection method to designate the person to interview in each household (KISH method). A letter was sent to each household to advise them of the interviewer's coming.

The survey obtained a particularly high response rate (81.7%). We therefore considered that, from the sample quality viewpoint, the survey could be taken as reference.

To study mobility, we used two types of result:

- 1) Average time spent out of home yesterday on the basis of an average day from Monday to Friday,
- 2) Sample distribution according to time spent out of home.

The following table gives the mean time spent out of home according to the main socio-demographic criteria:

Comparison of time spent out of home yesterday by socio-demographic criteria

	MMTB 91/92	Transports 93/94	<i>difference</i>
	in hours and minutes	in hours and minutes	
ALL	6 hrs 11	5 hrs 39	+ 32 min
Men	7 hrs 29	6 hrs 34	+ 55 min
Women	5 hrs 00	4 hrs 48	+ 12 min
15 to 24 years	8 hrs 02	7 hrs 07	+ 55 min
25 to 34 years	7 hrs 13	7 hrs 14	- 1 min
35 to 49 years	6 hrs 52	6 hrs 58	- 6 min
50 to 64 years	5 hrs 21	4 hrs 29	+ 52 min
65 years and +	3 hrs 08	1 hrs 54	+ 74 min
self-employed	7 hrs 13	6 hrs 32	+ 41 min
management, senior prof.	8 hrs 31	8 hrs 55	- 24 min
intermediate prof.	8 hrs 00	8 hrs 15	- 15 min
white-collar	6 hrs 52	6 hrs 53	- 1 min
blue-collar	7 hrs 52	7 hrs 43	+ 9 min
retired	3 hrs 33	2 hrs 13	+ 80 min
pupils, students	7 hrs 57	7 hrs 14	+ 43 min
housewives	3 hrs 23	2 hrs 31	+ 52 min
Greater Paris Region	6 hrs 34	6 hrs 50	-16 min
Other regions	6 hrs 01	5 hrs 23	+ 38 min

For the whole population of 15 years and over, the mean time spent out of home was 32 minutes more in the Time-Budget survey. Given the different methods used and type of data gathered, this should not come as much of a surprise. However, the differences between the two surveys also vary from one population category to the next: the two surveys give very similar results for the intermediate age groups (25-49 years) and for individuals exercising a profession, except for self-employed where it is more difficult to distinguish between home and outside home.

In the CESP survey, on the other hand, the differences in duration are always greater for the young, for retired people and, generally speaking, anybody without a professional occupation.

Here, we hypothesise that for certain population categories, elderly people in particular, there is a relation between actual mobility and the fact of accepting to answer an interview. For these categories, the acceptance bias would thus be greater than the presence-at-home bias. It is highly probable that the institutional nature of the INSEE survey plus the letter announcing the arrival of the interviewer made it easier to interview individuals who would have refused one from an interviewer working on a quota basis for a private company.

In terms of geographical distribution, the differences observed between the Paris region and outside Paris could be explained by the interview times and sample structure. The more mobile Parisians get back home later and are thus less easy to contact when the interviewer calls, and in quota surveys there are no second calls anyway. We may therefore hypothesise that these individuals are better represented in the Transport survey due to second calls in the event of absence.

The sample distributions of time spent out of home, for the 15 years and over and the 50 years and over, confirm the hypothesis:

Mobility distribution by age

	ALL 15 YEARS AND OVER		50 / 64 YEARS		65 YEARS AND +	
	CESP MMTB 91/92	INSEE Transports 93/94	CESP MMTB 91/92	INSEE Transports 93/94	CESP MMTB 91/92	INSEE Transports 93/94
	in %	in %	in %	in %	in %	in %
0 hrs	8.4	16.9	9.4	20.3	19.5	39.9
0-1 hrs	5.9	6.7	5.8	7.3	10.4	11.3
1-2 hrs	9.0	9.0	9.3	12.2	15.9	15.7
2-4 hrs	16.5	13.0	21.3	17.2	22.1	17.9
4-6 hrs	13.7	8.7	15.4	9.7	16.6	7.1
6-8 hrs	10.3	8.1	12.3	7.7	7.5	3.8
8-10 hrs	12.1	14.8	9.7	11.8	4.2	2.4
10-12 hrs	12.4	14.8	9.0	9.2	1.8	1.3
12 hrs and +	11.5	7.9	7.9	4.6	2.2	0.6
TOTAL	100.0	100.0	100.0	100.0	100.0	100.0

The proportion of individuals interviewed who did not move from home was significantly higher in the Transport survey (16.9% as against 8.4% in the Time-Budget survey) and this difference increases for the older individuals (40% as against 19.5%).

To conclude this first part, although time spent at home should be taken into account for certain categories of highly mobile individuals, in big towns especially, due to day-time interviewing from 9 a.m. to 8 p.m., the bias on sample structure seems to be distinctly less than that related to refusals from people who do little outside home, and not related to the quota method.

2. Analysis of mobility data from a face to face survey and a telephone survey

The second stage of our analysis focused on mobility data collected in the two French national readership surveys : The AEPM survey which measures the audience of French magazines and the IPSOS daily newspaper survey. The interest of a comparison of mobility data of the two surveys was not only to find possible explanations for different readership figures for titles results in both surveys but also to evaluate the incidence of different sample designs on individual probability of being included in the samples.

The following table gives an overview of the most important methodological characteristics of both surveys :

Comparison of main methodological aspects of the two surveys

AEPM MAGAZINE SURVEY	IPSOS DAILY NEWSPAPER SURVEY
Face to face on paper support	Telephone on CATI support
Sample size : 15000 including 3000 boost sample for AB+ households	Sample size : 19500
Sampling method : Two level sampling design - random selection of sampling points according to matrix of regions x habitat categories - 6 interviews per sampling point - no systematic recall - selection of individuals according to the quota method	Sampling method : Two level sampling design - random selection of starting telephone numbers according to matrix of regions x habitat categories - random digit dialling : up to 5 calls at different hours and days for each selected number - selection of individuals according to daily quotas but possibility of appointments if an individual does not fit into the quota at a specific moment of interviewing
Fieldwork : - data collection over 12 months - equi-distribution over the 7 days of the week - interviewing between 9 a.m. and 8 p.m.	Fieldwork : - data collection over 10 months excluding July and August - equi-distribution over the 7 days of the week - interviewing between 6 p.m. and 9 p.m.
Media included : - about 130 magazines (weeklies, fortnightly, monthlies and bi-monthlies) - frequency of daily newspapers	Media included : - 10 national daily newspapers - 1 - 3 regional daily newspapers - 0 - 5 regional weekly newspapers - 10 weekly magazines
Time spent out of home: - yesterday - average weekday between Monday and Friday Sample used for analysis : 5914 interviews realised from January to June 1997 (Tuesday to Saturday interviews)	Time spent out of home: - yesterday - average weekday between Monday and Friday Sample used for analysis : 8378 interviews realised from January to June 1997 (Tuesday to Saturday interviews)

As we already have pointed out a certain number of titles are studied in both surveys, which gives us the possibility to compare readership figures from the two surveys in order to estimate the incidence of the different sampling methods applied. Indeed, we can find higher readership figures for national quality newspapers and newsmagazines in the telephone survey whereas readership figures for TV weeklies are significantly higher in the face to face survey. Regional daily newspapers with their large 'horizontal' penetration get similar results in both surveys. Given the characteristics of these titles groups it was obvious that these differences had to be explained by other means than usual social-demographic analysis and categories.

Both surveys have a similar sample structure when compared on sex, age, working status and other usual criteria and both surveys are weighted by nearly the same criteria coming from the same statistical basis. In order to analyse the possible sampling effects and specially the impact of different fieldwork hours on individual probability of being included in the samples, it was decided to consider the «time spent out of home» factor on both samples by introducing two questions with identical wording in the questionnaires. The hypothesis was that if both surveys find the right number of managers, blue collar workers and housewives, they do not sample individuals with the same characteristics in terms of 'lifestyle'. The formula was :

« An average 'face to face' individual is not identical with an average 'telephone' individual»

The questions introduced in both surveys were the following :

« Yesterday, how much time did you spend out of home? Please think about all activities which you could have had out of your home for professional reasons, studies, hobbies, travelling, shopping or for any other reason.»

« And usually during an average week-day from Monday to Friday : how much time do you usually spend out of your home?»

The data proceeding from the yesterday question was assumed to be more appropriate to characterise the samples than the information obtained from the average week day question . The latter was introduced in order to avoid the bias coming from respondents who usually spend a certain amount of time outside home and who did not go out yesterday : they were able to declare what they usually do. All analysis done on «time spent out of home» or mobility was carried out on the yesterday-question.

Comparison of the data collected between January and June 1997 shows significant differences between the two surveys :

Time spent out of home yesterday by socio-demographics

	FACE TO FACE SAMPLE	TELEPHONE SAMPLE	<i>difference</i>
	in hours and minutes	in hours and minutes	
ALL	5 hrs 51	6 hrs 47	+ 56 min
Men	6 hrs 56	8 hrs 06	+ 70 min
Women	4 hrs 50	5 hrs 33	+ 43 min
15 to 24 years	7 hrs 47	8 hrs 18	+ 31 min
25 to 34 years	7 hrs 07	8 hrs 12	+ 65 min
35 to 49 years	6 hrs 44	7 hrs 58	+ 74 min
50 to 64 years	4 hrs 56	6 hrs 06	+ 70 min
65 years and +	2 hrs 45	3 hrs 19	+ 34 min
self-employed	7 hrs 44	9 hrs 03	+ 79 min
management, senior prof.	8 hrs 24	9 hrs 28	+ 64 min
intermediate prof.	7 hrs 55	8 hrs 54	+ 59 min
white-collar	6 hrs 19	7 hrs 33	+ 74 min
blue-collar	7 hrs 23	8 hrs 34	+ 71 min
retired	3 hrs 11	3 hrs 30	+ 19 min
pupils, students	7 hrs 41	8 hrs 11	+ 30 min
housewives	2 hrs 38	3 hrs 02	+ 24 min
Greater Paris Region	6 hrs 27	7 hrs 29	+ 62 min
Rest of France	5 hrs 43	6 hrs 37	+ 54 min

Respondents from the telephone survey declare having been out nearly one hour more than the respondents in the face to face survey. As we collected our 'mobility' data by means of exactly the same question, these differences can only be explained by methodological differences of the two surveys.

Comparison of the results by usual socio-demographic criteria shows, however, in the telephone-survey a significant higher 'mobility'-level for respondents aged 25 to 64 and the working population whereas data for respondents identified as 'retired', 'students' or 'housewives' seem to be much closer to the face to face survey.

Both samples include a very similar proportion of individuals who did **not** go out yesterday. If this was the result that we expected to find on the individuals defined by one of the working status categories it was more surprising for the non-working categories where activities may vary more.

These observations seem to indicate that the differences between the two sampling methods are more important for categories of individuals who are supposed to be 'mobile'. Analysis of the distribution of 'time spent out of home yesterday' by socio-demographic categories was therefore necessary for a better understanding of the differences we have described. We concentrated our analysis on working/non-working categories which have been proved to have the most discrepancies in terms of average time spent out of home.

Mobility distribution by working categories (in %)

WORKING STATUS	ALL	DID NOT GO OUT	0 TO 4 HOURS	4 TO 8 HOURS	8 TO 10 HOURS	10 HOURS AND MORE
Managemt, senior						
-Face to Face	100	4.0	17.4	17.2	15.0	45.9
-Telephone	100	3.8	8.7	14.6	12.8	60.1
Intermediate prof						
-Face to Face	100	4.2	17.4	19.6	17.7	40.9
-Telephone	100	3.9	12.6	15.5	15.6	52.3
White collar						
-Face to Face	100	8.2	28.1	23.3	16.0	24.0
-Telephone	100	6.9	15.4	21.1	18.8	37.9
Blue collar						
-Face to Face	100	5.7	20.4	21.7	14.5	36.9
-Telephone	100	5.6	14.0	12.6	18.3	49.4

Differences between the two samples become obvious when focusing on individuals who went out yesterday. The face to face sample includes systematically more working individuals with a low (up to 4 hours out of home) or medium (4 to 8 hours out of home) mobility degree. Consequently, highly mobile working individuals (more than 10 hours out of home) are less represented than in the telephone survey.

When looking for the reasons for these differences, it would have been interesting to analyse these figures by full time/part time working categories. We do not have this information in the surveys and it was therefore necessary to analyse the currently working criterion thus excluding the unemployed or other individuals who are currently not working (for example for health reasons).

The new comparison does not modify the first observations. We can reasonably suppose that analysis on full-time/part-time working criteria would not produce a significantly different outcome.

Observations of mobility distribution on non-working categories produce similar figures : highly mobile individuals tend to be more represented in the telephone sample :

Mobility distribution of non-working categories (in %)

STATUS	All	DID NOT GO OUT	0 TO 4 HOURS	4 TO 8 HOURS	8 HOURS AND MORE
Retired					
-Face to Face	100	19.8	43.5	28.6	7.5
-Telephone	100	22.9	38.5	27.2	11.4
Students					
-Face to Face	100	5.8	11.4	31.7	51.0
-Telephone	100	4.7	10.6	25.9	59.4
Housewives					
-Face to Face	100	21.9	50.4	22.4	5.2
-Telephone	100	20.0	45.1	29.3	5.6

We can conclude that telephone interviewing seems to be more appropriate to contact and to interview the most 'difficult' populations, high status businessmen but also students or highly active retired individuals.

What do these results mean for the sampling methods used in the french national readership surveys ? They demonstrate that face to face interviewing between 10 a.m. and 8 p.m. does not give the same probability for high mobile individuals to be included in the sample than less or medium mobile individuals.

It was therefore necessary to look for other strategies in order to maximise the individual probability of being included in a face to face sample. The question here is not to adopt a pure random sampling method unless we possess the instruments necessary for doing a good one. Nevertheless we are considering the opportunities to integrate new procedures at the fieldwork stage : those procedures could be the following:

- starting interviewing at about midday instead of 9 a.m. : This would mean our interviewers would work later in the evening , when 'mobile' individuals have a better chance of being included in the sample
- introducing the possibility of appointments for those individuals, who accept the interview at another moment of the day
- distribution of appropriate documents which give information about the survey.

3. Conclusions and Outlook

New fieldwork procedures for face to face surveys should however not be the only response that we have to deduce from the 'time spent out of home yesterday' experiment in the two surveys. Indeed, we should not forget that even if the two sampling methods generate different mobility distribution patterns, they are both representative of individuals who did not move from home yesterday. Those 'non-mobile' individuals are however much more taken into account by the INSEE Transport survey, which has already been described.

SURVEY	METHOD	NOT BEEN OUT OF HOME	
		All 15 years +	Not working
AEPM	face to face quota	11.3	16.5
IPSOS	telephone random (+ quota)	10.7	16.8
CESP	face to face quota	8.4	12.7
INSEE	face to face random	16.9	27.1

This important difference can only be explained by the exceptionally high response rate of this survey. The bias introduced by the important methodological differences in the first three surveys appears to be minor compared to the response bias. **Consequently the challenge of individual mobility affects random samples as much as quota samples.**

The individual 'mobility' seems to be an appropriate means for complementary analysis on sample-structures which do not only take into account the usual socio-demographic criteria. These criteria hide important differences in the samples which generate different readership figures.

However, individual 'mobility' does not seem to be a criteria which could be introduced in the sampling process, for example by setting new quota or being used for specific weighting procedures. The total amount of time spent out of home and their distribution given by each of the four analysed surveys do not allow us to establish a generally recognised norm.

If 'time spent out of home' gives us a better understanding of our samples it will also help us to understand media-consumption. This aspect of individual 'mobility' becomes crucial when we consider the trend of surveys including print, radio, TV and -why not- outdoor advertising which will lead us directly to multi-media planning. Consequently, in a very near future, aspects of individual 'mobility' will not only decide on the relative strength between titles but on the position of the print media in the general inter-media competition including other media which are extremely sensitive to the question of 'mobility'. TV audience figures would indeed not be the same with an 'immobile' sample as they would be with a 'mobile sample'. We consider therefore that there is a need for further investigation, even there where random sampling techniques seem to avoid some of the specific problems of quota-samples.

