

Traditional versus modern: A comparative study of door-to-door and IVR survey techniques in opinion polls¹

Tradicional versus moderno: Um estudo comparativo sobre as técnicas metodológicas de porta a porta e URA nas pesquisas de opinião

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ABSTRACT

Using new technologies to collect data efficiently and in a statistically relevant manner is a constant challenge for the market research industry. This article contributes directly to this debate. The article presents and compares two different methodological techniques of data collection: traditional door-to-door surveying and Interactive Voice Response (IVR) polls. The latter relies on technology. The hypothesis is that when correctly applied, new research methods will achieve results that are convergent with those achieved using traditional methods, and at a fraction of the cost and time. The study evaluates results obtained using both methods and discusses their differences and limitations through a case study. Main results were convergent, a conclusion that contributes to broadening the debate on appropriate/adequate ways to conduct market research while also considering costs and effectiveness of the process.

KEYWORDS: Data collection techniques; Case study; IVR; Door-to-Door.

RESUMO

A utilização de novas tecnologias para coletar dados de maneira eficiente e estatisticamente relevante é um desafio constante no setor de pesquisa de mercado. O presente artigo contribui diretamente com esse debate. O trabalho apresenta duas técnicas metodológicas de coleta de dados diferentes: a tradicional porta a porta e a Unidade de Resposta Audível (URA) que, basicamente, faz uso de tecnologia. A hipótese é de que a utilização de novos métodos de pesquisa permitirá alcançar resultados convergentes, porém, com uma fração do custo e do tempo. O estudo avalia os resultados obtidos por ambos os métodos, suas diferenças e limites por meio de um estudo de caso. Os principais resultados obtidos foram convergentes e possibilitam ampliar o debate sobre uma forma mais adequada de se conduzir uma pesquisa de mercado, considerando os custos e a efetividade do processo.

PALAVRAS-CHAVE: Técnicas de coleta de dados; Estudo de caso; URA; Porta a Porta.

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1 INTRODUCTION

Increased productivity is certainly one of the objectives for any sector of activity and market research market is among these. In constant search for increased productivity, research companies seek increasingly creative solutions to increase the efficiency of data collection and the intelligence achievable from the data collected. This article presents a comparative case study that illustrates two distinct data collection methods and contributes to the discussion of new technologies (specifically IVR), their different methodologies and their effects on overall performance.

Quantitative methodologies are generally the most widespread in market and opinion research, to measure opinions, habits, feelings, attitudes and reactions of an audience (Almeida, Marchi & Pereira, 2013). Between 1940-1970, the main forms of data collection were by letter or face-to-face surveys, also known as door-to-door, which happens when interviews are conducted personally. (Szolnoki & Hoffmann, 2013). However, driven by demand from society for innovative products and more efficient processes, new technology alternatives continue to come up.

The use of resources beyond "paper and pen" in polls increased dramatically over the last decade (Nagy & Warren, 2010). According Calliyeris and Las Casas (2012), in the late 1990s and early twenty-first century, researchers pushed the methodological advancement of research with the introduction of technological practices, such as surveys conducted over the Internet, by computer and using voice recognition systems, called Interactive Voice Response (IVR), referred to in portuguese as *Unidade de Resposta Audível (URA)*. Arguably, IVR is one of the most important research methodology developments of recent times.

As a result, these developments enabled companies to use powerful tools that transform interaction with the object/target of their research. The use of technology to capture data through IVR allows quick access to thousands of people of many different profiles. Results are fast and generate considerable cost savings. The survey takes the form of a telephone interview where the human interviewer is replaced by an interactive recording of high quality, which respondents react to by pressing keys on the phone itself (Corkrey & Parkinson, 2002).

Despite the importance of comparing data collection methods, response results and rates, as well as effect patterns, and despite the fact that IVR emerged in the early 1990s in some countries, the technique remains relatively unexplored (Calliyeris & Las Casas, 2012), both by the scientific community and research firms that opt for more common methods.

The study of different methodological approaches is the object of analysis of scholars who delve on the subject of different forms of data collection (Corkrey & Parkinson, 2002; Leeuw, 2005; Dillman et al., 2009). Two basic methods of quantitative data collection stand out: one that is by interviewers and one conducted without an interviewer (Leeuw, 2005).

The studies focus mainly on online surveys, door-to-door and variations via phone regarding response rates on sensitive issues, social "desirability" or "do not know" responses to the questionnaire. Other research offer comparisons on the quality and representativeness of these new research forms (Szolnoki & Hoffmann, 2013). There is a third track that compares results of the costs involved and the total time required to achieving each research (Dickinson, Faria, & Friesen, 1994).

The present study falls into the third category and aims to compare and discuss results, contrasting a classic method of quantitative research that makes use of interviewers and occurs door-to-door, with a more modern survey, without the presence of an interviewer and that utilizes IVR technology (Corkrey & Parkinson, 2002). As mentioned, the aim with this study is to stimulate discussion on the use of contemporary research techniques, cost-effectiveness, effectiveness and applicability.

For this analysis, the authors focused on a survey conducted by Ideia Inteligência with the support of the National Front of Mayors of Brazil, in April 2015, using the door-to-door method.

A second survey using IVR was completed as a control, on the same subject in June/July of the same year. Thus, it was possible (although data collection did not occur on exactly the same dates) to compare the methods and their results from a basic multivariate analysis.

The hypothesis of this study is that a comparison between collection methods with the traditional dichotomy versus the recent enables the confrontation between techniques, which contributes to the analysis of: (i) interview time, (ii) cost and (iii) the final result, in order to weigh pros and cons of using of certain methodology to specific cases, seeking thereby to improve results and minimize the weaknesses of each method.

The objective of this study is to evaluate the results of the data collection method door-to-door and IVR, as well as highlight their differences, advantages, disadvantages and limitations. Through a case study, discussion will consider how different information collection methodologies can meet information needs and how Brazilian subjects respond to a new method, without the intermediation of interviewers, opposing customary socio-cultural behavior and norms.

Despite increasing importance of multi-modal approaches in literature (Leeuw., 2005; Dillman et al, 2009) noted for its goal to improve overall participation rates by allowing combinations of different methods emphasizing the advantages of each technique and compensating their limitations, it is not the intention here to use this technique. Although in some cases the multimodal choice is important to study, for example, as a way to improve response rates, the focus of this article is different. It intends to highlight the importance of methodological study mode comparison to point out advantages and disadvantages between two data collection techniques and contribute to discussion on the use of more modern approaches to polling to go beyond regular, standard approaches and pursue advances in techniques.

Thus, the main contribution is the discussion of how the techniques and methodologies can be improved and updated to keep up with the pursuit of productivity in society and especially in companies and research institutes.

2 LITERATURE REVIEW

Several studies are based on the comparison of different data collection methods in a research aiming to show contrasting aspects of each. With the emergence of new tools and increased access to technology, there was an increase in the verification of traditional techniques with the most current, for example, comparisons with Web surveys (Couper, 2000; Szolnoki & Hoffmann, 2013), telephone interview assisted by computer or Computer-Assisted Telephone Interview (CATI) (Havice & Banks, 1991), IVR (Nagy & Warren, 2010) and between three and others (Kreuter, Presser, & Tourangeau, 2008; Sakshaug et al., 2010).

For being a relatively new topic, Brazilian literature on the Interactive Voice Response (IVR) is embryonic, being necessary to resort several times to foreign studies for academic information on the subject. It is possible to verify that converges the opinion of many authors as the main advantages of using the data collection method via IVR: increased application speed, low cost (Lieberman & Naylor, 2002; Calliyeris & Las Casas, 2012; Havice & Banks, 1991) and minimum interviewer "bias" (Corkrey & Parkinson, 2002).

The speed in the conduct of research is attributed to the fact that the questions and their answers are delivered virtually, and the tabulation of the data is generated by the database electronically and made available in real time, without the need to involve a researcher to handle the information.

Lower costs result from lower spending, mainly in relation to the interview which has as collection instrument, pen and paper, saving on materials for printing questionnaires, cost of typing, among others. However, the real economy comes from eliminating the need for interviewers who become expendable. Another advantage of the absence of an interviewer is that it decreases the chance of bias either in posing the question as well as regarding respondent answers.

According to Corkrey and Parkinson (2002) the fact that an interview is conducted by telephone and via a recording, generates greater confidentiality and this may result in a response with less bias, in other words more honest and transparent answers, especially in regard to more sensitive issues. Moreover, the technique helps reach large populations and hard to reach groups, it is convenient for remote access enabled by automated systems that operate 24 hours a day and use a simple form of communication, since phones are simple to use and familiar to most people (Lieberman & Naylor, 2002).

According to Schutt (2009), IVRs have been used successfully for short questionnaires and situations where respondents are highly motivated to participate. Within these standards, response rates tend to be high, often above 80% because few people would turn it off or refuse to answer a polite call.

Some disadvantages related to the use of IVR include: time and initial financial resources to develop the recordings and acquire the software needed to run the system and maintain a support team for all the time database. A possible alternative would be to hire a company that offers sending IVR services with the system already created (Lieberman & Naylor, 2002). Other constraints are: the need to have a previous database with information to telephone contact and the inability to ensure exactly who answered the call and answer (s) the question (s).

Since literature on face to face is plentiful, and its use is more common, its advantages and disadvantages are more recognized both in the academic sphere and by trade/commercial entities and institutes. According to Holbrook et al., (2003), face-to-face surveying also has its strengths. The technique is well structured, flexible, adaptable, and are based on personal interaction so there is a possibility of observation of respondents and even physical stimuli can be encouraged. On the downside, the authors point out that there may be bias by the interviewer, high cost and geographic limitations.

According to Schutt (2009), the main advantages of door-to-door are: response rates are higher than with any other form of data collection, questionnaires can be longer and more complex than with the IVR, the physical and social conditions of respondents can be monitored and questions can be clarified if there is any doubt. However, as stated previously, the presence of the interviewer, can bias the research if they are not adequately trained, making results less reliable and potentially less valid.

From a comparison study of traditional telephone survey use with automated research via telephone (ADAD), similar to IVR, Dickinson, Faria and Friesen (1994), found that results were very similar, but the technological resource was more economical.

Similarly, Bauer, Truxilo, Paronto, Campi and Weekley (2004) found that the cost "per unit" of IVR is lower than that of research by telephone and door the door because the cost of the interviewer is eliminated and thus the cost-effectiveness of IVR becomes a strength when compared to other methods.

Tables 1 and 2 show the advantages and disadvantages of using IVR and face-to-face methods.

Table 1
Advantages of face to face and IVR methods

Advantages of face to face and IVR methods	
Face to face	<ul style="list-style-type: none"> ▪ High response rates; ▪ Questionnaire may be longer and more complex; ▪ Physical and social conditions of the respondents can be monitored; ▪ Questions can be clarified if there is doubt.
IVR	<ul style="list-style-type: none"> ▪ Increased conduction velocity; ▪ Low cost; ▪ Ability to reach large populations and hard to reach groups; ▪ Remote Access; ▪ Work almost 24 hours a day.

Table 2
Disadvantages of face to face and IVR methods

Disadvantages of face to face and IVR methods	
Face-to-face	<ul style="list-style-type: none"> ▪ High cost; ▪ Geographical and temporal limitations; ▪ Subject to influence of the interviewer; ▪ Increased deadline for completion.
IVR	<ul style="list-style-type: none"> ▪ Bias when interviewing landline holders; ▪ Need to have a prior database; ▪ Inability to provide exactly who answered the call and answer (s) question (s).

3 METHODOLOGY

The work was developed using a comparative study that took into account a Brazilian case in which cost, time, and final results of both studies are highlighted and examined.

The face-to-face survey, conducted by Ideia Inteligência, was conducted as a traditional-face survey on political and administrative matters involving various topics and 30 municipalities divided by the size of their population and classified as small, medium and large. The interviews were conducted by a team of interviewers hired and trained to approach this type of public. There was filtering on all questionnaires during the interviews and quality control.

Public data collection took place from 28 March to 1 April 2015. 5,009 home interviews were conducted with a sample drawn from the 2010 Census data. The universe was composed of residents from selected municipalities, probabilistically, observing the following criteria:

- Population aged 16 or over resident in the sectors;
- Gender - Male and Female;
- Age groups - 16-24, 25-34, 35-44, 45-59, 60 and over.

The application of IVR obtained 50,004 valid interviews from a national list of landlines. The public data collection took place between June 29 and July 3, 2015 (with calls being made between 14h and 21h).

The sample was structured in a probabilistic way (random sampling of a national base of 62,346,212 landlines. Table 3 shows a comparison between the two surveys.

Table 3
Technical comparison of research

	Face to Face	IVR
Collection period	03/28 to 04/01/2015 - 4 days	29/06 a 03/07/2015 - 4 days
Size	5.009	50.004
Sampling method	proportional stratified	random sampling

According to Costa (1977), a statistical analysis study includes important aspects of kinds of sampling, being necessary to ensure that the sample or samples are obtained by appropriate processes. Thus, it can be said that it is essential to ensure that the sample is representative of the population.

The debate between sampling quotas and probabilistic analysis has existed for more than 60 years (Moser & Stuart, 1953). The applied method, its advantages, disadvantages and how polls are conducted are widely discussed by the academy because the sample type setting is a very important step in defining the research, able to determine the reliability of the results obtained (Voss, Gelman & King, 1995).

Sampling, according to the literature, can be basically divided into probabilistic and non-probabilistic sampling. The first, by following the laws of statistics, allows you to find the sample, population characteristics; while the second depends on criteria and evaluation of research for the development of a reliable sample (Oliveira Almeida, and Barbosa, 2012).

The advantages and disadvantages of the two types is that the non-probabilistic sample is faster and less costly; the probabilistic provides greater reliability of results since each element of the population has the same probability, predetermined, non-zero, to be sampled. Moreover, the probability sampling is possible to draw conclusions that can be generalized to the entire population, which does not happen in the non-probabilistic sample (Oliveira et al., 2012). Another advantage of probability sampling is to estimate the sampling error and the accuracy of the sample obtained, based on the results contained in the sample itself.

Table 4 shows a summary of the advantages and disadvantages of both types of samples.

Table 4
Types of samples comparison

Sampling			
Type	Description	Advantages	Disadvantages
Randon probability Sampling	List population	Precision Estimable error	High cost
Non probabilistic sampling (PPT)	Researcher judgment	Less costly	Error cannot be estimated

Sudman and Blair (1999) consider the sample survey a phenomenon of the twentieth century reaching broad growth from the 1930s with companies that adopted the model by quotas. Doherty (1994) emphasizes the preference for the use of probability sampling since, as shown in theory and previous experiences, the use of other sample shapes can pose risks underlying assumptions are not appropriate, risks that statisticians do not like to have.

Several criticisms are made of research that operates only with the method of quotas (Moser & Stuart, 1953; Doherty, 1994) arguing that they have no scientific basis for their practice by allowing interviewer bias and cannot represent the national population appropriately.

However, authors such as Berinsky (2006) and Gschwend (2005) do not dismiss research on quota sampling and defend the possibility of creating strategies to analyze data from these sample types to ensure its validity, even recognizing possible biases arising from their limitations.

Thus, from two different aspects – the sampling approach and the data collection technique, it was possible to compare the methods and compare the results using a Pearson correlation analysis of the results found in the questions asked by the research.

4 RESULTS

The survey grouped the results according to the size of the municipality studied:

- Small: up to 100,000;
- Medium: 100000-500000 inhabitants;
- Large: over 500,000 inhabitants.

Four tables were prepared using the door-to-door surveys and IVR. They organized results according to the following questions:

- 1) How do you rate the administration of current Mayor?
- 2) How do you feel about the current management of the City Hall?

The application of the door-to-door method revealed the results listed in Tables 5 and 6.

Table 5

Face to face Survey results– P.1

P. 1) How do you rate the administration of current Mayor?	Total	Large Size	Medium Size	Small Size
Great	2,83%	2,85%	2,69%	2,98%
Good	18,65%	18,33%	20,94%	16,30%
Regular	30,04%	30,80%	30,21%	24,45%
Bad	22,82%	23,24%	21,93%	21,67%
Very bad	24,22%	23,07%	23,43%	33,80%
Don't know	1,44%	1,71%	0,80%	0,80%

Table 6

Face to face Survey results– P. 2

P. 2) How do you feel about the current management of the City Hall?	Total	Large Size	Medium Size	Small Size
Well informed	18,27%	19,81%	13,46%	17,10%
Poorly informed	48,53%	48,05%	50,46%	48,11%
Uninformed	31,10%	29,86%	34,49%	33,00%
Don't know	2,10%	2,28%	1,59%	1,79%

The application of IVR method revealed the results presented in Tables 7 and 8.

Table 7
IVR results– P.1

P. 1) How do you rate the administration of current Mayor?	Total	Large Size	Medium Size	Small Size
Great	4,50%	2,98%	2,02%	4,01%
Good	21,22%	19,40%	18,04%	15,11%
Regular	34,86%	31,21%	31,90%	26,95%
Bad	19,56%	20,83%	19,89%	19,85%
Very bad	17,64%	24,05%	24,83%	29,09%
Don't know	2,22%	1,53%	3,32%	4,99%

Table 8
IVR results– P. 2

P. 2) How do you feel about the current management of the City Hall?	Total	Large Size	Medium Size	Small Size
Well informed	14,90%	15,81%	11,69%	17,81%
Poorly informed	53,01%	53,22%	55,83%	51,67%
Uninformed	30,92%	29,98%	31,20%	29,05%
Don't know	1,17%	0,99%	1,28%	1,47%

The cost calculation was carried out according to the total value of each survey, divided by the total valid number of responses. The final result is the comparison of the value obtained from each research method, that in this study is characterized as X factor or price per unit.

As the cost of conducting an IVR represents only a small fraction of the cost of performing a door-to-door survey, this allows researchers to achieve a higher number of respondents and thus decrease the survey error with the same initial budget (Table 9).

Table 9
Cost comparison

(For interview)	Door-to-Door	IVR
Cost (real)	153X	X

In order to evaluate the level of correlation between the two surveys, we used the Pearson correlation coefficient. In this case, both general comparisons as per size of the cities surveyed were made (Table 10).

Table 10
Research correlation

Coefficients	Question 1	Question 2
Total	0,9386	0,9955
Large	0,9942	0,9939
Medium	0,9831	0,9912
Small	0,9786	0,9900

When the coefficient is above 0.9 we say that there is a high correlation. To prove that the coefficient is significant, we used the hypothesis test (Table 11).

Table 11
Hypothesis Test

T _A	Question 1	Question 2
Total	5,4427	21,0098
Large	18,5478	17,9652
Medium	10,7469	14,9501
Small	9,5101	14,0204

The critical value of t for comparisons with 5 %, 2% and 1% significance level are 2.78, 3.75 and 4.60, respectively. As the calculated value is higher than the critical value in all situations and comparisons, we can conclude that there is statistical evidence of correlation values at all significance levels mentioned above.

5 DISCUSSION AND CONCLUSIONS

As remarkable as the high correlation of research results is the cost to perform each. For each real (Brazilian currency) spent on the IVR it was necessary to spend 153 times more on the door-to-door survey.

A review of several studies shows that data collected via telephone are comparable to the data collected through personal interviews (Dickinson et al., 1994).

Although IVR surveying does have its limitations, in this case authors found that the data collection method via IVR, served research needs well.

Initially, the main criticism of the method is due to the fact that it is not possible to know for sure who is actually answering the phone. This limitation may or may not be a problem, depending on the nature of the research in question. To what extent the methodology's limitations may interfere with the results is a good proposal for future research.

We can then consider that the use of IVR method of data collection can be very satisfactory in various research contexts in which the limitations of the method do not compromise the development of intended research. In addition, the IVR method can also be an excellent way to probe or conduct preliminary research. Like all other research engines, the IVR method can also be improved, but it is undeniable that, unlike others, its scope and cost is attractive.

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