

**THE PHYSICAL PRESENCE IN TELEVISION
AUDIENCE DATA**

João Pedro de Lucena

Universidade Lusíada de Lisboa, COMEGI

Joaquim A. Casaca

IADE, Universidade Europeia, UNIDCOM/IADE

Resumo: A Publicidade é uma atividade que fornece valor às marcas através das audiências que consegue alcançar. Quanto maiores forem as audiências geradas pela atividade publicitária, mais impacto têm as marcas nos seus mercados e mais receitas obtêm os meios. A credibilidade dos sistemas de medição de audiências é muito importante para o processo de aferição de valor tanto para os anunciantes como para os meios.

O objetivo deste trabalho é o de conhecer um pouco melhor o sistema digital de medição de audiências televisivas com Identificador de Presença (ID) em painéis fixos de telespetadores. O ID é um equipamento que permite ao sistema de medição de audiências registar a presença física do telespetador junto da televisão.

Para este objetivo compararam-se o número de *zappings* e de tempo médio de visionamento de duas amostras independentes de 330 elementos cada – uma amostra de controlo e uma outra experimental, sobre a qual se entrevistou – retiradas de um painel fixo de medição de audiências constituído por 2328 indivíduos. O grupo experimental foi submetido a uma ação de reforço da perceção da correta utilização do ID tendo essa ação também sido aproveitada para identificar situações de eventual má utilização do ID com o objetivo de corrigi-las. Utilizaram-se os dados de audiência das 24 horas de 10 dias.

Os resultados mostraram não existirem diferenças significativas entre o número de *zappings* e de tempo médio de visionamento das duas amostras, contribuindo dessa forma para reforçar a perceção de que o ID pode ser muito importante para a credibilidade dos dados de audiência em televisão

Palavras-chave: Audiências, Publicidade, Mediação de audiências.

Abstract: Advertising provides value to the brands because it delivers audience. The bigger is the reached audience, the more is the impact of the brands in their markets and the more is the revenue of the operators. The credibility of the process for measuring audiences is crucial for value recognition both for brands and media operators.

The objective of this research is to know a little bit better the audience television measuring digital systems, based on fixed viewers' panels that use a Physical Presence Device (PPD). This device allows the audience measuring system to recognize the physical presence of the viewer next to the TV set.

To achieve this objective it was compared the number of zappings and average time view of two independent samples with 330 elements each - a control sample and an experiment sample - from a fixed panel audience with 2328 individuals. The experimental group was submitted to a reinforcement action to increase the awareness of how to use correctly the PPD. This action was also used to identify eventual incorrect use of PPD and correct it. It was used audience data of the 24 hours of 10 days.

The results show no significant differences between the number of zappings and average time view between the two samples, contributing for the assumption that PPD is an important tool for the credibility of television audience data

Keywords: Audiences, Advertising, Physical presence device (PPD).

1. Introduction

Advertising is a sector that works as an economic activity indicator. Molarini and Turino (2006) found a strong positive correlation between consumption and investment. Along those lines, Fridriksson and Zoeaga (2012) identified solid evidence that advertising is a predictor for economic investment. Between 2003 and 2013 worldwide economy rose about 13% (The Conference Board, 2015), whereas the investment in advertising increased about 60% (WARC, 2015).

Advertising thrives on audiences, and its measurement provides important reference data to establish its price, which can be mostly explained by the dimension of the public reached.

Since television is the mass media with the most worldwide audience, marketers use this tool so that the brands reach vast audiences. On the other hand, television operators try their best to increase their audiences as a way to generate more advertising revenues.

The quality of the measurement and the description of the advertisement audiences is a key factor to ensure that the whole value creation process, both for advertisers and operators, is credible.

This is the investigation field of this paper, whose purpose is to help knowing better a subject with no studies yet: the television audiences' measurement process based on a permanent panel of viewers that use a Physical Presence Device (PPD). The goal is to evaluate the PPD credibility in the audience measurement process, thus contributing to a better understanding of the television audiences' measurement process. The issue which is intended to address is to identify, using the audience measurement system, if the viewer is present in front of the TV set. The question is "How reliable is the system?"

This article is structured as follows: first the literature review provides an overview on the information the audience digital measurement systems make available in the audience behaviour field, followed by the identification of the problem and investigation question. In the following section a research model is presented in order to move on to the data analysis and discussion. The end section includes the conclusions and some clues for further investigation.

2. Literature review

Advertising is an important tool for many companies to assert themselves in its markets and the continuous investment in this commercial communication tool, shows that its importance has been increasing, as seen in Table 1.

Table 1 – Worldwide investment in advertising

Year	All media (10 ⁶ USD)	Television (10 ⁶ USD)	Television (% of all media)
2003	321.109,20	117.329,5	37%
2004	361.292,00	134.254,9	37%
2005	386.446,10	141.857,5	37%
2006	413.425,50	150.347,6	36%
2007	455.331,90	166.314,2	37%
2008	469.059,90	175.838,1	37%
2009	408.428,10	159.781,5	39%
2010	452.926,10	185.019,6	41%
2011	491.918,40	200.661,0	41%
2012	500.922,70	206.991,2	41%
2013	509.291,20	2084.81,9	41%

Source: <http://www.warc.com/NotesOnAdspendData>

The use of digital means to distribute television contents, allows data to be collected using that same technology, at the speed of light. The audience data is collected through granular data collection via set-top-boxes (STB) placed in each device (Kent, Ribert J., 2002) from a sample of viewers that accepted to become a part of a permanent panel. The collection is done automatically. This technology has allowed for many discoveries as well as different types of observations.

Wilbur, K.C. (2008a) observed that the demand by the advertisers for advertising is quite dependant on its price with an elasticity of almost 3. He also noted that for major television operators, a 10% decrease in commercial break's time has led to a 25% average increase in its audiences. This fact raises an issue on the saturation of the commercial breaks.

The issue with commercial avoidance has been a concern for operators and advertisers as well as a topic that digital technology has helped to better understand. Schweidel, D.A. and Kent, R.J. (2010, 2011) state that the gap between the programme's audiences and commercial breaks' audiences (commercial avoidance) can be over 20% and that this behaviour has a higher percentage for reality shows than for drama shows.

In that same article the author confirms that commercial zapping was of about 5%, which is in line with previous studies (Danaher, 1995; Van Meurs, 1998).

In 2011 the same authors reported how audiences rise and fall within the

commercial break suggesting that, based on current technology, advertisers should pay according to the audience generated by their commercials and not by the average of that period. Kent, R.J. (2013) suggests that marketers should pay the unit ratings of their commercials, since the cable or satellite digital technology allows such data to be obtained (Atkinson, 2008).

Wilbur, K.C. (2008b) talks about the threat to advertising audiences which is the widespread use of the Digital Video Recorder (DVR), proposing that the advertising industry should endeavour all efforts to make their commercials even more unexpected and creative in order to battle this tendency.

3. Problem and investigation question

The audience data is collected through granular data collection via set-top-boxes (STB) placed in each device (Kent, Ribert J., 2002) from a sample of viewers that accepted to become a part of a permanent panel. The collection is done automatically. But the fact that STB recognizes that a certain television set is tuned to a certain channel, it does not mean that someone is actually watching TV at the moment.

The viewer might have decided to go to the bathroom or even to take a nap in the bedroom. The observations and conclusions described in the literature review do not contemplate these hypothesis.

The problem of detecting the physical presence of the viewer, so that it can be recorded as audience, is address by the manipulation of a Physical Presence Device by all the subjects in the permanent panel of viewers, which should be turned “on” every time one of the subjects starts watching television and “off” when the subject stops watching it.

This method will only be precise if all the subjects in the panel use the Physical Presence Device correctly. Thus, our purpose is to answer the following question:

- Do the subjects in the panel use the Physical Presence Device correctly, i.e., every time they start and stop watching television?

4. Research model and hypothesis

The research model has been developed based on the hypothesis that the subjects of the audience measurement permanent panel may not always use the Physical Presence Device when they start and stop watching television. If this happens in a statistically relevant way, the data reliability is debatable and it becomes difficult to ascertain the reliability of the Physical Presence Device.

To test this hypothesis, two samples were selected. One with an experimental group and another one with a control group. Both samples belong to a permanent measurement panel that uses the Physical Presence Device.

Each sample is comprised of 330 individuals (for 95% reliability and 5% sampling error). The sampling process used was the stratified random sampling, by gender, age group and distribution proportional to the universe. For each strata, the samples were selected randomly by a simple sampling process. The subjects selected for the experimental group were contacted on the 15th and 16th of September 2015 from 10 am to 8:30 pm.

The experimental group underwent an information session by phone to reinforce the importance of the Physical Presence Device procedures, as described in Box 1. This session was also used to identify misuses and correct them.

Box 1 – Information session

“Marktest Audimetra is conducting a study in the homes that cooperate with the television audience measurement on the use of the audimeter remote control. Only some homes and subjects were randomly selected, and you were one of those people.

We would like you to answer two questions:

Of the list of sentences I will read to you, please select the most appropriate option concerning your use of the audimeter remote control:

A) WHEN YOU START WATCHING TELEVISION

You always press the button in the audimeter remote control	1
You press the button sometimes	2
You rarely press the button	3

B) WHEN YOU STOP WATCHING TELEVISION (or INTERRUPT IT FOR SOME TIME), AND THE TELEVISION IS STILL ON

You press the button to inform you are not watching television	1
You press the button sometimes	2
You rarely press the button	3

Thank you for your reply and would like to remind you that it is very important to use the audimeter remote control, since it is the only way Marktest Audimetria can know exactly who is watching television, at any given time.”

If there are number 2 or 3 answers please HIGHLIGHT THE FOLLOWING RULES:

YOU MUST PRESS THE BUTTON ASSIGNED TO YOU:

- 1 – every time you start watching television.
- 2 – Every time you interrupt it (before leaving the room where the television is on).
- 3 – Every time you resume watching television (e.g. you return to the room where the television is on).

The audience data was collected over the course of ten days, 24 hours a

day, for both groups, so that it was possible to observe and compare the number of zapping and the average viewing time for both the experimental and the control groups. If the hypothesis that the PPD is being used incorrectly by the members of the panel is correct, then there will be a statistically significant difference between both samples concerning the average viewing time and number of zappings.

Software IBM SPSS Statistics, version 22, was used to carry out the statistical analysis.

5. Data collection method

The data collection was carried out with the help of Marktest Portugal's audience panel. This panel is comprised of 2.328 subjects divided by 900 homes, located in Mainland Portugal (excluding the Azores and Madeira islands). This sample represents the behaviour towards television of 9.684.300 individuals in Mainland Portugal (2001 Census).

All the television sets that are always kept in the same place or moved slightly, used at least once a week in each of the panel homes, as well as all the audio-visual equipment associated, are controlled by an electronic device called an audimeter. This device records the tuned channel for each television set and send the information to the main computer.

All the family subjects inform of their presence by a remote control (the Physical Presence Device), which as a button associated to each family member. Throughout the day, for 24 hours starting at 2:30 am, the audimeter records the audience information for each family member, saving it in its memory. During the night, the information concerning each home is downloaded automatically via a modem to the data processing centre at Marktest Audimetria. This Physical Presence Device registers if the subject is watching television or not and sends the information to the main computer. The sample subject is only recorded as audience if the computer receives the information that the television set is on and the sampling subject is present.

The audience data regarding the study universe (2.328 subjects) was collected between the 20th and the 30th of September 2015. The information collected is structured according to box 2.

Box 2 – Information structure

Item	Description
Date	Date when the data was collected
Home	Identification of the home
Ind	Individual identification of each element in the household

Region	Identification of the geographical region in Portugal
Social class	A/B/C1/C2/D
Gender	Female/ Male
Age	Age (category variable)
Channel	Channel being watched
Since	Viewing starting time (hh:mm:ss) (by channel)
Until	Viewing finishing time (hh:mm:ss) (by channel)
Duration	Duration of each viewing (by channel) in seconds

The statistics techniques used in this study are supported by two quantitative variables created based on the information in Box 2:

- Variable Duration – represents the total viewing time measured in seconds per sample subject;
- Variable Zapping – represents the numbers of zapping (channel changes) carried out by each sample subject.

6. Results analysis

In order to analyse the effects to the information session on the correct usage of the Physical Presence Device between the control group (CG) and the experimental group (EG), variables *Duration* and *Zapping* were used.

Variable *Duration*

The significance of the gap between the average television viewing times of the control group and the experimental group that underwent the information session on the correct use of the audimeter was evaluated using the t-Student test for independent samples.

The assumptions of this statistical method, namely the normal distributions, were evaluated with the Kolmogorov-Smirnov test ($KS(330)_{EG} = 0,147; p < 0,001$; $KS(330)_{CG} = 0,141; p < 0,001$) and the Levene test based on the mean ($F(1,658) = 0,361; p = 0,548$).

Even though the dependent variable does not present a normal distribution for any of the groups (Table 2), the t-Student test has been considered robust to the violations of the normality assumption when the skewness ($sk_{EG} = 1,038$; $sk_{CG} = 1,085$) and kurtosis ($ku_{GE} = 1,072$; $ku_{CC} = 0,827$) values are not too high and the sample is large ($n > 30$).

The gap between the averages is considered statistically relevant when the *p-value* of the test is inferior or equal to 0,05.

Table 2 - Normality tests for the variable *Duration*

Group	Kolmogorov-Smirnov			Skweness		Kurtosis	
	Statistics	Gl	Sig	Statistics	Standard error	Statistics	Standard error
Experimental	0,147	330	0,000	1,038	0,134	1,072	0,268
Control	0,141	330	0,000	1,085	0,134	0,827	0,268

Even though the average viewing time is different for both groups (13.134,18 seconds for the control group and 13.240,18 seconds for the experimental group) the difference is not statistically significant ($t(657) = -0,110$; $p = 0,913$), for a significance level of 5% (Table 3).

Table 3 - Descriptive statistics and independence test

Group	Descriptive statistics			Independence test		
	N	Mean	Standard error	t	Gl	Sig.
Experimental	330	13 240,18	12 614,37	-0,110	657	0,913
Control	330	13 134,18	12 224,12			

Variable Zapping

The hypothesis that there was no gap between the distribution of the number of zappings for both groups was evaluated using the non-parametric Wilcoxon-Mann-Whitney test for independent samples.

This test was used based upon the fact that the assumption of normality for the zapping variable in both groups ($KS(330)_{EG} = 0,264$; $p < 0,001$; $KS(330)_{CG} = 0,225$; $p < 0,001$) was not met and the skewness ($sk_{EG} = 3,264$; $sk_{CG} = 2,859$) and kurtosis ($ku_{EG} = 14,249$; $ku_{CG} = 11,068$) values were too high (Table 4).

Table 4 - Normality tests for the variable *Zapping*

Group	Kolmogorov-Smirnov			Skewness		Kurtosis	
	Statistics	Gl	Sig	Statistics	Standard error	Statistics	Standard error
Experimental	0,264	330	0,000	3,264	0,134	14,249	0,268
Control	0,225	330	0,000	2,859	0,134	11,068	0,268

The gap between the distribution of the number of zapping for both groups is not statistically significant ($U = 52813,5$; $W = 107428,5$; $p = 0,502$), for a significance level of 5% (Table 5).

Table 5 – Descriptive statistics and Man-Whitney test

Group	Descriptive statistics		Man-Whitney test	
	N	Mean rank	Statistics	Sig.
Experimental	330	325,54	52.813,50	0,502
Control	330	335,46		

Insert Table 5 here

7. Conclusions and further investigation

The investigation question was if the members of the panel used the Physical Presence Device correctly, i.e., when they start and stop watching television. The answer is yes, the members of the panel do use the Physical Presence Device correctly when they start and stop watching television. In fact, the results presented do not confirm the hypothesis that the Physical Presence Device is being used incorrectly since there are no statistically relevant differences in the number of zappings and the average viewing time between the experimental and the control groups.

If there were significant differences in these indicators that would mean that the system was not reliable (the subjects had become remiss in using the Physical Presence Device). That would also mean that the information session would have had a statistically significant effect in the audience ratings and that the panel did not work properly with the Physical Presence Device.

Since there were no significant differences in the average viewing times and zapping, one can conclude that the Physical Presence Device was being correctly used and it is an instrument that contributes to the reliability of the audience data. This observation will help value the importance of using a Physical Presence Device to improve the quality of the audience data.

To better understand how the Physical Presence Device improves the reliability of the data it is important to obtain data without the Physical Presence Device being used so that they can be compared to the data gathered when the Physical Presence Device is actually being used.

This article proves that the sample taken from a panel of viewers that works with Mediamonitor/Marktest in Portugal is properly using the Physical Presence Device. However, it does not supply any information on the quality control method used that allows for this reliability. Thus, it is not possible to guarantee that a different panel of viewers using the Physical Presence Device is doing it correctly.

In advertising, more than knowing that the audience ratings are from viewers that are physically by the television sets, it matters to know which viewers receive, in fact, the message being conveyed by the television advertisements. The physical presence of the viewer on its own does not guarantee that his attention is focused on the television. And this is a research problem with a wide field of investigation.

Bibliography

- <http://www.warc.com/NotesOnAdspendData> (accessed September, 2, 2015).
- The Conference Board. 2015. The Conference Board Total Economy Database™ , May 2015, <http://www.conference-board.org/data/economydatabase/>.
- ATKINSON, Claire. 2008. How commercial ratings changed the \$70B TV market. Advertising Age, Commercial-Ratings White Paper.
- DANAHER, Peter J. 1995. What happens to television ratings during commercial breaks? *Journal of Advertising Research* 35, no. 1: 37-47.
- FRIDRIKSSON, K.S. and ZOEAGA, Gylfi (2012) Advertising as a predictor of investment. *Economics Letters* 116 (1), pp. 60-66. ISSN 0165-1765.
- HERNANDEZ, J., LIU, Z., HULTEN, G., DEBARR, D., KRUM, K., & ZHANG, Z. (2013). Measuring the engagement level of TV viewers. In *Automatic Face and Gesture Recognition (FG)*, 2013 10th IEEE International Conference and Workshops on (pp. 1-7). IEEE.
- KENT, Robert J. (2002), Second-by-Second Looks at the Television Commercial Audience, *Journal of Advertising Research*, Jan_Fev2002, 71-78.
- KENT, Robert J. (2013) Switching before the pitch: Exploring television channel changing before the ads even start, *Journal of Marketing Communications*, 19:5, 377-386, DOI:10.1080/13527266.2012.671188
- MOLINARI, B. and TURINO, F. (2009). Advertising and Business Cycle Fluctuations, Working Paper WP - AD2009-09, Ivie, <http://Ivie.es/indexb.php?idioma=EN>
- SCHWEIDEL, David A., KENT, Robert J., (2010), Predictors of the Gap Between Program and Commercial Audiences: an Investigation Using Live Tuning Data, *Journal of Marketing*, Vol. 74, (May2010), 18-33
- SCHWEIDEL, David A., KENT, Robert J., (2011), Introducing the Ad ECG- How the Set-Top Box Tracks the Lifeline of Television, *Journal of Advertising Research*, (Jun 2010), 586-593, DOI : 10.2501/JAR -51-4-586-593.
- VAN MEURS, Lex. 1998. Zapp! A study on switching behavior during commercial breaks. *Journal of Advertising Research* 38, no. 1: 43-53.
- WILBUR, Kenneth C., (2008a), A Two-Sided, Empirical Model of Television Advertising and Viewing Markets, *Marketing Science*, Vol.27, N.3, May-June2008, pp.356-378.
- WILBUR, Kenneth C., (2008b), How Digital Video Recorder (DVR) Changes Traditional Television Advertising, *Journal of Advertising*, Vol.37, Spring 2008, pp.143-149.