

# An approach to the implementation of neuromarketing techniques by European private TV broadcasters

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## Abstract

Changes on media context urge companies to adopt alternative and innovative strategies for decision-making regarding audience's habits and preferences. In this respect, the neuroscience methodology provides an appealing option to analyze consumers' viewing experience. This paper aims to determine the impact of neuromarketing on TV channels for the latter purpose, through an in-depth review and a survey addressed to analyze the use of this methodology by European private broadcasters. The results achieved point to the potential of neuromarketing to improve efficacy of linear and non-linear TV commercial spaces, as well as to design television contents and to optimize the impact of social TV and multiscreen viewing.

## Keywords

Neuromarketing; Private broadcasters; Television; Entertainment industry; Neuroscience; Europe; Media; Audience; Habits; Consumers; Strategies; Decision making; Impact; Optimization.

## 1. Introduction

Audience data has always been the core of broadcaster business. Traditionally, TV channels have made decisions based on demographic, geographical and time-based information. This has been until now, but cognitive neuroscience has changed media research perspectives. Neuroscientific studies have demonstrated the predominance of emotion in decision-making by revealing unconscious emotional processes in the lead of our choices (Bechara; Damasio, 2004). This discovery has driven new paradigms to approach social sciences and media research (Bagozzi; Gopinath; Nyer, 1999) and provoked the emergence of interdisciplinary fields such as neuromarketing.

Neuromarketing is the application of neuroscientific methodologies to study humans in relation to market stimuli (**Fugate**, 2007). It emerges from the combination of neuroscience, cognitive psychology and marketing, and aims at identifying the correlation between Central (**Fugate**, 2008) and Peripheral Nervous System activation to commercial inputs (**Santos et al.**, 2015). Its methods help to refine individuals' behavior since they identify introspective cognitive and emotional processing implicated in preferences (**Bechara; Damasio**, 2004; **Vecchiato et al.**, 2011) and eliminate the recall bias observed in traditional research (**Falk et al.**, 2010).

Entertainment industry is highly aware of the role of emotion in content designing and its ability to attract attention, entertain, persuade and be remembered (**Bolls; Lang; Potter**, 2001). Neuromarketing considers the neurophysiologic reactions to design and predict responses to communication stimuli (**Bell et al.**, 2018; **Harris; Ciorciari; Gountas**, 2018; **Hakim; Levy**, 2019) that could lead to greater effectiveness on companies' managerial actions. Previous research analyzed the adoption of neuromarketing methodologies by the Spanish broadcasters and by the European public media (**Crespo-Pereira; Martínez-Fernández; García-Soidán**, 2016; **Crespo-Pereira; Martínez-Fernández; Campos-Freire**, 2017). Then, the current study offers an exploratory study in the lacking private European sector.

## 2. Methodology

This paper provides a preliminary analysis on a trendy phenomenon observed among worldwide private broadcasters, namely, the implementation of consumer neuroscience methods to study audiences. This research is composed of two parts. In the first one, an in-depth review about the scope of neuromarketing on broadcasters is provided from peer-reviewed articles indexed in the academic data bases: *Scopus* and *Web of Science*, and the publisher *Emerald*. Articles were selected by using the keywords 'Neuroscience' AND 'Television'; 'Neuromarketing' AND 'Television'. Given that broadcasters' commissioned studies are unusual in academic journals (**Fischer; Chin; Klitzman**, 2010), a complementary search was carried out in the data base *Warc* and in neuromarketing consultancies' websites. A total of 59 articles and documents were selected, encoded and classified.

The second part of the study analyzes, through an empirical research, the implementation of neuroscientific techniques by European broadcasters. Neuromarketing experts from European countries report about the impact of this innovative methodology in the entertainment industry. With this aim, a personal survey was addressed to specialists selected from the *International Neuromarketing Science & Business Association (Nmsba)*, as this procedure was validated (**Pop; Dabija; Iorga**, 2014). Given the existence of the previous research (**Crespo-Pereira; Martínez-Fernández; García-Soidán**, 2016; **Crespo-Pereira; Martínez-Fernández; Campos-Freire**, 2017), the Spanish consultancies and the European public broadcasters were excluded from this study. Then, from the remaining 33 consultancies, a panel of 14 experts agreed to collaborate in this research, distributed by country as follows: Germany (4), United Kingdom (2), Italy (2), Finland (1), Belgium (1), Denmark (1), France (1), Romania (1) and Netherlands (1) (Table 1).

The data were collected through online self-report questionnaires, designed from the basis of the above mentioned previous similar studies in the Spanish and European setting. A Likert scale, ranging from 1 to 10 (1=completely disagree, 10=completely agree), was selected for the responses to more than 30 questions for assessment on various issues. Additional open questions were included, to allow the experts to clarify their responses. The *Excel* program provided analytical and graphical results.

## 3. Results

### 3.1. Neuromarketing studies driven by international private broadcasters

Neuroscience techniques point to an intimate relationship between the presentation of audiovisual stimuli and neurobiological content processing in real time that would result in better knowledge of audience's preferences (**Fugate**, 2007; **Treutler; Levine; Marci**, 2010). It helps to provide basic rules to elicit high levels of emotion, attention, memory, affections and understanding (**Lang et al.**, 2000; **Lang; Potter; Grabe**, 2003) that leads into creative decisions based on neurophysiologic responses to reduce failure (Table 2).

Consumer neuroscience is encouraging entertainment industry to create their own labs to explore cutting-edge equipment in the study of consumer behavior. *Nielsen* has acquired *Neurofocus* (2011) and *Innerscope* (2015) to create *Niel-*

Table 1. Panel of neuromarketing experts

Expert	Company
Mév Bertrand	<i>Neuro-Insight</i> (United Kingdom)
Duncan Smith	<i>MindLab</i> (United Kingdom)
Arnaud Petre	<i>Brain Impact</i> (Belgium)
Dr. Thomas Zoëga Ramsøy	<i>Neurons Inc.</i> (Denmark)
Philipp Reiter	<i>Eye Square FmbH</i> (Germany)
Jarkki Kotola	<i>Exakti Intelligence Oy</i> (Finland)
Dr. Simone Benedetto	<i>TSW</i> (Italy)
Ana Iorga	<i>Buyer Brain</i> (Romania)
Dr. Roeland Dietvorst	<i>Alpha.One</i> (The Netherlands)
Non identified experts	<i>Incore GmbH</i> (Germany)
	<i>Ottosunove</i> (Italy)
	Non identified consultancy (Germany)
	Non identified consultancy (Germany)
	Non identified consultancy (France)

sen Consumer Neuroscience and become the largest neuromarketing solution organization (Nielsen, 2011; 2015). Time Warner partnered with Innerscope (Innerscope Research, 2014) to set up Time Warner Medialab which aims at testing consumer engagement across several technology and distribution platforms. Many international media groups, such as Time Warner, CBS, A & E, Cartoon Network, ESPN (Babu; Vidyagar, 2012; Innerscope Research, 2014; Singer, 2010), Channel 7, Channel 9, Channel 10, Vevo, Fox Entertainment Group and Turner Broadcasting have invested on neuromarketing research.

Literature review reveals three types of products tested with neuromarketing methodology:

- a) TV shows and their promotional campaigns (Table 2),
- b) advertising spaces (Table 3),
- c) social TV and multi-screening viewing experience (Table 4).

Neuromarketing methods are highly interesting for broadcasters due to their capability to provide creativity insights at early stages of concept development and to determine which aspects elicit audience’s best unconscious emotional engagement and attention (Table 2). Entertainment events and pilots are the main TV contents tested with neuromarketing methods, however, the test of TV-show promotional campaigns seems to have a greater presence (Table 2).

Table 2. TV content studies driven by private broadcasters

Broadcaster / practitioner	Research	Main results	Techniques	Source
Spike TV / Not specified	Viewing preferences of multicultural audience demographics over TV content	Humor, suspense, action, relatable situations and displays of skill are engagement factors to all kind of cultures. Differences over audience segments are shown.	Not specified	Warc, 2017
Spike TV / Neuro-Insight	TV-show campaign efficacy	Neuroscience structured TV-show promotional content achieving an optimal emotional engagement and long term memory on the scheduling information.	Brain activity (not specified)	ARF, 2016
Spike TV / Neuro-Insight	Emotional experience during TV show viewing.	It determined the most engaged moments of the show and revealed key aspects to attract audience.	Biometrics (heart rate, respiration, motion, skin sweat)	Cablefax Staff, 2011
CBS / Neurofocus	TV show campaign and pilots and new shows efficacy	Not specified	Not specified	Penenberg, 2011; Consumer 360, 2012
The Weather Channel / Not specified	TV promotional pitches for a series	Not specified	Not specified	Babu; Vidyagar, 2012
Viacom Media Networks / Not specified	Programming and marketing content	Not specified	Not specified	Innerscope Research, 2014

Most advertising models rely on exposition and attention as the previous step to influence emotional and cognitive responses and, therefore, memory and purchase behavior (Woltman-Elpers, 2003). An optimal visibility and impact of marketing stimuli on audience is considered critical for broadcasters’ revenues. Many of the research elicited by private broadcasters is focused on this matter. Literature review indicates research is mainly centered on developing efficient strategies for linear and convergent commercial spaces to achieve a better return on investment for advertisers (Table 3).

The measure of audience’s involvement with commercial messages might become an indicator of advertising rates (Zurawicki, 2010). Private media companies have approached neuromarketing methods to demonstrate the advantages of advertising on television in collaboration to other media (Fugate, 2007). Their methods enable channels to dig into the benefits of contextual advertising (Zurawicki, 2010). Contextualized and integrated ads on TV shows are proved to get high levels of engagement and recall in audience (Trentler; Levine, 2010). In this respect, ad formats testing and their impact on viewers are usual issues addressed by sport channels (Table 3).

New TV viewing experiences, encouraged by modern technologies (DVR, 4K and Virtual Reality), have promoted studies around their impact in advertising spaces. Neuromarketing helps to structure efficient storytelling in Virtual Reality scenarios for commercial purposes and to determine the impact of 4K television in terms of arousal, attention and engagement. DVR (designed to skip ads) is in the spotlight of commercial and academic research to provide implementable tips into commercial content design. Recent

“ The measure of audience’s involvement with commercial messages might become an indicator of advertising rates ”

studies conclude that ad stimuli are processed unconsciously during flash-forward (**Bartelme, 2012; Siefert et al., 2008**) and low emotional spots are 25% more likely to be flash-forwarded (**Zurawicki, 2010**).

Table 3. Neuromarketing studies: television as a commercial space

Broadcaster	Research	Main results	Techniques	Source
Warner Bros / Innerscope Research	Integrated advertising on TV shows	TV content can stimulate ads engagement. Engagement is higher when rousing curiosity, consumer benefit data is provided, and the message is integrated in the jokes and stories on the show.	Not specified	<b>Treutler; Levine; Marci, 2010</b>
Turner Broadcasting / Innerscope Research	Contextualized advertising	Ad engagement is higher when contextualized shows.	Not specified	<b>Treutler; Levine; Marci, 2010</b>
CBS / Not specified	Media planning and efficacy	Not specified	Not specified	<i>Consumer 360, 2012</i>
A&E / TelevisionNeuroFocus	Contextualized advertising on TV content	Not specified	Neurological reactions	<b>Penenberg, 2011</b>
Turner Broadcasting	Ads design efficacy while sport competition broadcasting	Customized and same creative designs ads are more engaging than non-customized and different design ads.		<i>Warc, 2016</i>
Fox Sports / Innerscope Research	Double box ad format efficacy during sport competition broadcasting	Engagement enhances the interaction between the viewers and the ad. Double box format is processed below conscious awareness.	Biometric and eye-tracking	<i>Innerscope Research, 2014</i>
ESPN / NeuroFocus	Graphic design efficacy on ads and sponsors	Not specified	Not specified	<b>Penenberg, 2011</b>
Television Bureau of Canada / Innerscope	Emotional response to advertising on different media (TV, online, radio, press)	Ads take advantage of immersive and emotional TV content.	Biometric and eye-tracking	<b>Treutler; Levine; Marci, 2010</b>
Time Warner / Nielsen	Impact of advertising and TV shows on a virtual reality context.	This study revealed key aspects to virtual reality efficient storytelling.	Eye-tracking, EEG and biometrics	<b>Swant, 2016</b>
MTV / Neurosense	Viewers' engagement with MTV	MTV is more engaging than other media brands. Multi-platform has high impact on positivity and emotional engagement that benefit brands. Responses came from 10 countries.	Online implicit association test and face trace analysis	<i>Warc, 2015</i>
Currys, PC World, BT Sport, M&C Saatchi / Sensum	Impact of 4K in sport viewing experience	4K produces higher arousal than HD. Replay on 4K registers more attention levels than on HD. Engagement in HD strongly depends on the team performance whereas 4K is less dependent on this element. Replays hold more audience attention in 4K.	GSR	<i>Sensum, 2016</i>
NCB Universal / Innerscope Research	Advertising processing during fast-forwarded viewing	Audience processes images on a non-conscious level from flash-forwarding. Viewers are on alert and focus in the center of the screen when flash-forwarding and ad recall is significantly high.	Biometric and eye-tracking	<b>Siefert et al., 2008</b>

Social TV and second screens are called to define new broadcaster business models (**Treleven-Hassard et al., 2010**). Private channels have promoted neuroscience-based-research to analyze social TV and multi-screening devices under two main goals, optimizing viewing experience and determining the benefits of cross-platforms synergies in advertising (Table 4).

Table 4. Social TV and multi-platform studies driven by private broadcasters

Broadcaster and practitioner	Research	Main results	Techniques	Source
<i>Fox Broadcasting Company / Innerscope Research</i>	Immersive platforms affect engagement with novel and familiar brand and synergy between cross-platforms and brand associations.	Immersive TV context produces lasting emotional connections that benefits brands. Incorporating elements of the TV content in the online context can increase the level of engagement in online ads.	Biometrics, eye-tracking	<b>Steele et al., 2013</b>
<i>Turner Broadcasting / Innerscope Research</i>	Influence of social TV on millennials	Social TV drives more emotional engagement on linear TV than solo TV viewing. TV engagement increases by complementing TV content with social media and apps.	Biometrics, mobile eye-tracking	<i>Innerscope Research, 2014</i>
<i>Seven Network / Neuro-Insight</i>	Social media impact on TV viewing	Multiscreen encourages high levels of engagement and long-term memory that ads would benefit.	Steady state topography	<b>Pynta et al., 2014; Seixas et al., 2015</b>
<i>CNN / Innerscope Research</i>	Advertising impact of recommended news in online context	Friend recommended stories on social media are five times more engaging than non-recommended ones. Recommended stories engage more positively to the message and to associated ads than non-recommended ones.	Biometrics	<b>Bartelme, 2012; Nielsen, 2016.</b>
<i>Turner Broadcasting / Innerscope Research</i>	Second screen sync apps' attention and emotional engagement to programming and advertising	Attention drops during commercials. The optimization of the two-screen experience depends on integrating ads in the program content.	Biometrics and eye-tracking	<b>Aversano; Marsh; Shalhoub, 2014</b>
<i>Innerscope Research commissioned study by an anonymous client</i>	Ad efficiency in different devices and social media	There is a positive synergy between linear TV and social TV for advertisers. TV ads impact better than solo social media. Facebook ads engage four times less than on TV, therefore, the recall is lower. The size of the screen is related to advertising efficacy. Ads must be designed specifically to different devices. Visual attention is related to screen size and is more difficult to achieve in smaller screens. Emotional peak should be in the first few seconds in small screens.	Biometrics, eye-tracking and traditional surveys	<i>Innerscope Research, 2015</i>

### 3.2. Presence of neuromarketing research by European private broadcasters

Advertising efficacy is critical for broadcasters (*TF1 Publicité, 2015*), especially in Europe, where neuroscience methods and teams have been incorporated to impulse content and advertising efficiency. *TF1 Publicité*, the commercial division of the French *TF1*, has incorporated cognitive science to study memory in the advertising scenario (**Bénilde, 2016**) and counts with specialized neuropsychology consultants (**Cohen, 2005**). Also, *TF1 Publicité* and *Canal+* benefit from TV ad efficacy neuroscience studies encouraged by the French *Syndicat National de la Publicité Télévisée (Snptv, 2003; 2005)*.

In Italy, *Mediaset's RTI Interactive Media Department* is composed of psychologists to offer an innovative connection with audience and social media (**Pratesi; Mattiacci, 2015**). This department has financed studies with the consultancy *Brain2Market* to measure the level of attention, emotion and usability on interactive screens (*Brain2Market, 2016*). *Mediaset Spain* has studied the emotions triggered by prime time TV series pilots in order to optimize their products and *Atresmedia* to gain advertising effectiveness (**Crespo-Pereira; Martínez-Fernández; García-Soidán, 2016**). The German *ProSiebenSat.1 Mediagroup* uses consumer neuroscience to design TV contents to reduce economical risks (*Marktforschung, no date*). *RTL Klub (Synetiq, n.d.)* and *RTL Nederland (Crunchbase, n.d.)* have also made use of these techniques.

*ITV* has applied neuroscience to demonstrate the benefits of maintaining a regular brand presence on programs (*Neurosense, n.d.*). *Channel 4* is financing academic research to gain viewer insights in the advertising context and product placement (*Thinkbox, 2015; Oakes, 2016*), whereas *GMTV* to compare viewers' advertising receptiveness in the morning versus prime time hours to find persuasive arguments to sell commercial spaces (**Haq, 2007**). New TV platforms have arisen a discussion of how neuroscience might help to managerial actions. Given the lack of studies around video on demand (VOD) platforms, *Channel 4* has pioneered investigations about key aspects for advertising industry such as memory (**Ellis; Greenbank, 2015**).

Primary research is described next. According to the consultants' opinion, neuromarketing research is believed to have less implementation in their own countries (mean-3,7 and standard average-2,1), than across Europe (mean-4,6 and standard average-2,1). The data from the latter variable, disaggregated by country, are plotted in Figure 1. Denmark and United

Kingdom achieve the highest rates, whereas a low implementation is observed in Italy and Romania. Northern broadcasters tend to be more receptive to neuromarketing research than the remaining European countries.

Few neuromarketing consultancies have TV networks as clients, 57,1% of them do not provide services to broadcasters and those offering them are mainly focused on national private (42,9%) and public broadcasters (35,7%) (Figure 2). Services to private broadcasters represent the 9,3% of their total volume of work, although some dispersion is observed among the participants (standard deviation of 11%).

*TV2 Norway, TV2 Denmark, Pro7Sat1 or ITV* are among the European private companies that have incorporated neuroscience techniques. The consultancies contacted confirmed that they also provide public corporations with their services, where they observe a similar pattern by country. Public organizations using this methodology include the following ones: *Danish Radio, Norwegian Broadcast Company, ARD, ZDF, BBC and Channel 4*.

The lack of awareness of neuromarketing and its benefits (6,9) and the fear to try (6,6) configure the main barriers to implement this methodology by European broadcasters (Figure 3). Neuromarketing is mainly used to improve commercial spaces efficacy (5,9), although its capability to create better entertainment content is also valued (5,1). The current employment of neuromarketing relies on the innovative nature of some private broadcasters (5,4), which can encourage other media companies to integrate these methods in a near future (5,3). Consumer neuroscience still needs to develop and consolidate its know-how in the entertainment industry field. Experts point out some limitations as the lack of knowledge on their performance or the interpretation of the resulting data (4,9). The opaque nature of commercial studies makes it difficult to share a feedback that would enrich research. There is a full agreement that ethics and the existing number of neuromarketing consultancies do not prevent broadcasters from using these methods.

Big data provide channels with significant demographic, geographic and psychographics audience's insights. However, its appearance should not affect neuro-based-research since alternative methods will not necessarily give a better value for money than neuromarketing. Indeed, this research can reveal hidden information from consumers, generalizable to a larger population.

“ Experts point out some limitations as the lack of knowledge on their performance or the interpretation of the resulting data ”

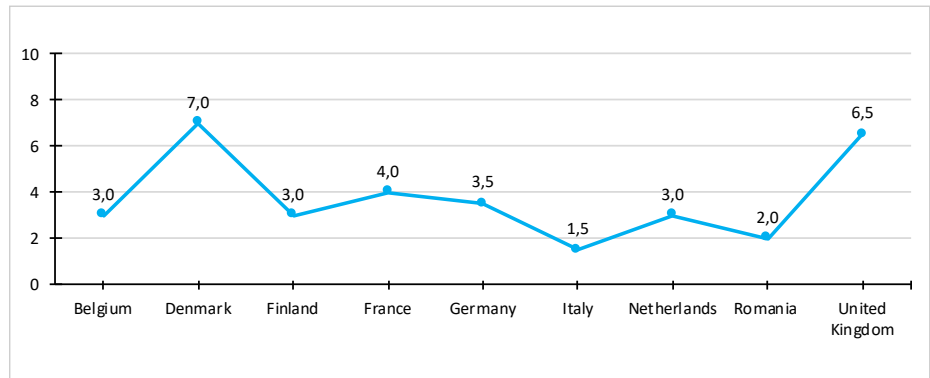


Figure 1. Assessment of the introduction of neuromarketing techniques by private broadcasters

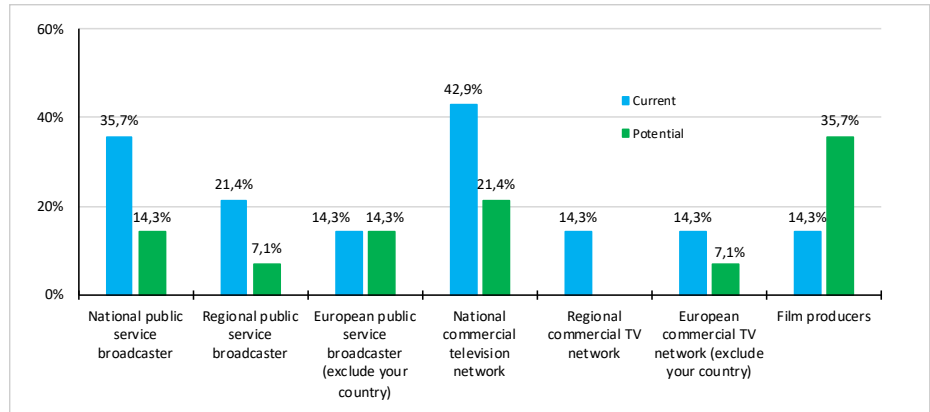


Figure 2. Neuromarketing consultants' customers

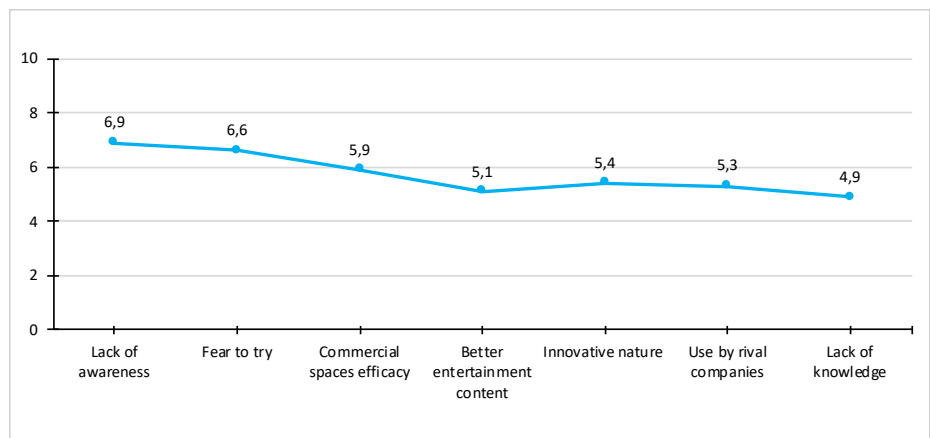


Figure 3. Assessment of motivations for the current introduction of neuromarketing by private broadcasters

European private broadcasters finance most studies to increase the efficiency of advertising spaces (57,1%) and to optimize entertainment programs (28,6%) (Figure 4). Foreign TV series, films and documentaries are analyzed on a smaller scale. Neither informative nor educative contents have been tested by private broadcasters.

European private broadcasters finance most studies to increase the efficiency of advertising spaces and to optimize entertainment programs

Methodological design determines the cost of studies. Consultancies adopt the most varied techniques under the umbrella of neuromarketing (Figure 5). The most used technique is electroencephalography (EEG) (50%), which monitors electrical brain activity (Vecchiato *et al.*, 2011), and eye-tracking (ET) (42,9%) that tracks visual patterns to provide information related to individuals' attention. Both are usually employed together since ET allows companies to determine what particular stimulus is producing a certain neural activation.

The use of neuromarketing by broadcasters is increasing positively and it seems this trend is kept in the near future. However, its level of introduction will clearly determine how well or poorly the market research is performed on TV field. Eventually, neuromarketing will rely on cost and benefits to the entertainment industry.

In the mid-term (5 years), the use of neuromarketing research is expected to become more common among media. The professionals trust on the increment of neuroscientific studies in their respective national markets (mean of 7,1) and on the remaining European countries (mean of 6,8). In their opinion, neuromarketing is not a temporary trend and the main arguments supporting this assertion are summarized in Figure 6.

85,7% of the experts consider that neuromarketing will be widely known among broadcasters in a five year-period and will improve its ability to provide better information, entertainment and educative TV content. The use of these techniques by rivalry companies seems to be an encouraging factor for their application (71,4%). Also current technology and data interpretation limitations will be overcome in a near future (57,1%) and other techniques such as big data will fail to provide cheaper or more useful techniques

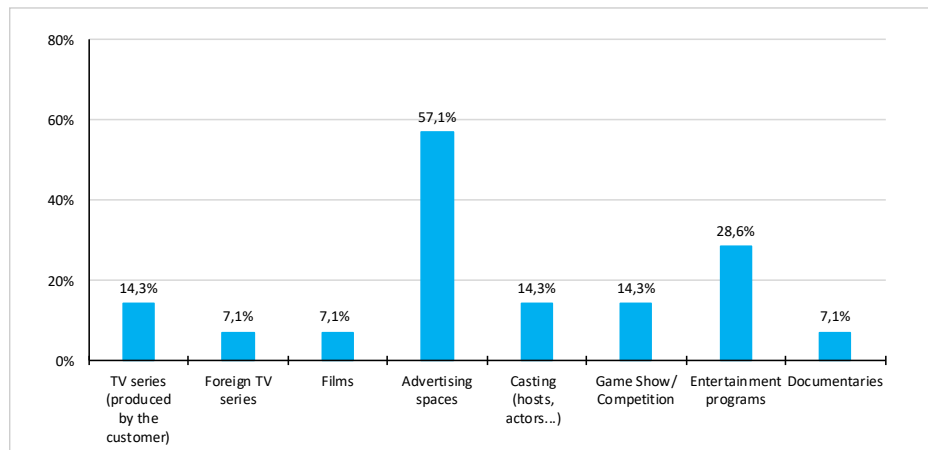


Figure 4. Type of content analyzed through neuromarketing techniques

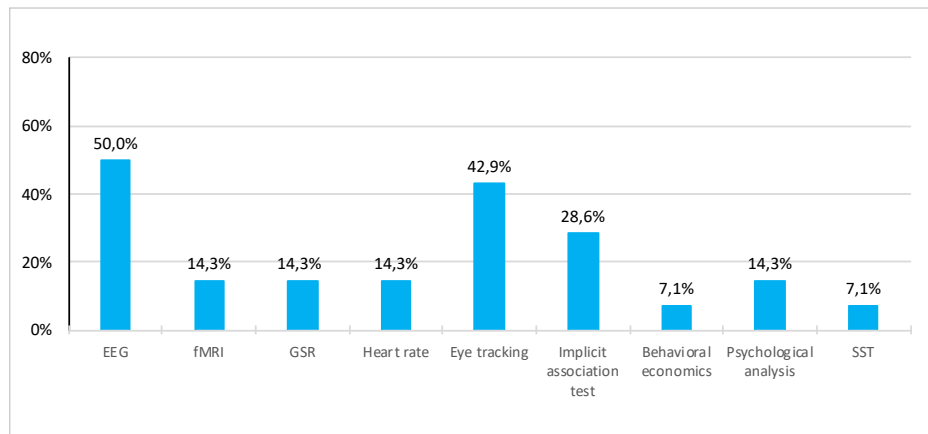


Figure 5. Neuromarketing techniques used to analyze the content

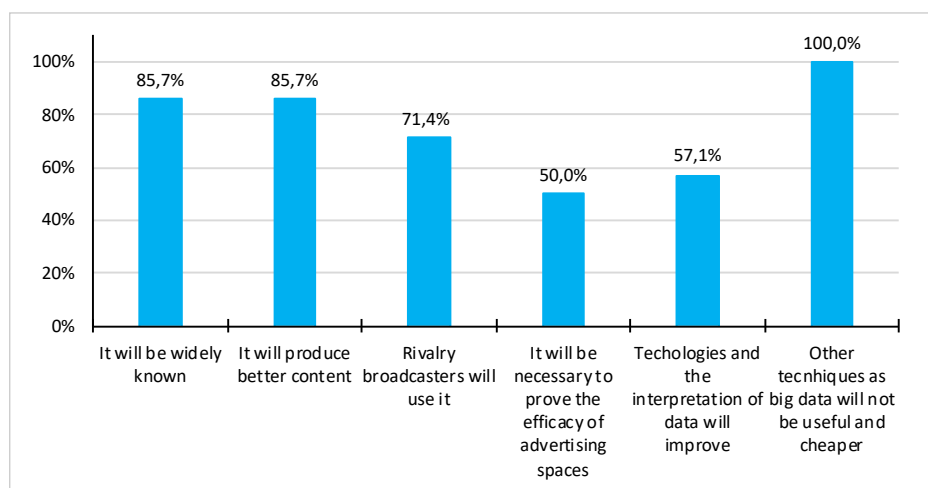


Figure 6. Arguments supporting the future application of neuromarketing techniques



than neuromarketing in the following years (100%). This methodology will be needed to prove TV commercial spaces efficacy (50%).

#### 4. Conclusions

The competence of the media scenario leads to a better understanding of the audience. Neuromarketing offers an alternative formula to explore the audience's attention, memory and emotion to audiovisual stimuli that would lead to optimize the managerial actions of broadcasters and the return on investment for advertisers.

The main focus of neuroscience-based research by private worldwide broadcasters lies on gaining efficacy on linear commercial spaces through the impact of ad formats and on new multi-platform experiences. Neuromarketing itself has become a persuasive argument to sell ad spaces and prove channels' commitment to the advertising industry.

It is important to note that previous research was developed on the implementation of neuromarketing methodology in the private sector, but restricted to Spanish broadcasters. Then, the current study extends its scope to other European countries, although some limitations must be mentioned. Mainly, the reduced sample (14) achieved, due to the small size of the universe of experts in the private industry who agreed to share their strategies. In consequence, only exploratory tools were applied to analyze the participants' responses, collected from more than 30 questions.

One conclusion of the current study is that financed neuromarketing research is developed in Europe, in almost a dozen private channels and at least six public broadcasters. Only a few consultancies have private and public broadcasters as clients and its volume of work remains low when compared to other industries such as advertising. Research is primarily addressed to analyze advertising efficacy, whereas a second objective becomes the optimization of entertainment content, mainly prime time TV series and films. Neither informative nor educational products have been tested by private broadcasters.

Since methodological design determines the cost of studies, EEG and eye-tracking are among the most employed techniques, for their affordable cost of commercial devices and their manageable performance. However, these tools need to overcome some barriers affecting technical issues and data interpretation, which are expected to be surpassed in the near future, due to the technical improvement and the development of a know-how in the entertainment field. Big data is claimed not to affect neuro-based-research since they do not necessarily offer a better value for money.

The future implementation of neuromarketing in the private industry seems to be strongly dependent on its effectiveness to accomplish broadcasters' demands and to increase their business profits. In this respect, exploiting the potential of neuromarketing to reveal hidden information from audience becomes the cornerstone.

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Neuromarketing offers an alternative formula to study the TV audience that would lead to optimize the managerial actions of broadcasters and the return on investment for advertisers

Worldwide private channels have promoted neuroscience-based-research to optimizing TV shows and their promotional campaigns, advertising spaces and social TV and multi-screening viewing experience

The future implementation of neuromarketing in the private industry seems to be strongly dependent on its effectiveness to accomplish broadcasters' demands and to increase their business profits



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