

## **Special interest group proposal**

### **Psychophysiological measures: last developments in Marketing Research**

#### **PARTICIPANTS**

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#### **Abstract**

Last developments in the psychophysiological measures make it possible to observe new insights in marketing research. The first paper examines the contributions of psychophysiological measures, such as facial electromyography (EMG) and Electrodermal Reaction measurement (EDR) to predict advertising efficiency both in terms of Aad and recall. The second paper describe the use of analysis of electrodermal activity (EDR) to measure arousal at the point-of-sale and in advertising. The third paper illustrates some applications of electrical neuroimaging, using of electroencephalography (EEG) and intensive signal processing techniques, for the evaluation of marketing stimuli. Finally, the last paper is devoted to the managerial interests of these tools and stress some of the ethical and methodological recommendations for use in business.

#### **PAPERS:**

##### *Paper 1*

Title : Psychophysiological measures as a new method to measure advertising effectiveness

Authors: Olivier Droulers, Mathieu Lajante, Christian Derbaix, Ingrid Poncin and Bernard Rouillet

##### Abstract:

Emotions triggered by TV commercials has been considered as important since it has been found that they could predict advertising effectiveness. Indeed, many studies in consumer research have linked emotions and Attitude toward the ad (Aad) by means of self-report method. Hence, affective reactions might predict cognitive measures of advertising effectiveness such as ad and brand recall. However, self-report methods have obvious limitations such as the failure to report emotions because consumers are not aware of how they exactly feel, or they are not willing to report emotions because of social desirability problems. Simultaneously, more sophisticated psychophysiological methods have been developed to monitor and evaluate emotional reactions

induced by marketing stimuli, such as skin conductance responses (EDR) and facial electromyography (EMG). In this research, the complementary contributions of self-report measures and psychophysiological measures of emotional reactions to Aad and recall are examined. An experimental design was implemented in which participants watched different commercials (within subject design) while emotional reactions were assessed by facial EMG from the cheek and brow regions and by EDR. Emotional reactions were also recorded after each condition with iconic and verbal self-report scale. The results show the subjective relationship between self-report measurement of emotions and Aad in comparison with the objective relationship between psychophysiological measurement of emotion and Aad. Moreover, psychophysiological measure of emotion predicts advertising effectiveness in term of ad recall. Finally, some limits of the research are discussed. In conclusion, managerial implications and priorities for future research are outlined.

Key words: Aad, emotion, self-report method, psychophysiological method, TV commercial

## *Paper 2*

Title: Biometrics: The Use of EDR in Advertising and Point-of-Sale-Research

Author: Andrea Groppel-Klein

More and more researchers are becoming aware that the preferential use of verbal scales to measure psychophysiological responses (such as stimulation reactions) is problematic. The validity of verbal stimulation measurement can be questioned: on the one hand, traditional interviews are mostly carried out after a specific event (such as watching an advertising campaign or making a shopping trip) so that customers have to remember their perceived stimulation (arousal) and emotions. Thus, self-reporting methods only allow a time-lagged measurement. On the other hand, unconscious reactions cannot be measured and socially requested answering tendencies cannot be excluded. By contrast, electrodermal reaction (EDR) is considered to be a valid and also very sensitive indicator that responds clearly to the smallest variation in arousal. The analysis of electrodermal activity gives valuable insights into consumer behaviour. It shows cognitively unfiltered responses and also detects unconscious reactions. In contrast to brain scans (fmRI), large sample sizes not only in a lab but also at the point of sale are accomplishable (also because of the relatively small costs). The present paper delivers insights on arousal theory. The relevance of this topic will be illustrated by several empirical studies that have been conducted to investigate advertising effects and shopper behaviour. EDR is a suitable method to analyse “true” and also unconscious reactions to advertising. With EDR data and by comparing the results to explicit and implicit attitude measures, we can detect socially requested answering tendencies. We can also discover “halo effects”, indicating that under specific conditions, attitude towards the brand (especially when the brand strength is high) influences attitude towards the advert (not the other

way round). Such a halo effect deteriorates the control of advertising efficiency. In addition, by studying different “patterns” of EDR we can also find out whether commercials should evoke arousal at the beginning or at the end of an advertising campaign.

As reported in different empirical studies based on insights from theories of consumer decision making and on insights from environmental psychology, store atmosphere should also evoke phasic arousal reactions to attract consumers. EDR can be recorded at the POS simultaneously while shopping. The empirical findings establish a significant relationship between in-store stimuli and arousal and its relevance to buying behaviour. In addition, experiments reveal when products on promotion evoke (unconsciously) high stimulation and demand effects. A “mixed method” approach is also reported that combines EDR with observation data (via eye-tracking), sales data and verbally measured subjective experiences, giving detailed explanations for in-store-behaviour.

In summary, via biometric responses, researchers obtain valid, unbiased and cost-efficient information with regard to conscious and unconscious reactions to different marketing stimuli.

Key words: in-store stimuli, advertising, buying behaviour, arousal, electrodermal reactions

### *Paper 3*

Title: Time-varying cerebral and emotional indexes of the appreciation of commercials

Authors: Fabio Babiloni\*, Giovanni Vecchiato, Patrizia Cherubino and Arianna Trettel

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#### Abstract

Neuroimaging tools are a possible way to evaluate the efficacy of commercials. We illustrate some applications of electrical neuroimaging, a discipline that using electroencephalography (EEG) and intensive signal processing techniques, for the evaluation of marketing stimuli. We will show which kind of information is possible to gather with these methodologies while persons are watching marketing relevant stimuli. Such information will be related to the memorization and attention of such commercial advertisements. We noted that temporal and frequency patterns of EEG signals are able to provide possible descriptors conveying information about cognitive process in subjects observing commercial advertisements. Such information could be unobtainable through common tools used in standard marketing research. EEG methodologies could be then employed both to better design new products as well as to analyse the global impact on the consumers of video commercials already broadcasted.

Key words: Neuromarketing, Electroencephalography (EEG), design of new products

*Paper 4*

Title: Did Neuromarketing overclaimed its business power?

Author: Dr. Etienne Bressoud

Abstract:

Neuromarketing claims its ability to overcome declarative measures by using neurosciences tools. It made the buzz in the market research industry over last years. Then it led marketers to improve their knowledge on Neurosciences.

This presentation will discuss the tools that are used by market research agencies. It presents central and peripheral measures, pro and cons for business use. It also points out the learning of several years of practical use for business: insights as well as ethical concerns. Then, it presents recommendations of practitioners associations such as ESOMAR and Neuromarketing Science & Business Association (NMSBA).

Moreover, this presentation will expose how Neurosciences also inspire and validate other sciences, such as Behavioral Economics. A rising way of thinking that is becoming more and more popular among marketing practitioners, especially thanks to insightful learning on consumer decision process.

Key-words: Neuromarketing, Practice, Market Research Industry, Ethic, Behavioral Economics

## **AUTHOR PROFILES**

### **Fabio Babiloni**

Dr. Fabio Babiloni is currently Professor of Physiology at the Faculty of Medicine of the University of Rome “La Sapienza”, Rome, Italy. Professor Babiloni is author of 187 papers on bioengineering and neurophysiological topics on international peer-reviewed scientific journals, and more than 250 contributions to conferences and books chapters. He wrote 4 books on EEG signal processing. His total impact factor is 360 and his H-index is 40 (Google Scholar).

Prof. Babiloni is author of a book and a series of scientific papers published on peer-reviewed international journals related to the application of neurosciences to marketing messages. Professor Babiloni is currently grant reviewer for the National Science Foundation (NSF) USA, the European Union through the FP6 and FP7 research programs and different european agencies (France, Germany, Finland, Austria, Belgium, Spain, Cyprus). He is an Associate Editor of four scientific Journals, “IEEE Trans. On Neural System and Rehabilitation Engineering”, “IEEE Trans. On Biomedical Engineering”, “International Journal of Bioelectromagnetism” and “Computational Intelligence and Neuroscience”.

Prof. Babiloni was a former president (2007-2009) of the “International Society of Bioelectromagnetism” and (2009-2011) of the “International Society of Non Invasive Source Functional Localization”. Since 2007 is IEEE-EMBS Conference Editor and since 2011 is Chair of the IEEE Technical Committee of Biomedical Signal Processing

### **Etienne Bressoud**

After several years as an Associate Professor at Paris 8 University, Dr. Etienne Bressoud is now Innovation and Marketing Sciences Manager at BVA, a Market research company based in Paris, France. He is in charge of the R&D of the BVA Group, and works mainly on Neurosciences and Behavioral Economy. He is also Local Chair of the Neuromarketing Science & Business Association (NMSBA), member of board of the “Association Française du Marketing” and is co-animating a club on Neurosciences and Marketing in the French Marketing Practitioners Association, the Adetem. He published several researches on market research studies, persuasive communication and consumer behavior, in international scientific congress and reviews.

### **Christian Derbaix**

Dr. Christian Derbaix is Professor of Marketing at UCL-Mons (Louvain school of Management, Belgium). He received his PhD from the Catholic university of Louvain in 1978 and was ICM fellow. He was president of the Association Française du Marketing (AFM). He has published numerous scientific articles and books on consumer behavior. His research has appeared in journals including Journal of Marketing Research, International Journal of Research in Marketing, Journal of Advertising Research, Journal of Economic Psychology, Recherche et applications en Marketing... He is a member of different Editorial boards.

### **Olivier Droulers**

Dr. Olivier Droulers is currently Professor of Marketing at the School of Business Administration of the University of Rennes 1 (France). He received his M.D. from the faculty of medicine in Rennes in 1987 and his Ph.D. in Management from the faculty of Management in Rennes in 1996. His research activities fall within the general scope of Cognitive Science and he plead with others to the emergence of a "Consumer Neuroscience". He has published numerous scientific articles on neuromarketing (ACR, Journal of Neuroscience, Psychology, and Economics, Recherche et Applications en Marketing, Décisions Marketing...) and he is the coauthor of a recent book entitled "Neuromarketing, marketing revisited by consumer neuroscience" (2010).

### **Andrea Groppe-Klein**

Dr. Andrea Groppe-Klein is Chair of Marketing and Director of the Institute for Consumer & Behavioural Research at Saarland University since 2006. From 1996-2006, she was Chair of International Marketing, Consumer and Retailing Research at the European University Viadrina. She has published numerous scientific articles on consumer behaviour and on PoS-Behaviour. She organized the European ACR Conference 2001 in Berlin. From 1997 to 2010, she was Faculty Member of the EDEN Doctoral Seminar on Consumer Behaviour and was responsible for the topic "Affective Processes". She is editor of Marketing ZFP and JRM (the most important German Marketing journals) and member of different Editorial Boards of scientific European journals.

### **Mathieu Lajante**

Mathieu Lajante is currently Ph.D candidate in marketing at the School of Business Administration of the University of Rennes 1 (France). His thesis topic is related the study of emotion in consumer research by means of psychophysiological methods. He is also working on improving the signal processing and the quantization methods of SCRs and facial EMG activity. He has already presented papers in NeuroPsychoEconomics Conference and Advances in Consumer Research North America Conference, and has recently published a methodological paper in the Journal of Neuroscience, Psychology, and Economics. He is member of NeuroPsychoEconomics Association, Association for Consumer Research and French Association of Marketing.

### **Ingrid Poncin**

Dr. Ingrid Poncin, is professor of Marketing at LSM (Louvain School of Management) at University of Louvain (UCL). Dr. Ingrid Poncin is graduated as commercial engineer, qualified high school teacher and PhD from Catholic University of Mons (Louvain school of Management –Mons). She also holds Qualified researcher diploma – (Habilitation à diriger des recherches from Lille II University). Her expertise areas are in marketing research and consumer behavior. Her research is dedicated to the importance and measurement of affect in marketing and to consumer behavior in 3D commercial web site as well as in multichannel context. She published several

articles in peer reviewed journals in the last 5 years: Journal of Business Research, Journal of Advertising, Advances in Consumer Research, Recherche et Applications en Marketing, Management et Avenir, Journal of Retailing and Consumer Services.

### **Bernard Roulet**

Dr. Bernard Roulet has been working in automotive industry and consulting business as a marketing executive and a senior consultant, before joining the faculty in Paris. He defended a Ph.D. thesis addressing the effects of color on consumers' emotion and cognitions. He is now an associate Professor at the University of South Brittany (Vannes), after having spent four years at the Sorbonne in Paris. He is contributing to the development of consumer neuroscience, aiming at interpreting and explaining affective and cognitive processes in the consumers' minds, through the neuroscientific paradigm and frameworks. He published with O. Droulers in 2010 the first French handbook dealing with neuromarketing and consumer neuroscience: "*Neuromarketing, Le marketing revisité par les neurosciences du consommateur*"; Paris: Dunod Publishers; EAN13 9782100545643)