KNOWLEDGE AT HAND

Introduction to Neuroscience and Biometric Marketing Research Methods

August 2017

Neuroscience-based marketing research offers new tools for improving advertising creative and testing methods. After conducting two major research projects, the ARF has concluded that neurological and biometric marketing research methods have the potential to provide important new insights for the evaluation of commercials and other visual or print stimuli and that they can identify creative executions that sell more.

The strength of neuromarketing and biometric methods lies in their ability to uncover responses to advertising better than many other methods. Also, as they usually provide moment-by-moment data on changes in viewer reactions, they are well-suited to diagnose and improve marketing communication in a more detailed manner.

The ARF suggests that marketers explore neuroscience-based research methods and add them to their repertoire of methodologies. At the same time, as all methods have limitations and as there are a variety of biometric and neurological methods available, we recommend carefully studying the pros and cons of each of these methods and also suggest to evaluate the input from different research suppliers before using them for the first time.

Why neuro-based marketing research?

The application of neuroscience–based methods to marketing and advertising research has grown dramatically. These are the three main reasons:

- Nothing is more important for advertising effectiveness than good creative. If the ad does not sell, persuade, or build the brand, the best media plan won't succeed. Therefore, finding ways to increase the power of the marketing message is essential for increasing advertising effectiveness. –During the last five years, studies have shown that neuroscience-based marketing research can indeed help making advertising more effective (Venkatraman, Dimoka,

Pavlou, Khoi, Hampton, Bollinger, Hershfield, Ishihara, & Winer, 2015; Poltrack, Marci, & Wood, 2016; Bellman, Nenycz-Thiel, Kennedy, Larguinat, McColl, & Varan, 2017).

- The evidence has been mounting that consumers' emotions play a larger role in driving marketing decisions than widely assumed in the past. Neuroscience-based methods have the potential to assess those important drivers of advertising impact with more precision than most other methods.

- Adding neuroscience-based studies to the research process obviously adds cost, but much less so than five or even three years ago. In addition, considering the need to explore consumer experiences with mobile ads and other new forms of advertising, it clearly is a good investment.

Neuroscience-based methods: Overview

For more detail, please review literature recommendations (i.e., Stipp & Woodard, 2011; Cerf & Garcia-Garcia, 2017). This is important for these reasons:

- The various neuroscience-based measures differ greatly in how difficult they are to employ - which has a great impact on the cost of the research.

- It is important to understand exactly what a specific measure does. For example, most methods do not directly measure brain reactions, but are biometric measures from which brain activity is inferred. EEG and fMRI measure brain activity directly.

With that in mind, here is a summary of the important measures:

- Eye tracking: measures eye movement, eye fixations, pupil size. Measure of visual focus, attend and visual search with high temporal granularity.

- EKG (Electrocardiography) and Heart Rate (HR): measures electrical activity of the heart with external skin electrodes. Both assess arousal to stimuli.

- SCR (Skin Conductance Response): measures changes in electric conductivity of the skin induced by skin moisture. Used in connection with HR to assess arousal at a higher temporal resolution.

- Facial Coding: software measures subtle changes in facial expressions. Used to measure a range of emotions (such as happy or angry) and emotional valence.

- Implicit Association Measures (IAT): response latency measurement that estimates associations between two concepts (i.e., a brand and an attribute).

- EEG (Electroencephalography): Measures continuous, detailed, electrical brain activity on scalp. Used to assess attention, engagement, memory, and 'approach vs avoidance' behavior with high temporal precision.

- fMRI (Functional Magnetic Resonance Imaging): Measures brain activity by measuring changes in blood flow in the brain. Can pinpoint specific emotional and cognitive processes. High level of brain spatial specificity but low temporal granularity.

Best Practices

Given the complexity of these measures we recommend taking advantage of more comprehensive reviews such as Varan, Lang, Barwise, Weber, and Bellman (2015) and Cerf and Garcia-Garcia (2017). Here are some examples in brief:

- Be very clear about what needs to be measured and what your business objectives are before you decide which methods to use. Sometimes, eye tracking (one of the least expensive methods) may be sufficient. At other times, a much more complex study using several measures is essential to obtain the desired information.

- As said, it is essential to compare the various biometric and neuro methods: As with all methods, there are Pros and Cons, but there is more complexity here.

- Methods may be related, but they do measure different things (for example, different kinds of "attention"). We recommend asking vendors what exactly their methods can and cannot measure and to what extent emotions or other reactions are inferred, rather than actually measured.

- Use biometric and neuro-based methods early in the creative development process. Include creative agencies in the process.

- Data requires interpretation and should be reviewed alongside traditional testing data. Include the creative agency in the review of the data.

- Predictive power of the measures and the conclusions improves when several neurological and traditional measures are combined.

- Note that business applications of biometric and neuro testing techniques can deliver improvement on a wide variety needs:
  - Advertising creative: traditional, digital and mobile
  - Brand logos, package design and color schemes
  - Website design
  - In-store placement of products, consumer experience in store and shopping behavior
  - Product design
  - Brand tracking

- o Promotional campaign
- o User Experience Design (UXD)

SOURCES

*Bellman, S., Nenycz-Thiel, M., Kennedy, R., Larguinat, L., McColl, B., & Varan, D. (2017). "What makes a television commercial sell? Using biometrics to identify successful ads: Demonstrating neuromeasures' potential on 100 Mars brand ads with single-source data." *Journal of Advertising Research, 57*(1), 53-66. Retrieved from
http://www.journalofadvertisingresearch.com/content/57/1/53

Cerf, M., & Garcia-Garcia, M. (2017). *Consumer neuroscience*. Cambridge: MIT Press.
https://mitpress.mit.edu/books/consumer-neuroscience

*Poltrack, D., Marci, C., & Wood, L. (2016). The neuroscience behind creating better creative. *Presented at the ARF Audience Measurement conference.* Retrieved from Powersearch
https://cdn.thearf.org/ARF_Knowledgebase/ARF Audience Measurement/AM_2016/The-Neuroscience-Behind-Creating-public.pdf

Stipp, H., & Woodard, R. (2011). *Uncovering emotion, using neuromarketing to increase ad effectiveness.* ARF Whitepaper.

*Varan, D., Lang, A., Barwise, P., Weber, R., & Bellman, S. (2015). How reliable are neuromarketers' measures of advertising effectiveness? Data from ongoing research holds no common truth among vendors. *Journal of Advertising Research, 55*(2), 176-191. Retrieved from
http://www.journalofadvertisingresearch.com/content/55/2/176

Venkatraman, V., Dimoka, A., Pavlou, P. A., Khoi, V., Hampton, W., Bollinger, B., Hershfield, H. E., Ishihara, M., & Winer, R. S. (2015). Predicting advertising success beyond traditional measures: New insights from neurophysiological methods and market response modeling. *Journal of Marketing Research*, *52*(4), 436-452.

RECOMMENDED LITERATURE

*Bordes, N., & Varan, D. (2016) *Seeking the moment of ad impact.* Presented at the ARF Re!Think Conference. Retrieved from PowerSearch https://cdn.thearf.org/ARF_Knowledgebase/ARF Rethink/ReThink 2016/Seeking-The-Moment.pdf

*Grayman, T., & Yadav. P. (2016). *Rebirth of a king: The premiere of Spike TV's Tut.* Presented at the ARF Audience Measurement Conference. Retrieved from PowerSearch
https://cdn.thearf.org/ARF_Knowledgebase/ARF Audience Measurement/AM_2016/Memory-vs-Engagement.pdf

*Kalsi, M., & Yadav, P. (2016). *Beneath the radar: Reaching entrenched consumers with subtle nranding.* Presented at the ARF Re!Think Conference. Retrieved from PowerSearch https://cdn.thearf.org/ARF_Knowledgebase/ARF Rethink/ReThink 2016/Reach-Entrenched-Consumers.pdf

*Marci, C. (2016). *The right ad at the right time = Cross-platform success.* Presented at the ARF Audience Measurement Conference. Retrieved from PowerSearch https://cdn.thearf.org/ARF_Knowledgebase/ARF Audience Measurement/AM_2016/The-Right-Ad-at-the-Right-Time.pdf

*Moses, E. (2015). *Sound or sight? Wearable biometrics & facial coding solve engagement*. Presented at the ARF Re!Think conference. Retrieved from PowerSearch https://cdn.thearf.org/ARF_Knowledgebase/ARF Rethink/2015 ReThink/Presentations/2015 ReThink - Sound or Sight.pdf

Stipp, H. (2014, Sept.). Applied neuroscience: From novelty to must-use. *Admap.* Retrieved from WARC https://www.warc.com/SubscriberContent/Article/A102727_Applied_neuroscience_From_novelty_to_mustuse/102727 [Access for WARC subscribers only]

*Stipp, H., & Garcia-Garcia, M. (2016). *How advertising works deep dive session: Neural pathways to great creative.* Presented at the ARF Re!Think Conference. Retrieved from PowerSearch https://cdn.thearf.org/ARF_Knowledgebase/ARF Member Only Events/2016.9.22 Deep Dive Session - Maximizing Mobile Creative/Neural-Pathways-to-Great-Creative_Stipp_Garcia-Garcia (1).pdf

*To access Journal of Advertising Research articles and ARF conference presentations
ARF members can log in with their ARF credentials at https://thearf.org/