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Demystifying neuromarketing

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ABSTRACT

This article adopts an integrated knowledge inquiry approach and systematically reviews (through content analysis) and draws themes (through thematic analysis) to explain the concept of, methods for, ethical issues related to, and contributions from neuromarketing and to discuss the future role of neuromarketing as a provider of new impetuses for advancing marketing science. In doing so, this article clarifies the key questions about neuromarketing and identifies multiple avenues to meaningfully extend existing lines of inquiry on neuromarketing. Thus, this article should assist neuromarketers in unlocking the potential of neuromarketing to contribute to marketing theory and practice.

1. Introduction

Neuromarketing is a popular topic and area of research in marketing science. In essence, the goal of neuromarketing is to adapt theories and methods from neuroscience and combine them with theories and methods from marketing and related disciplines, such as economics and psychology, to develop neuroscientifically sound explanations of the impact of marketing on target customer behavior. Indeed, neuromarketing, as a method of investigation, is important because it uses neuroscientific theories and methods to gain access to otherwise hidden information. Such information materializes through the observation of neural processes without asking people directly for their thoughts, feelings, memories, evaluations, or decision-making strategies. The outcome of neuromarketing, as a field of research, is promising as its findings can secure new ground for generating new marketing theories or supplementing existing theories in marketing and related disciplines.

Many neuromarketing scholars have published conceptual (e.g., Butler, 2008; Garcia & Saad, 2008; Lee, Broderick, & Chamberlain, 2007) and review (e.g., Cruz, Medeiros, Hermes, Marcon, & Marcon, 2016; Fortunato, Giraldi, & de Oliveira, 2014; Plassmann, Ramsøy, & Milosavljevic, 2012; Schneider & Woolgar, 2012) articles in the area. However, few studies have rigorously produced empirical findings on the topic (e.g., Costa, de Freitas, & Paiva, 2015; Jai, O'Boyle, & Fang, 2014; Stoll, Baecke, & Kenning, 2008; Vance & Virtue, 2011), and even fewer have appeared in the main academic outlets for marketing science (e.g., *Journal of Marketing*, *Journal of Marketing Research*, *Marketing Science*). This situation may be due to uncertainties associated with neuromarketing, such as the academic efficacy of neuroscience measurement techniques in advancing marketing theory, the ethical concerns with using such techniques, and the practical utility of such techniques as effective tools for marketing practice (Ariely & Berns, 2010; Arussy, 2009; Murphy, Illes, & Reiner, 2008).

In addition, neuroscience, in general, can be intimidating to both established and new marketing researchers, who may develop a piecemeal understanding of neuroscientific methods by associating neuroscience with brain imaging only (Lee et al., 2007); however, this does not need to be the case, as this article aims to show. More important, many scholars have called for greater programmatic and integrative research in neuromarketing for its study to emerge as a full-fledged area of marketing science, especially in mainstream marketing journals (e.g., Breiter et al., 2015; Lee, Chamberlain, & Brandes, 2018; Smidts et al., 2014). This is especially important given the powerful role of neuromarketing literature in educating marketing researchers, who may lack training opportunities of the type typically provided in undergraduate and postgraduate neuroscience degrees, and in driving future research in the field beyond the circle of experienced marketing scholars.[1] Thus, there is a need to demystify neuromarketing and to stimulate greater interest in actionable neuromarketing research, especially in academic outlets dedicated to the advancement of marketing science (Daugherty, Hoffman, & Kennedy, 2016; Daugherty & Thomas, 2016; Lee et al., 2018).

Given the identified gaps, this article aims to (1) demystify neuromarketing by explaining the concept of, methods for, ethical issues related to, and contributions from neuromarketing and (2) stimulate greater interest and research in the area by discussing the future role of neuromarketing and the new impetuses that it can offer for marketing

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[1] For example, Ale Smidts, Carl Marci, Carl Senior, Carolyn Yoon, Douglas Fugate, Hilke Plassmann, Martin Reimann, Nick Lee, Laura Chamberlain, Leif Brandes, Peter Kenning, Richard Silberstein, Rumen Pozharliev, Selena Nemorin, Terry Daugherty, Thomas Zoëga Ramsøy, and Vinod Venkatraman, to name a few.

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theory and practice. In particular, this article adopts an integrated knowledge inquiry approach—that is, creation of essential questions about a topic and exploration of their solutions (Lim, 2016)—as a new mode of thinking to solve the uncertainties associated with neuromarketing. Moreover, this article aims to answer the call of Lee et al. (2018) and Levallois, Clithero, Wouters, Smidts, and Huettel (2012) for research to help clarify the concept of, methods for, and ethical issues related to neuromarketing, so as to substantially increase the potential for growth in neuromarketing research and facilitate greater acceptance and visibility of the field. Finally, this article also extends Lee et al.'s (2018) quantitative work in providing an agenda for future neuromarketing research, specifically by mapping the current state of and contributions from extant neuromarketing literature, with a specific focus on mainstream marketing journals, and by identifying potentially fruitful directions for further neuromarketing research from a mixed methods approach in the form of quantitative content and qualitative thematic analyses.

2. What is neuromarketing?

Neuromarketing is an interdisciplinary product of neuroscience and marketing. The concept was first coined and referred to by Ale Smidts in 2002 as "the study of the cerebral mechanism to understand consumer behavior in order to improve marketing strategies" (Boricean, 2009, p. 119).

However, in the ensuing decade, multiple definitions of neuromarketing developed. More specifically, some scholars viewed neuromarketing as "the application of neuroscientific methods to analyze and understand human behavior in relation to markets and marketing exchanges" (Lee et al., 2007, p. 200), while others characterized it as "a field that focuses on the marketing implications from understanding the interaction of cognitions and emotions in human behavior based on neuroscientific methods" (Javor, Koller, Lee, Chamberlain, & Ransmayr, 2013, p. 3), "an extension of traditional marketing methods that seeks a deeper level of manipulation based on instinctive responses" (Nemorin, 2017), "the intersection of consumer behavior and cognitive neuroscience" (Garcia & Saad, 2008, p. 398), "the application of findings from consumer neuroscience within the scope of managerial practice" (Hubert & Kenning, 2008, p. 274), and "the study of the cortical substrates of social influence in an applied setting" (Senior & Lee, 2008, p. 264).

In addition, neuromarketing, which encapsulates the commercial (e.g., retail marketing) and non-commercial (e.g., social marketing) use of neuroscientific theories and methods to gain consumer insights and marketing effects (Ramsøy, 2015), should be distinguished from closely related concepts, such as consumer neuroscience, which pertains to the academic exercise of using neuroscientific theories and methods to enrich understanding of consumer psychology and behavior (Plassmann, Venkatraman, Huettel, & Yoon, 2015), and neuroeconomics, which refers to the sensemaking of economic problems through the analysis of neural correlates of decision making of the type studied in behavioral economics (Nemorin & Gandy, 2017). Nonetheless, neuromarketing is similar to consumer neuroscience and neuroeconomics in that it is a form of non-clinical research that studies subjects in healthy populations, as opposed to neurology, which is a form of clinical research that studies subjects in populations with nervous system disorders (e.g., injuries, traumas, tumors), and neuroscience, which studies myriad species ranging from the primitive (e.g., leeches, jellyfish) to the complex (e.g., mammals, primates) (Plassmann et al., 2012).

More important, concepts (e.g., consciousness, memory, long-term potentiation) and theories (e.g., Bayesian free energy principle, Hebbian theory, Schultz theory, theory of spatial memory) from neuroscience can be supplemented with marketing theories to support and enrich neuromarketing interpretations (see Craver, 2002; Friston, 2009; Hebb, 1949; Knill & Pouget, 2004; Schultz, Tremblay, & Hollerman, 2000). These concepts and theories can also be tested using traditional, non-neuroscientific methods often employed in marketing to gain insights into how marketing can help explain unknown states of the world causing sensory movements and reactions in the brain; it should be noted, however, that the contributions from such investigations may only be novel for neuroscience rather than for marketing (or neuromarketing) (see Arbib, 2003). Following these leads, neuromarketing can be defined more comprehensively as follows:

> Neuromarketing is an interdisciplinary branch of knowledge that is predicated on the use of neuroscientific concepts, theories, and methods (or tools and techniques to record brain and neural activity during behavior) to study the brain and nervous system in the pursuit of understanding instinctive (or natural) human behavior, in terms of cognitions and emotions, conscious and unconscious, in response to a marketing stimulus (e.g., markets, marketing exchanges), whereby the knowledge resulting from a neuromarketing investigation contributes to the development and advancement of marketing theory and the planning and implementation of marketing strategies, with (e.g., to make a sale) and without (e.g., to influence behavior for a social good) commercial marketing goals.

Such a definition has five main upshots. First, it clarifies the nature of knowledge relied on and developed in neuromarketing—i.e., interdisciplinary. Second, it explains the type of methods used in neuromarketing—i.e., neuroscientific methods. Third, it elucidates the outputs of using those methods—i.e., studies on the brain and nervous system. Fourth, it makes clear the outcomes of those outputs—i.e., understanding of instinctive human behavior in applied marketing settings. Fifth, it delineates the impacts of those outcomes—i.e., conceptual and managerial implications for marketing theory and for planning and implementation of marketing strategies.

3. What neuroscientific methods exist for neuromarketing?

Neuroscientific methods encapsulate the use of tools and techniques to measure, map, and record brain and neural activity during behavior and, in doing so, generate neurological representations of that activity for understanding specific responses in the brain and nervous system as a result of exposure to a stimulus. These methods, which allow neuroscientists to observe in real time the neural processes that occur during behavior, can be classified into three broad categories: neuroscientific tools and techniques that record neural activity inside (electromagnetic and metabolic) and outside the brain, and neuroscientific methods to manipulate neural activity (see Fig. 1). What follows in the next sections are brief summaries of the most pertinent neuroscientific methods recommended for neuromarketing. For additional readings on these methods, see Bercea (2012), Kable (2011), Morin (2011), Plassmann, Ambler, Braeutigam, and Kenning (2007), Ramsøy (2015), and Zurawicki (2010).

3.1. Neuroscientific methods that record neural activity inside the brain

3.1.1. Electromagnetic: electroencephalography

Electroencephalography (EEG) tests and records electrical activity in the brain using a band or helmet with small, electrodes placed onto the scalp of the test subject (Kable, 2011; Reimann, Schilke, Weber, Neuhaus, & Zaichkowsky, 2011; Solnais, Andreu-Perez, Sanchez-Fernandez, & Andreu-Abela, 2013). It is a non-invasive method that detects the changes in electric currents in the form of brainwaves, which are produced and recorded when test subjects are exposed to a marketing stimulus (Morin, 2011; Plassmann et al., 2007). More important, EEG offers neuroscientists in marketing the benefit of high temporal resolution for the detection of brief changes in brain activity at relatively low costs and thus helps them assess the value of a marketing stimulus (Morin, 2011). In addition, the design of EEG is portable, and thus it can be employed in real-life marketing environments (Bercea, 2012). However, the spatial resolution produced by EEG is

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