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Exploring Neuromarketing and Its Reliance on Remote Sensing: Social and Ethical Concerns

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This article evaluates the consequences of neuromarketers' reliance on direct and indirect forms of remote sensing. These remote sensing strategies, tactics, and resources include various sophisticated techniques for evaluating neuronal and behavioral responses to commercial messages with the aid of functional magnetic resonance imaging (fMRI) technology. The information generated with the aid of fMRI, in combination with inferences drawn from the massive data analyses enabled by machine learning techniques, is expected to contribute to the power and influence of market-oriented segmentation and targeting. After characterizing the current state of and future trends in applied neuromarketing research, we discuss how reliance on descriptive, predictive, and prescriptive communications strategies enabled by remote sensing will affect the life chances and well-being of segments of the global population. We conclude with a discussion of the moral and ethical implications of these developments, primarily in the context of public policy deliberations related to privacy and surveillance that we associate with remote sensing.

Keywords: *neuromarketing, remote sensing, ethics, privacy and surveillance, discrimination, inferential statistics, technology assessment*

The potential for neuroscience to reveal the workings of the human brain has burgeoned as an area of interest for diverse audiences in the decades since the emergence of an interdisciplinary approach to the study of the brain and its functions. Of particular significance has been the development of insights into how the brain both changes and can be shaped as a function of experience (Ansari, 2012; Lenroot &

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[1] We would like to express our appreciation of the considerable efforts made by our reviewers to improve this article by their pointed questions, helpful suggestions, and generous supply of detailed and hyperlinked references to articles that greatly enhanced our understanding of many of the technical issues related to neuroscience and its applications in the field of marketing.

Giedd, 2006). Consequently, we observe increasing agreement that neuroscientific discoveries are key to the management of human activities, including psychiatric illnesses, economic behaviors, social experiences, spirituality, and ethics (Abi-Rached & Rose, 2010).

Although concerns have been expressed about what Tallis (2011) has termed "neuromania"—the view that the complexity of human consciousness can be reduced to neural activity—neuroscience research methods are nevertheless being applied to an array of new fields, such as neuroaesthetics, neurotheology, neurolaw, neuroeconomics, and neuroeducation, to name a few. Not surprisingly, these new knowledges have made their way into the commercial sector—specifically in the field of neuromarketing, where companies offer assessments and predictions about consumer behavior based on images of the brain's reactions to stimuli (Ariely & Berns, 2010). These reports are used to develop advertising strategies that are designed to influence consumers' responses to messages regarding the attributes of products and services in the marketplace.

Based on its utilization of insights derived from neuroscience, the scope of neuromarketing's impact within society is potentially enormous. Farah's (2012) review of the ethical, legal, and societal impacts of neuroscience begins with a rather expansive claim that any "behavior that depends upon being able to understand, assess, predict, control, or improve human behavior is, in principle, a potential application area for neuroscience" (p. 573). Although scholars such as Eser, Isin, and Tolon (2011) do not see anything inherently problematic about using scientific technology and neurocognitive models to advance commercial interests, they do suggest that the application of imaging technologies to probe the machinations of the human brain, "especially beyond what one might divulge in traditional behavioural testing" (p. 860), raises ethical concerns. Murphy, Illes, and Reiner (2008, p. 298) highlight similar ethical considerations regarding (1) the protection of various parties who may be harmed or exploited through the process of neuromarketing and (2) the protection of consumer autonomy if applications of brain imaging technology are developed to the point that they can enable what is effectively the manipulation of consumers from afar. Stanton, Sinnott-Armstrong, and Huettel (2016), on the other hand, acknowledge that potentially serious ethical issues may emerge from neuromarketing research practices which are largely proprietary and opaque. However, they also conclude that most of the commonly expressed ethical concerns, especially those related to consumer autonomy and privacy, are not meaningful issues because of the current levels of capability on display in current implementations, and they are not expected to be improved substantially in the near future.

This article focuses on some of the more troubling questions that arise when we consider what is being learned about the general population, as well as about particular segments of that population, from intensive studies of relatively small convenience samples (Falk, Berkman, & Lieberman, 2012; Falk, Cascio, & Coronel, 2015) in combination with the predictive models of consumer behavior derived from what has commonly been referred to as "big data analysis" (Barocas & Nissenbaum, 2014; Dwork & Mulligan, 2013; Yeung, 2017).

We explore the essence of these concerns through a critical examination of applied neuroscience by marketers through what we see as a metaphoric extension of the meaning of the term *remote sensing* beyond that traditionally associated with the images and maps derived from data gathered by earth-

orbiting satellites (Longley, Barnsley, & Donnay, 2001/2005). For our purposes, the meaning of remote sensing will be extended to include various devices, strategies, and techniques that enable the identification, evaluation, and production of influence over a whole host of targets of interest based on meaningful measures of remoteness or distance (Gandy, 2012).

This article evaluates the social consequences that flow from the reliance of neuromarketers on direct and indirect forms of remote sensing. We call particular attention to a number of troublesome outcomes that are likely to result from the industry's increasing use of enhanced forms of visualization and analysis of neuronal activation enabled by functional magnetic resonance imaging (fMRI). After characterizing the current state of neuromarketing research, noting the kinds of instrumental and theoretical challenges that currently limit the nature of the applications of scientific insights in the marketing realm, we turn our attention to the ways in which greater reliance on neuroimaging and other remotely acquired information about consumers will affect the life chances and well-being of segments of the global population, many of which are already burdened by economic, social, and political discrimination (Grier & Kumanyika, 2010).

Our concerns about remote sensing as a means of gaining knowledge, or strategic intelligence about individuals and the groups to which they have been assigned by algorithmic assessments, are closely linked to concerns raised by privacy and surveillance scholars about the threats to autonomy and self-determination (Zarsky, 2003, pp. 35–44) associated with the segmentation of populations and the targeting of manipulative communications (Barocas & Selbst, 2016; Calo, 2014, pp. 1031–1034).

What Is Neuromarketing?

In the 1950s, Vance Packard (1957) observed how advertising agencies had begun to use the research of cognitive psychology and behavioral science to probe the consumer mind for information that would inform the design of effective subliminal advertising campaigns. The aim was to convince groups of people to perform simple actions such as buying a product. Of necessity, advertising had to be "convincing with limited arguments and few words" (Ellul, 1964, p. 364). Here, the primary purpose of advertising was the creation of a particular way of life. It was not as important to persuade the individual through rational means; rather, the aim was to implant in the individual a certain way of thinking about life, appealing to desires over reason (Girard, 1976).

Over the years, consumer market research has continued to build on these methods and now incorporates the diagnostic techniques of neuroscience to give rise to neuromarketing, a contemporary form of market research that uses brain and other bioimaging technologies to track how consumers respond to advertising stimuli. Marketers use these data as aids to understanding the nuances within messages that distinguish between those that are more or less effective in mobilizing a desired response.

Although the terms *neuromarketing* and *consumer neuroscience* have been used interchangeably in the literature, consumer neuroscience tends to refer to academic research that combines neuroscience, psychology, and biology to explain contextually situated human behavior such as consumption (Plassmann, Venkatraman, Huettel, & Yoon, 2015; Stanton et al., 2016). Neuromarketing tends to refer to

practitioner interest in neurophysiological tools that are used when conducting commercial market research (Javor, Koller, Lee, Chamberlain, & Ransmayr, 2013). Whereas neuromarketing is primarily focused on the effort to mobilize consumer demand for the goods and services provided by clients, cognitive neuroscientists, in partnership with social marketing researchers, often seek to reduce harmful consumption practices, such as smoking, while increasing participation in beneficial activities, such as exercise (Farah, 2014).

Neuromarketing has also been categorized as a subarea of neuroeconomics (Camerer, Loewenstein, & Prelec, 2005; Kenning & Plassmann, 2005), in which "the application of neuroscientific methods to analyze and understand human behaviour in relation to markets and marketing exchanges" (Lee, Broderick, & Chamberlain, 2007, p. 200) is increasing. Neuroeconomics aims to make sense of economic problems through the analysis of the neural correlates of decision making (Hubert & Kenning, 2008), focusing on variables commonly studied in behavioral economics, such as risk (Kahneman & Tversky, 1979), self-control (Hare, Camerer, & Rangel, 2009), and reward magnitude (Smith & Walker, 1993).

For this article, we use the term *neuromarketing* to refer to a commercialized market research method for studying brain activity that combines the methodologies of neuroscience and behavioral psychology to generate greater understanding about how consumers respond to products, brands, and advertising stimuli. These insights are then used to inform the development of advertising strategies that are designed primarily to "nudge" particular demographic groups or population segments to take consumptive action.

While neuromarketing builds on traditional forms of market research comprising both physiological measurement and communicative interactions, its technological resources have been expanded to incorporate advanced neuroimaging techniques to measure, collect, and interpret consumer responses to stimuli, which some neuromarketers think are more accurate and reliable predictors of behavior than self-report (Fortunato, Giraldi, & Oliveira, 2014; Venkatraman et al., 2015). This is thought to be especially important with regard to preferences about which consumers or citizens are often reluctant or unwilling to reveal to others (Jost, 2017).

The two most common brain imaging techniques involve functional magnetic resonance imaging, which determines neurological activity based on changes in blood flow to certain areas of the brain, and electroencephalography, which uses electrodes applied to the scalp to measure changes in the electrical field in the brain (Ariely & Berns, 2010). The information obtained from what some have referred to as "neural focus groups" (Falk et al., 2012) is not only used to calibrate advertising stimuli according to bio- and neurological responses but is also generalized for a range of data profiling activities, such as identification, classification, and representation of consumers in the form of automated data profiles. Schneider and Woolgar (2012) offer a helpful summary of the practical application of neuroanalytical techniques:

> Brain imaging is used to assess which areas of the brain are active in relation to specific tasks undertaken by the subject, and what is the extent of this activity. This is done, for

> example, in relation to the visual perception of the colour or shapes of products, or the effect on the brain of certain smells and odours. In the case of fMRI, the extent of brain activity is inferred from changes in the amount of blood flow in specific areas of the brain. Although the original measurement information is numerical, not visual, the protocol for presenting this information typically represents this information through the use of various colours. It is this which enables the subsequent locution, in a telling use of metaphor that the brain "lights up" in response to certain forms of stimulation. (pp. 172–173)

Noninvasive imaging tools used for measuring consumer responses to stimuli also include a range of biometric indicators traditionally used in studies of consumer psychology (Andrejevic, 2012). Biometrics are said to have become popular resources for marketers because they are believed to provide insight into unconscious mental processes (Venkatraman et al., 2015, p. 5). Nielsen (2016) uses both brain imaging and biometric tools to measure real-time brain and other physiological responses. As its website states, Nielsen aims to "capture a more comprehensive view of the non-conscious aspects of consumer decision-making with the most complete set of neuroscience tools at a global scale" (para. 1). Other proponents such as Lindstrom (2010), Fugate (2008), and Zaltman and Zaltman (2008) claim that when researchers use brain imaging tools, they are able to map neural functions connected to vision as well as individuals' cognitive and affective responses to advertisements.

However, Wilson, Gaines, and Hill (2008) emphasize that conclusions drawn from the correlations between brain functions and blood flow, for example, should be approached with caution. These kinds of interpretations require drawing connections between cognitive or affective responses to neural activity and then characterizing the meaning of the neural activity that occurs in particular regions of interest within the brain. Although neuroscience has certainly made advancements in connecting neural activity to blood response, "much remains to be learned about the relationship between a task-related thought or emotion and neuronal activity" (Wilson et al., 2008, p. 394). Indeed, the nature of this challenge is so substantial that critical observers have likened understanding the complexity of the neural systems in the brain to understanding the operation of a microprocessor and have suggested that current investigative strategies in neuroscience would not be up to the task (Jonas & Kording, 2017).

Assessments of the accuracy, reliability, and predictive utility of these measures when applied to the requirements of marketers are more difficult to produce. This is due in part to neuromarketers' reluctance to reveal the nature of their particular strategies and techniques to their competitors. Despite calls for neuromarketing companies to adopt policies of data and protocol transparency (Stanton et al., 2016), rigorous evaluative assessments of particular neuromarketing experiments and campaigns are rarely published in scholarly marketing journals. However, an early assessment of a number of these studies claimed "that at least some aspects of advertisement perception, brand memory and economically relevant choice behaviour are amenable to neuroscientific investigation" (Plassmann, Ambler, Braeutigam, & Kenning, 2007, p. 165). They continued to suggest, however, that "the current research is a patchwork of largely unrelated studies addressing a wide range of potentially relevant issues. It appears that, to date, no direct 'recipes' can be derived from this new research" (p. 166).

Somewhat later, a series of studies, referred to as “Neuro 1” and “Neuro 2,” were organized by the Advertising Research Foundation to help commercial buyers of neuromarketing services evaluate and compare the quality of the guidance being offered by different vendors (Varan, Lang, Barwise, Weber, & Bellman, 2015). These studies revealed considerable disagreements among vendors about what their methods predicted about how individual advertisements performed, and they use different terms to identify what was actually being measured. This led the evaluators to suggest that “the study does demonstrate that these measures do not reflect a common truth” (p. 187), which would make it difficult for purchasers of these services to understand what precisely they were buying in this emerging commercial service market.

Despite these criticisms, neuromarketers continue to construct models and characterizations of consumers derived from their interpretations of experimental data. These data inform the creation of consumer profiles that are used to categorize individuals and groups as particular “brain types.” This knowledge is then used by marketers to segment consumers into groups in terms of their expected response to particular commercial messages. Schneider and Woolgar (2012) explain that such uses of brain imaging and other measures of physiological responses

> reveal and enact a particular version of the consumer that depends on an achieved contrast between what appears to be the case—consumers’ accounts of why they prefer certain products over others—and what can be shown to be the case as a result of the application of the technology—the hidden or concealed truth. (p. 171)

These “new and improved” impressions of consumers’ worlds are disclosed to neuromarketers’ clients as insights into the theoretically constructed and empirically validated models of their targets. Such representations of the consumer hinge on the assumption that consumers are (a) entities who do not know themselves very well and (b) marketing targets that can be triggered into buying responses through exposure to advertising stimuli calibrated to activate specific internal drives.

Remote Sensing

Because of the reliance of neuroimaging on technological resources to gather data about the status and changes taking place in different areas of a person’s brain, and because the transformation of that data into visual representations involves the use of various statistical methods to produce accurate, reliable, and conceptually valid approximations of a complex process, we refer to neuroimaging as a form of remote sensing (Arnason, 2010, p. 190).

Of course, this quality of remoteness is not limited to that which is implied by the use of visual images meant to reflect changes in the blood-oxygen-level-dependent signals being detected in different regions of interest within a research subject’s brain. It is more critically associated with the remoteness of this proxy measure from the great variety of cognitive and affective responses it is actually meant to represent (Farah, 2014, pp. S19–S21; Poldrack & Yarkoni, 2016).

A still further sense of remoteness is associated with attempts to relate the responses observed in research subjects in the laboratory to those of other individuals who might be exposed to the same (or similar) stimuli in their homes or in their neighborhood markets. It is this particular relationship—the one in which cognitive and affective responses of research subjects to features of a commercial message are used to predict a behavioral response, such as the purchase of a particular brand of chocolate by members of the general public (Kühn, Strelow, & Gallinat, 2016)—that we identify as the most remote—and the most concerning.

The term *remote sensing* is generally applied to the use of a range of technologies to gather information at some distance in time or space from the object, entity, behavior, or phenomenon of interest (Lillesand, Keifer, & Chipman, 2015). The use of these technologies is widespread and growing despite the fact that distance, however conceived, usually represents a threat to the accuracy, precision, and reliability of the information that would have been gathered if a more direct, or less remote, method of observation or measurement were available at a reasonable cost (Farah, 2012; Mingers, 2006; Pickles, 1995). Researchers interested in capturing and representing spatiotemporal relations between individuals have suggested that remote sensing and social sensing are analogues or complements that differ in terms of their emphasis on the socioeconomic characteristics of data subjects (Liu et al., 2015). However, because social sensing, as proposed as a conceptually distinct analytical focus, relies primarily on data from identifiable individuals, it loses the critical dimension of remoteness that we associate with the experimental research and inferential classifications used by neuromarketers.

The most traditional use of the term *remote sensing* refers to the great physical distance from which earth-orbiting or geostationary satellites capture information and facilitate the production of images that inform us about the past, present, and future status of the people, places, and things being sensed from afar.

As is common with most uses of remote sensing technology, there is a need for the identification of proxy measures that can stand in for or represent the actual subject of interest (Liu, et al., 2015; Longley et al., 2001/2005). The variety and extent of information about geographic areas represented in colorful maps reflect the use of statistical techniques that provide measures of closeness or similarity that describe relationships not fully captured by notions of physical distance (Pickles, 1995). Correlation-based assessments of the relationships between variables, or measures of theoretical constructs, are especially useful as indicators of the similarity or difference between theoretically defined objects of interest. Multidimensional techniques such as factor and cluster analysis and multidimensional scaling are often used to identify different types of people on various levels. The fact that it is up to the analyst to determine how many factors, clusters, or dimensions will be defined by which sets of measures and criteria of importance underscores the diversity of ways in which an indicator of distance, or similarity, can become a standard for neuromarketers' strategic decision making (Cappella, 2017, pp. 8–9; Mingers, 2006).

Much of the widespread public interest in applications of neuroscientific methods is understandably associated with the colorful maps of activated regions of brains that have been scanned. The attractiveness and power of these images is sustained in part because the general public is unaware of the quite substantial technical and statistical preprocessing of data that enables the publication of

"images that actually look like brains" (Woolrich, Beckmann, Nichols, & Smith, 2016, p. 184). There are ongoing debates about the extent of the accuracy, precision, and reliability associated with different representations of the status of the proxies being used as a basis for drawing inferences about a subject's response to various stimuli in a range of contextual situations (Cascio, Scholz, & Falk, 2015; Falk et al., 2015; Farah, 2014). These debates tend to focus on the appropriateness of the statistical tools being used to support or evaluate the claims being made by scientists or practitioners.

Statistical Inference and Samples

Unlike traditional uses of statistics in support of the description and representation of objects and entities and the relationships between them, we primarily seek to call attention to the remoteness associated with the use of statistics in support of inferential assessments of people, places, and things that have not actually been sensed or measured directly.

For example, much social and behavioral science research, as well as much marketing research, seek to expand our understanding of the nature of human beings in general. In cases of applied research, such as that concerned with public health, experiments designed to provide information about health-related problems are performed with animal models or proxies because of ethical or legal barriers to human experimentation. This kind of remote sensing depends to a great extent on the ability of researchers to demonstrate that there are enough similarities between these models or proxies and the humans who are the real targets of interest.

A somewhat different set of considerations arises when assessments, plans, and policies are made that are likely to affect people, but not necessarily those who have given their informed consent to serve as participants in experiments, surveys, or other data-generating activities. Whether they are paid or are serving as volunteers, these research subjects who stand in for the rest of us are generally given the sense that they are making a contribution to the well-being of the population at large, or some special segment that they are believed to represent. Indeed, in the case of university or government-funded research projects, researchers are usually expected to identify the nature of the trade-offs between the risks these subjects face and the benefits to be realized by society. Unfortunately, these human subjects guidelines generally do not constrain the kinds of experiments and studies carried out by commercial firms engaged in marketing research (Murphy et al., 2008).

Most of these examples of remote sensing in the social and behavioral sciences and applied communication research involve the use of inferential statistics, a well-established set of principles and practices that supports the expression of claims about a population made on the basis of observations derived from a representative sample (National Research Council, 2013, pp. 123–131). The assumptions about the representativeness of the samples are traditionally based on the randomness with which the samples have been drawn from target populations. Unfortunately, many factors—including those that systematically exclude some members of a population from being included in the sample (imprisonment, homelessness, illiteracy, etc.) and failures to recruit and retain minority research subjects (George, Duran, & Norris, 2014)—contribute to many samples being far from representative (Heinrich, Heine, & Norenzayan, 2010).

It is generally agreed that many of the insights about consumers based on information drawn from focus groups organized by neuromarketers are likely to be of questionable value because these samples are small and not representative of the general population from which they are drawn (Ariely & Berns, 2010). Even neuroscientists have expressed concern about the fact that they have relied on small convenience samples for the development of their insights about the nature of human information processing and associated behaviors (Falk et al., 2013). However, as we will discuss, concerns about the representativeness of samples seem less likely to be meaningful concerns as additional technologies of remote sensing become the norm in marketing.

Classification, Segmentation, and Prediction

Classification—the assignment of persons, places, and things to categories or groups and then treating them or relating to them differently from members of other analytically defined groups (National Research Council, 2013)—is at the heart of our concern about analytics and prediction in relation to marketing.

Bowker and Star (1999) first remind us that "to classify is human," but as they finish their masterful exploration of the ways in which we engage in this activity, they also note that classifications are powerful technologies that have become almost invisible, without losing any of their power to alter the quality of our lives. In offering what they characterize as a pessimistic view of the classifications that are being developed and put into use outside of our awareness and critical reflection, they suggest that "we are taking a series of increasingly irreversible steps toward a given set of highly limited and problematic descriptions of what the world is and how we are in the world" (Bowker & Star, 1999, p. 326).

Population segments identified through analysis are often saddled with classificatory markers that then serve to establish and reinforce negative stereotypes about the members of those groups. As Poudrier (2003) suggests, the generation of categories of healthy or unhealthy behaviors "tend to correspond intimately with moral concepts of good and bad conduct, as well as virtuous and immoral individuals or communities" (p. 118).

Geographers engage in forms of remote sensing (Longley et al., 2001/2005) that share features with those we have identified as increasingly popular among neuromarketers. The incorporation of multiple forms of data in geographic information systems has enabled marketers to develop maps of neighborhoods or cities that use colors to identify areas to avoid as well as those that appear ripe for exploitation (Barreneche, 2012).

An early provider of cautionary tales about implications of the strategic use of geographic information system technology (Pickles, 1995) provided examples of the various ways in which users—ranging from insurance companies basing rates on "zones and localities of risk" to marketers seeking to extend the potential of "direct-mail solicitation to exact marketing" based on "recorded purchasing and general expenditure records"(p. 16)—made use of this rapidly developing resource.

Early work among marketers to characterize the socioeconomic and psychological attributes of the residents in particular types of neighborhoods in the United States made use of “geodemographic” clustering models brought to public attention by Michael Weiss (1988). Weiss described the 40 types of neighborhoods defined by census block groups used to characterize different zip codes around the United States. Although the primary determination of each neighborhood was based on similarity or closeness in terms of sociodemographic attributes of residents, the value of this demographic clustering developed for marketers by the Claritas Corporation was that it allowed the identification of similar clusters wherever they were located. Thus, on a cluster map of the United States, “people who live 3,000 miles apart yet share the same neighborhood type have more in common with each other than with those people who live only three miles away” (Weiss, 1988, p. 6).

Unfortunately, what was developed as support for segmented marketing strategies for political candidates and public policies as well as commercial goods and services also served to reproduce and reinforce a set of stereotypes for these residential segments by providing thumbnail demographic sketches that included race, levels of education, and primary forms of employment and consumption. The labels assigned to these clusters—such as “Hard Scrabble,” “Tobacco Roads,” and “Blue Blood Estates”—underscored their role as markers of status and commercial and political value (Weiss, 1988, pp. 268–392).

We fully expect that neuromarketers will eventually incorporate the identification of cognitive styles and decision-making strategies (Kozhevnikov, Evans, & Kosslyn, 2014) into their efforts to assign neighborhoods, groups, and individuals into differentially valued market segments (Venkatraman, Clithero, Fitzsimons, & Heuttel, 2012). The expected value of these enhanced segmentations is based in part on the expectation that “neuroscience data can indicate implicit processes, improve out-of-sample predictions, improve the generalization of models of behavior, and provide a reliable and process-based approach for segmenting customers” (Venkatraman et al., 2012, p. 146).

With the development of collective databases, such as the Brain Atlas, which made it possible to “store information on how the brain varies across age and gender, across time, in health and disease, and in large human populations” (Van Horn & Toga, 2016, p. 265), we also expect that a greater variety of population segments will be associated with cognitive maps in ways that facilitate their targeting by marketers (Poldrack & Yarkoni, 2016).

Neuromarketers increasingly seek to use experimental research to support the development of strategic marketing initiatives that will be informed by a range of inferences about various population segments. As we have suggested, the segmentation of relevant populations into groups based on their characteristics has been dramatically altered by the development of consumer analytics. Psychographic data, or information about attitudes, tastes, preferences, and types of personalities, have been demonstrated to enhance the predictive power of message strategies that were previously based only on demographics (Sandy, Gosling, & Durant, 2013). Significant improvements in descriptive, predictive, and prescriptive profiles of consumers are likely to be developed with the information derived from neuromarketing research, such that “it may be possible to segment consumers by brain differences that do not directly map onto demographics or psychographics” (Stanton et al., 2016, p. 4).

Consumer Surveillance and Ethical Concerns

As Olteanu (2015) reasons, using neuroimaging in a setting where the overall goal is to sell more products can foreground ethical issues. Indeed, ethical implications emerging from advancements in the technologies and practices used by neuromarketers consistently highlight the potential to manipulate individual decision making. In reviewing a series of studies involving neuromarketing professionals, Hensel, Iorga, Wolter, and Znanewitz (2017) noted that twice as many advertisers considered neuromarketing more efficient than traditional forms of market research, but respondents also claimed that neuromarketers were not as ethical.

Echoing the perspectives we have taken in this article, these ethical issues do not always arise explicitly from data collection, such as the methods and instruments used to conduct experimental research; rather, important ethical issues arise primarily from the way these data are applied. For example, many believe that it would be unethical to use segmentation and targeting tactics to influence consumers without their being made aware of the manipulative strategies and discriminatory goals being pursued. It is suggested that if this kind of "stealth marketing" using advanced neuroscience tools became possible, then it "should be regulated by an ethical code as early as possible" (Hensel et al., 2017, p. 9).

Attached to this view is the concern that neuroscience has the capacity to make advertisements more powerful, potentially creating desires for inferior products and items a consumer might not actually need or be able to afford, or by strengthening desires that consumers have struggled to manage in the past (Grier & Kumanyika, 2010). As a counter, Stanton et al. (2016) reject the claim that neuromarketing can be used to move beyond prediction to actually influence consumer choice. As they see it, predicting behavior is different from applying coercive force. They argue that prediction does not necessarily deny or undermine the rationality of the individual or group whose behavior is being predicted. At the same time, they suggest that experiments "can clearly and causally demonstrate the power of marketing manipulation on consumers' behavior that operates outside of conscious awareness" and that "shaping consumers' choices is the goal of marketing generally" (p. 7).

Yet even after noting that marketing information can "strongly influence their choices, even when the consumers had no conscious awareness that their choices were being influenced" (Stanton et al., 2016, p. 6), this kind of influence is not seen as enough of a basis for imposing an ethical constraint on marketers. For these defenders, control over consumers has to be absolute. "Consumers might have more control when they are consciously aware of what influences them, but that does not mean that they lack all control when they are not consciously aware of what influences them" (Stanton et al., 2016, p. 6). In what seems like a rather extreme view, they suggest that such "physiology-based marketing allows consumer choices to remain free, even if they are significantly influenced by physiological factors that consumers cannot control" (Stanton et al., 2016, p. 7).

Nevertheless, we believe that it is reasonable to claim that targeted communication, designed to influence consumer behavior to varying degrees, is an ungranted influence, the power of which is increasing as insights derived from applied neuroscientific research accumulate and the number of practitioners and applications expands.

Relatedly, while some authors considered the application of neuroimaging to the political environment as a means to "better understand unconscious consumer response and preference" (Olteanu, 2015, p. 192), others viewed such strategies as an ethical violation (Hensel et al., 2017) since altering an individual's decision-making process could be interpreted as an incursion into the right to freedom of thought as a fundamental aspect of one's autonomy (Rouvroy, 2008). This is especially problematic as it relates to the targeting of members of vulnerable groups, such as children, the elderly, and those with physical and/or mental disability (Hensel, Wolter, & Znanewitz, 2016). Although some neuroethicists have argued for the development of more robust regulatory frameworks to protect members of these particularly vulnerable population segments (Farah, 2012), we suggest that it is also important to consider expanding the meaning of vulnerability to include the socially and economically disadvantaged (Grier & Kumanyika, 2010, pp. 355–356; Rogers, Mackenzie, & Dodds, 2012; Shavitt, Jiang, & Cho, 2016).

Despite positive moves to regulate neuromarketing, beginning with increased attention to privacy concerns, direct and indirect surveillance of target populations has yet to become a central focus of public policy debates. When critical observers of developments in neuroscience and its application in marketing consider privacy at all, their attention tends to focus on threats to individual research subjects (Hensel et al., 2017; Olteanu, 2015; Stanton et al., 2016). The primary emphasis in defenses of neuromarketing is that there are no privacy threats to the majority of populations because they are not the actual or direct subjects of laboratory experiments involving brain scans (Stanton et al., 2016, p. 5). But few deny that many consumers are the direct or indirect subjects of market tests or campaigns informed by those experiments, for which no informed consent has been sought.

Unfortunately, group privacy is still a marginalized concept (Taylor, Floridi, & van der Sloot, 2017), and apprehension about the gathering of strategic intelligence by means of remote sensing by neuromarketers is limited to concerns about advances in technology that would enable the direct gathering of information from an identifiable individual (Farah, 2012, p. 578).

Conclusions

Among a number of ethical implications that we have identified with regard to neuromarketing, we have emphasized those that bear a specific relationship to remote sensing, statistical discrimination, and invasions of privacy. Many of our concerns are related to what we understand as expectations of fairness, including the reasonableness of the expectation that an individual's life chances are not shaped by the stereotypes that have been applied to the groups to which that individual may have been assigned by social, political, or statistical processes.

Related concerns adhere to what legal scholars explore under the heading of due process (Crawford & Schultz, 2014). The absence of informed consent as a constraint on the collection of direct or indirect information about individuals is at the heart of these concerns. As we have suggested, remote sensing technologies ignore any consideration of the legitimate interests of the persons whose life chances have been or are likely to be altered by the delivery of persuasive messages targeted on the basis of predictive segmentation processes (Burdon & Harpur, 2014, p. 696).

Of particular importance with considerations related to fairness are those cases involving the opportunities and limitations individuals face as a result of algorithmically determined scores, many of which are estimations of the levels of risk that are assigned to the groups into which an individual has been sorted (Burrell, 2016; Dixon & Gellman, 2014). Many of us consider it unfair that people who are already burdened by the cumulative disadvantages associated with poverty, racial and ethnic discrimination, and other extremes of categorical vulnerability are likely to be burdened further by additional classifications and predictive assessments of the behavioral choices they are considered likely to make (d'Alessandro, O'Neil, & LaGatta, 2017). Monahan's (2017) notion of "marginalizing surveillance" fits well within the scope of neuromarketing research and its pursuit of market segmentation, because, as he sees it, "through categorization and sorting, surveillance enacts forms of structural violence against marginalized Others" (p. 192).

It is especially unfair if neuromarketers are able to make use of the kinds of additional information they will obtain from experiments and analytics to influence the behavior of consumers in ways that limit, rather than improve, their life chances (Murphy et al., 2008, p. 299; Popescu & Baruh, 2017).

Privacy scholars have been especially concerned about the impact of strategies adopted by powerful actors to make use of knowledge about the general public and certain segments to influence their decision making. These concerns include the loss of autonomy as a vital dimension of social, economic, and political self-determination (Calo, 2014; Cohen, 1996). Fortunately, there are signs that policy makers in the United States are beginning to pay more attention to the role of context as a basis for consumers' expectations of privacy. These policy makers are also routinely including corporate actors along with government agencies as targets of interest in their efforts to manage unease about big data analytics and the discriminatory impacts of its use (White House, 2016). We also note the role that increased awareness of the nature and scope of inequality plays in the public sphere. In this regard, we are hopeful that consideration of the function and implications of remote sensing in general, and with special attention to its use by neuromarketers, will help shape future debates about how current trends in inequality can be reversed.

The place of neuromarketing in these debates must be framed in a way that emphasizes the power dynamics in an industry that has the potential to shape the life chances of individuals as members of already disadvantaged groups. It is reasonable to suggest, then, that a path to addressing these issues should be pursued through governmental bodies, interdisciplinary groups of researchers, practitioners, and diverse publics that will become actively involved in formulating strategies for the regulation of the discriminatory use of diagnostic technologies in marketing.

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