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Abstract

Traditional methods of marketing (via focus groups, market research organisations and so on) have numerous limitations; these are mainly related to the degree of subjectivity of consumer responses, which often prevents measurement of the effects of marketing communication on them. The objective of this chapter is to highlight the influence that a new line of marketing—neuromarketing—has on consumer decisions, allowing managers to directly understand the thoughts, emotions and intentions of consumers. Going beyond a description of the concept of neuromarketing proposed in the literature, the chapter details the parts of the brain on which advertising messages act, thus highlighting the impact of neuromarketing on consumer choices. The results of the research highlight the positive effects of neuromarketing on the measurement of consumer behaviour, providing important theoretical and managerial implications.

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Neuromarketing in Customer Behaviour—Customers' Diencephalic and Mid-Brain Implications in Purchase Dynamics

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1 Introduction

The capacity to evoke an emotional answer through an advertisement or another communication instrument is one of the main aims of marketing. However, it is not easy to measure or quantify emotions. This problem has led marketing scholars to elaborate new models of utility and individual rationality (Tornati 2012).

Normally, the routine of a purchase in a customer's mind starts from a need for a product and arises as *think-perceive-buy/don't buy*. However,

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16 this process does not always proceed so simply (Tekin et al. 2017). In
17 fact, often people do not really need a product or service, and the deci-
18 sion is made through other mechanisms, without rational influence.

19 Managers are always researching factors based on attitude and con-
20 sumer behaviour that can provide a competitive advantage. Traditionally,
21 marketing and advertising scholars have utilised research based on focus
22 groups to obtain answers about products and brand communication, but
23 market change requires new technologies to understand consumers'
24 minds scientifically. Over the past few years, researchers have developed
25 different neurophysiological methods to analyse consumer behaviour and
26 the effects of advertising, with the aim of clarifying different aspects of
27 marketing (Yadava et al. 2017).

28 Developments in the neuroscientific field have shown that emotions
29 are the fundamental basis from which the thoughts, behaviours and
30 actions of individuals arise (Tornati 2012). As a result, there is increased
31 interest in an approach based on the brain itself and on the relation
32 between consumers' behaviour and their cerebral activity (Hsu 2016;
33 Poels and Dewitte 2006; Potter and Bolls 2012). This is neuromarketing,
34 an emerging field that completes studies about consumer behaviour with
35 neuroscience; it is changing the way in which brands (such as Campbell's
36 Soup and Pepsi) communicate their products and improve their image
37 (4impring.com), always to gain better credibility.

38 The main problem for producers of various goods and for managers all
39 over the world is to predict whether their new products will be attractive
40 to consumers, whether the suggested price is acceptable, and whether the
41 marketing communications are effective (Gazdzik 2017). Qualitative
42 research, such as a focus group interview or blind taste test, is always
43 based on self-reports, where the answers given during the interview rep-
44 resent the main way to learn which product, taste or commercial is
45 accepted. This type of methodology makes one important assumption:
46 consumers never lie. In practical life, this hypothesis is wrong, because
47 consumers lie and sometimes respond with expressions of worries and
48 prejudices. It is believed that studies performed in this field are realist,
49 scientific and more reliable (Tekin et al. 2017). Moreover, during focus
50 group interviews people reveal attitudes—influenced by a strong person-
51 ality, for example—that make the research unreliable. For these reasons,

it is clear that individual responses are not independent of one another (Gazdzik 2017).

Neuromarketing overcomes the limits of conventional methods to test and forecast efficiency in advertising investment (which often fail because they depend on consumer availability and competence to describe how an advertisement feels), offering a cutting-edge methodology to directly probe consumers' minds without requiring demanding cognitive participation (Morin 2011). Neurotechnologies and neuroimaging techniques have the capacity to study the frequency, location and timing of neuronal activity to an unprecedented degree (Bakardjieva and Kimmel 2017; Lee et al. 2007). Neuromarketing uses neuroscience to determine how consumers are affected by variations in product design, packaging and in-store displays; why consumers prefer some products and brands to others; and to what extent advertising content and execution has an impact on them (Bakardjieva and Kimmel 2017; Nobel 2013).

The aim of this chapter is to show, through a deep examination of the literature and results obtained, how the main methodology utilised in neuromarketing can contribute significantly to the efficiency of commercial advertising messages, while also providing managerial and theoretical implications to scholars and managers. The present work adds value to previous studies in the neuromarketing field because it not only sets out the current state of the literature on the research topic but also analyses two practical cases, the first two famous brands in the beverage industry and the second tourist websites, where consumers' decision-making is driven by both positive and negative emotions. In this way, it offers a managerial explanation about the usefulness of neuromarketing techniques in customers' decision-making processes.

2 Review of the Literature

When a firm has a product to promote, one of the issues it must face is to create an advertising campaign. The challenge is to act in a market with more and more different competitors and tackle difficulties concerning reaction time, diversification of the product and the competitor's defences (Nyoni and Bonga 2017b). Ninety-five percent of customers' decision-

85 making process occurs in the subconscious, and neuroscience could pro-
86 vide good support to better explain this process, showing the reasons for
87 customers' purchase actions (Dooley 2011; Nyoni and Bonga 2017a;
88 Ramsoy 2014; Zaltman 2003). They are not "simple", as Muth's rational-
89 choice model indicates (Muth 1961), but are complex and intercon-
90 nected (Nyoni and Bonga 2017a). Recent research shows that even if
91 cognitive decisions seem to be rational, they are not. In fact, emotions
92 take over and affect the results (Hazeldine 2014). The brain is a "black
93 box" in which emotions and customers' preferences are hidden, and neu-
94 roeconomics is the "window" that links the decision-making process with
95 the real neurological processes of the subject analysed (Fisher et al. 2010;
96 Green and Holbert 2012; Ohme and Matukin 2012).

97 The importance of neuromarketing is clear: this multidisciplinary sci-
98 ence prevents the customer from twisting the message of the advertise-
99 ment, jeopardising the campaign results (which could be different from
100 the one hoped for). This explains the high failure rate of marketing cam-
101 paigns (Hilderbrand 2016). From 2005 to 2015, a growing interest
102 within marketing research emerged in the movement away from self-
103 reported consumer research towards the use of direct neuroscientific
104 methods characterised as neuromarketing. However, interest in neuro-
105 marketing has decreased in the last five years, particularly since 2017.
106 Countries where trends of interest are greater are Perú, Colombia and
107 Guatemala. Italy is at the 29th place out of 62 (Google Trends 2018).

108 Many things still need to be understood about neuromarketing. Some
109 studies have been conducted to gather data about the number of matches
110 and the differences in the number of heat points among the study popu-
111 lations per quadrant of a website (Boz et al. 2017; Štrach and Slivkin
112 2017). Both Boz et al. (2017) and Štrach and Slivkin (2017) have high-
113 lighted the practical applications in the field of cross-cultural web design
114 and business research in two important studies. The first involves map-
115 ping cross-cultural differences in the manner of a business-to-business
116 website assessment (Štrach and Slivkin 2017); the other is a tourist web-
117 site (Boz et al. 2017). Firms use this tool more and more not to influence
118 customers' minds (as many people claim) but to create a better promo-
119 tional campaign for the customer using the traditional marketing chan-
120 nels (Glaenger 2016).

Neuromarketing seeks information and insights via traditional techniques such as surveys, focus groups, experiments and ethnography. Its goal is to enhance marketing theory and practice (Plassmann et al. 2015; Yoon et al. 2012) or to improve the accuracy of predictions of consumer preferences and behaviour when combined with traditional techniques (Boksem and Smidts 2015; Smidts et al. 2014; Venkatraman et al. 2015). Researchers use technologies such as functional magnetic resonance imaging (fMRI) and electroencephalography (EEG) to measure specific types of brain activity in response to advertising messages. With this information, companies learn why consumers make the decisions they do and what parts of the brain motivate them to do so (Ghorpade 2017). According to Nick Lee, Honorary Professor of Marketing and Organizational Research, Aston University, “Executives love the idea of using brain scans. As brain imaging and neuroscience develop, Neuromarketing companies will be able to pull out more sophisticated data about what makes people want to buy or avoid certain items. The big question is whether Neuromarketing can push a ‘buy-button’ in your brain.”

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The major gap we can find here is the scarce application of neuromarketing techniques (Feenstra and Pallarés-Domínguez 2017). While some sceptics and detractors describe neuromarketing as a sort of “brain washing” (Ghorpade 2017), its techniques could allow us to form a reliable view of how companies deal with ethical issues (Feenstra and Pallarés-Domínguez 2017). Threats to consumer autonomy, privacy and control are not meaningful ethical issues given the current capabilities and implementation of neuromarketing research (Stanton et al. 2017). Neuromarketing has clear potential for making a positive impact on society and consumers, a fact rarely considered in the discussion on the ethics of neuromarketing (Stanton et al. 2017) by firms, which prefers to limit or completely avoid this powerful instrument of monitoring. It is easy for businesses to keep track of what we buy, but harder to figure out why (Ghorpade 2017). Neuromarketing will cover this important gap, with effective practical and managerial implications.

Another important limitation for firms is the high costs of using neuromarketing. In fact, an fMRI machine can cost as much as \$5 million, while a single advertising sample group of 20 people can cost only around

157 \$10,000. Thus, by necessity, true neuromarketing is used primarily by
158 large companies and organisations such as Google, Microsoft, Frito-Lay
159 and the Weather Channel (Ghorpade 2017).

160 Having analysed the principle academic sources, we now move on to
161 the methodological heart of this chapter.

162 **3 Methodology**

163 This research emphasises the role of neuromarketing in the study of cus-
164 tomers' behaviour, answering two main research questions:

165 RQ1: What are the principle tools used to analyse brain activity?

166 RQ2: What are the effects of neuromarketing in the study of customers'
167 behaviour?

168 These questions are answered through a detailed examination of the
169 literature and empirical results obtained concerning how neuromarketing
170 techniques used in advertisements can influence customers' behaviour.
171 They concern methods for the analysis of brain activity, the areas affected
172 by advertisements and their influence on customers' behaviours. This
173 review emphasises the active role of neuromarketing this and also
174 describes important management applications in the field of marketing.

175 **4 The Main Methods for the Analysis** 176 **of Brain Activity**

177 We will examine the identification of brain areas in which specific stimuli
178 operate and, in particular, the role of the mid-brain and the diencephalon
179 (especially the amygdala) in specific customers' behaviour trials. The most
180 common methods for the analysis of brain activity subjected to stimuli
181 are electroencephalogram (EEG), positron emission tomography (PET)
182 and fMRI or magnetic resonance imaging. These brain imaging tech-
183 niques (PET and fMRI) differ in their spatial resolution capacity. Other

techniques sometimes used are eye tracking (used to trace the movement of the eyes, clarifying which points of the image are considered of greatest interest) and biometric measurements used alongside EEG.

Generally, these results are used to understand the level of attention generated by the stimulus and the level of emotional involvement—that is, if customers have positive reactions to the stimuli and how much the stimulus is remembered, as measured by the level of conservation of the memory. From these data, it is possible to gather additional information: (1) whether there is an intention to buy a product; (2) how much the proposed product stands out over the competitor's; and (3) the awareness of how much the stimulus is able to communicate efficiently. All these theories are explored through empirical studies.

A study carried out on a sample of 30 university students (15 women and 15 men) relating to the projection of different commercial videos brings to light some important insights. In the first ten seconds, the EEG revealed no electric reactions of the brain, but then the scenes regarding value (specifically, family unity) caused some positive brain effects in the subjects analysed. The scenes directed only at the males generated negative effects in the females, whereas the scenes with supernatural elements or with cloudy colours did not arouse particular interest (Tekin et al. 2017). Here it is possible to see different behaviours from women and men subjected to an EEG test. Women tend to be more influenced by hedonistic scenes than men (Lucia-Palacios et al. 2017). The same behaviour was seen in studies on shopping, revealing that females are more affected by stimuli from the external environment (Borges et al. 2013; Kaltcheva and Weitz 2006; Lucia-Palacios et al. 2017; Wirtz et al. 2000).

Moreover, Suomala et al. (2012) proved how neuromarketing is an important tool to reveal the activation of the brain during customers' engagement, using EEG and fMRI. The study involved virtual travel based on the advisory sale process using a brain scan. Specifically, video clips and photographs taken from a sales process at Nokia flagship stores were presented to 16 subjects, whose brain activity was scanned. The subjects were able to associate themselves with people and video events, and they felt safe during the consultative sales process. This demonstrated that the laboratories are virtual environments similar to the sales environments, where consumers can participate in the buying process and

220 respond to events represented on the screen. Neuromarketing here is
221 important for gaining consumption information not extrapolated from
222 other sources.

223 EEG is a more accessible, economical and less invasive test, even if it is
224 able to record only the most superficial signals (Costa Rozan Fortunato
225 and de Moura Engracia Giraldi 2014). In a famous experiment con-
226 ducted by Daimler Chrysler, Henry Walter scanned the brain activity of
227 12 young men with fMRI while showing them 66 black-and-white pho-
228 tographs of sports cars, sedans and utility vehicles, highlighting a particu-
229 lar activity of the nucleus accumbens in the brain due to the activation of
230 dopamine at the sight of sports cars. The object of dopamine release has
231 been traced back to the desire for the perceived sports cars. That desire is
232 connected to the perception through advertising that sports cars are
233 highly desirable by men. In his book *Buyology*, Lindstrom (2008) explains
234 a study carried out to demonstrate how labels related to the positive
235 effects of cigarettes are identified as a visual stimulus for smokers and how
236 they encourage them to consume more; instead of stopping their desire
237 to smoke, they function as an advertising message that stimulates desire
238 itself in the nucleus accumbens, the area of the brain that anticipates
239 pleasure.

240 An interesting study was conducted by Barbasso et al. (2015) to under-
241 stand which packaging could allow consumers to give an added value to
242 the product, irrespective of its cost. The study involved 24 participants
243 between the ages of 24 and 40 with different levels of schooling using two
244 brain imaging tools, fMRI and magnetoencephalography, put into action by
245 magnetic fields determined by the electrical activation of the brain
246 (Zurawicki 2010). These two techniques have made it possible to identify
247 the cortical areas activated in relation to particular behaviour or con-
248 sumption experiences (Gazzaniga 2004) and to demonstrate how a fun-
249 damental component in the perception of the value is the packaging or
250 the appropriateness of the packaging in the environment in which it is
251 intended to function.

252 The studies performed through the use of eye tracking have shown
253 how it is able to measure the consumer's focus attention, the scheme of
254 visual behaviour of fixation of gaze, pupil dilatation, and the focus and
255 micro-focus, but it does not allow us to understand which emotions are

associated with the areas considered as a focus of attention (Costa Rozan Fortunato and de Moura Engracia Giraldi 2014). Studies conducted on PET lead back, in terms of validity, to fMRI, even though radioactive positrons can pass through the participants to collect the results, making this technique highly invasive and difficult to use in neuromarketing (Lin et al. 2010).

5 Sectors of the Brain on Which the Advertising Message Acts: The Experiments Conducted

Even though our mind greatly influences our actions, many sectors of our brain remain unknown. A study by John O'Doherty of the California Institute of Technology's Psychology and Social Sciences Division determined how advertising acts on the centres of pleasure, gratification and anxiety. The areas involved in the basic operation of advertising were the mid-brain and diencephalon, centres of pleasure/gratification and pain, respectively, the same that are involved in drug addiction and some psychiatric illnesses. The reaction of our brain when we see an advertisement is characterised by the association between stimulus and product. The advertisement works by simply providing a stimulus and associating it with a product.

Thanks to the utilisation of magnetic resonance, it was possible to see the activity of the diencephalon and the mid-brain in a group of volunteers and to evaluate their reactions to being offered juice. After recording the subjects' preferences, neurologists created a visual stimulation related to their flavours. They could see the brain activity due to the control of the open zones, checking the consistency with the initial statements. The neurologists noticed that the mid-brain had more intense activity when stimulated using the subject's favourite flavour. However, the diencephalon reacted with up and down fluctuations when stimulated using their favourite or their hated flavour. Therefore, the neural activity in these areas faithfully reveals subjects' preferences and individual choices. The limbic system is a part of the diencephalon and is composed of a series of

288 brain structures and a set of neural circuits that are in the deepest and
289 oldest part of the telencephalon linked by the limbic system. This system
290 is involved in the integration of emotions, mood and the sense of self-
291 awareness that determines the individual's behaviour. The limbic lobe,
292 the hippocampus, the previous thalamic nuclei, the limbic bark and the
293 amygdala could garble human behaviours and mood.

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294 The amygdala is well connected to the cerebral cortex, which regulates
295 relations with the outside world. Some senses are directly connected with
296 it, so we sense smells with the amygdala before that information can
297 reach more evolved parts of our mind. In this sense, the ear emotion (an
298 instinctive function of the amygdala) could give us some advantages in
299 the decision-making process to the point that automatic answers caused
300 by the fear could be stronger than our rational ability to voluntarily
301 inhibit them. The amygdala is also the centre of anxiety. Breaking down
302 customers' anxiety (generated by the amygdala) with coherent advertise-
303 ments and being able to check this through fMRI analysis leads to new
304 horizons in the area of in-depth knowledge of purchasing dynamics,
305 reevaluating the role of neurological marketing processes.

306 **6 Amygdala: All Emotions Depend on It**

307 Tears are an emotional signal exclusive to human beings and are stimu-
308 lated by the amygdala, which conserves emotional memory. Our emo-
309 tions have a brain that takes care of them, which can be different and
310 independent of the opinions of the rational mind. A study by Drazen
311 Prelec and George Loewenstein (an economics and a psychology profes-
312 sor at the University of Carnegie Mellon) concluded that the worst way
313 to sell a product is to increase the price while increasing the amount
314 consumed. This process creates mental pain, a pain in the brain areas
315 associated with physical pain. In every context, buying more and more
316 products immediately caused a sense of pain associated with the instant
317 awareness of how much the customer will pay (a potential loss of
318 purchase).

319 This strange brain conformation also explains other theories such as
320 loss avoidance. Creating a bundle is a strategy that currently enjoys

success, and we know why through the analysis of neuromarketing. 321
We know how difficult it is to sell single products, with each one dis- 322
tinguished by pricing. It becomes easier to create a bundle where the 323
price of every product will flow into a discounted one. 324

Finally, neuromarketing methods can also be applied in the area of the 325
memory. Starting from the awareness that storage is connected with 326
future purchase behaviour, neuroscientific studies have focused on the 327
measurement of both explicit (or declared) memory and implicit mem- 328
ory, which is recorded by neuromarketing indicators and does not reach 329
the subject's consciousness. The implicit memory was also studied in rela- 330
tion to the effects of subliminal messages able to influence customers' 331
preferences (Chartrand et al. 2008). 332

7 Case Studies 333

7.1 Coca-Cola or Pepsi in a Consumer's Mind? 334

Studies show that as much as 95% of all consumer purchases of products 335
and services may be impulse purchases (Koc and Boz 2014a, b). In this 336
chapter, we analyse the reactions of the consumer's mind to both a prod- 337
uct (a famous beverage) and a service. We start with one of the most 338
compelling neuromarketing studies about a product, which was con- 339
ducted by McClure et al. (2004). The researchers monitored neural activ- 340
ity when subjects were drinking either Coca-Cola or Pepsi. McClure 341
et al. (2004) used an fMRI experiment with two conditions: (1) a blind 342
taste test; and (2) brand-cued delivery. With the blind taste test, brain 343
activity between Coca-Cola and Pepsi was nearly identical. However, in 344
the brand-cued condition, dramatic differences were found in neural 345
activity, primarily in the ventromedial prefrontal cortex. The important 346
finding was that no neural activation differences were found when no 347
brand information was available, but when brands were known, brand 348
familiarity and product preference came into play. Coca-Cola was found 349
to be generally preferred by the participants and caused significantly 350
more activity in the ventromedial prefrontal cortex. One key aspect of the 351

352 study is that no choices were actually made by the participants; the drink
353 was delivered directly to the participants in the fMRI in small quantities.
354 The manipulation was based on whether the brand was announced first,
355 and the finding is based on the resulting activated regions, as measured by
356 the fMRI.

357 Koenigs and Tranel (2008) explain that there is a “Pepsi paradox”,
358 which essentially explains that in a blind taste test, subjects tend to prefer
359 Pepsi over Coca-Cola, or have no reliable preference, yet Coca-Cola con-
360 sistentlly outsells Pepsi. The paradox is that when brand information is
361 available, Coca-Cola is preferred, but when brand information is not pro-
362 vided, no reliable preferences can be made. In McClure et al.’s (2004)
363 study, cola preference was counterbalanced. Koenigs and Tranel (2008)
364 confirm predictions from previous correlative data by using subjects with
365 prefrontal cortex damage, finding that even when these participants are
366 presented with brand information, it makes no difference in their prefer-
367 ences. Thus, this finding mirrors effects found in normal individuals in
368 blind taste tests, as well as under their own blind taste test conditions.

369 **7.2 Tourist Website: How to Choose a Destination?**

370 The second case study involves the tourism sector, which is closely linked
371 with a rise or decrease of prices. Pricing is often used as a competitive
372 advantage tool in tourism in a number of ways to try to influence con-
373 sumers’ purchasing patterns (Swarbrooke and Horner 2007, p. 166).
374 When consumers are looking through a brochure to select a journey, the
375 emotional response is a significant determinant of destination choice
376 (Boz et al. 2017). The study of Bigne and Andreu (2004) showed that
377 tourists experiencing higher pleasure were more likely to be satisfied,
378 loyal and less price-sensitive. Qui and Wu (2005) conducted an experi-
379 mental study on the influence of cognitive styles and negative emotions
380 on tourism decision-making. While cognitive styles were not influential
381 in decision-making, negative emotions were.

382 On the other hand, perceived risk motivates intensified information-
383 seeking (Witt and Moutinho 1995) and makes the design of marketing
384 communications messages a significant task in the tourist industry (Boz

et al. 2017). Tourism decisions involve large emotional investments, due to the fact that a great majority of people may have only one opportunity to go on a trip in a year. If a trip goes wrong, there is not another opportunity for another year; therefore, the fear of failure is high and the opportunity cost is irreversible (Koc 2004, p. 88). Although the risk element of services is generally high for consumers, the decisions related to tourism may cause higher risk perception among consumers for than other services.

8 Conclusive Reflections and Implications

From these reflections, it is noted how neuromarketing techniques could be useful to gain a more appropriate valuation of the efficiency of communication. Berns and Moore (2012) showed that the rating of declared preferences and the forecasts of success of a new commercial song list replaced traditional survey techniques that significantly differed from the market data, while analysis carried out with neuromarketing techniques was more predictive and efficient in identifying which techniques would be successful. These results reveal some important theoretical and managerial implications.

From the theoretical point of view, neuromarketing presents the opportunity to overcome the subjectivity characterising more traditional marketing tools used to analyse customers' behaviour (for example, focus groups) by providing objective scientific data. From the managerial point of view, neuromarketing ensures the possibility of measuring objectively the effect of some advertising campaigns, advertisements, brand images and so on. However, it should be noted that, among the neuromarketing techniques, fMRI is preferred by scientists and firms. EEG is also commonly used to determine the effect of all elements of television advertising. The techniques less used are PET, which is highly invasive; magnetoencephalography, which is not suitable for measuring the deepest subcortical and cerebral areas and is only possible with very expensive equipment; and eye tracking, which does not allow for an understanding of the emotions associated with the areas that we are focused on.

417 Neuromarketing and its tools represent a modern and expanding field
418 that generates intense debate concerning ethical principles and the accu-
419 racy of its use; these sometimes relates to increasing dangers and possible
420 abuse. This work presents a “state of the art” assessment related to the
421 influence of neuromarketing on customers’ behaviour that could be sup-
422 ported in the future with specific empirical analysis carried out on cus-
423 tomers from different sectors and geographical areas. Neuromarketing is
424 a new way of studying marketing; if it is correctly used with particular
425 attention to ethical principles, it could help marketing operators under-
426 stand how to present and sell products more efficiently. In particular, it
427 could become a useful support for marketing applications to find the
428 correct audience for a particular product (Glaenger 2016). In conclusion,
429 a thorough understanding of brain cognitive mechanisms could find
430 answers to many questions in the field of marketing (Costa Rozan
431 Fortunato and de Moura Engracia Giraldi 2014).

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Uncorrected Proof

Author Queries

Chapter No.: 2 0003948323

Queries	Details Required	Author's Response
AU1	Please confirm the author affiliation details.	
AU2	In the sentence beginning “However, interest in neuromarketing”, could you say why this decline in interest has occurred?	
AU3	In the sentence beginning “Some studies have been conducted ...”, could you say what you mean by “heat points”?	
AU4	Could you add a source reference for the quotation from Nick Lee?	
AU5	In the sentence beginning “The limbic lobo ...”, it is not clear what you mean by “garble”. This word means “speak unclearly”. Could you use a more appropriate word here?	
AU6	Please cite Cascio et al. (2015), Chater and Loewenstein (2016), Evers et al. (2014), Madan (2010), O’Doherty and Bossaerts (2008), Plassmann et al. (2008), Prelec and Loewenstein (1998), Roth (2013), Sola (2013), and Wunderlich et al. (2009) in the text.	