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Ethics in Consumer Neuroscience: A Non-Exhaustive Presentation

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Abstract
Social sciences have always been subject to ethical considerations, from research to explicit use and implicit meaning of their findings; Consumer Neuroscience has vigorously developed over the last twenty years and associated ethical concerns have promptly come into the picture. As the effectiveness of the existing neuroscience tools and techniques is just being discovered by researchers in most social sciences, I hypothesize that associated ethical issues will become more prominent in the future. The current article does not attempt to provide an exhaustive view of these issues and possible solutions; it just tackles some of the most important ones differentiating between those specific to Consumer Neuroscience and those rather common for most other social sciences. From this standpoint, large differences were found when analyzing research objectives, instruments, data disclosure, and findings dissemination and use as well as participants' protection and data privacy rights. The framework of the Neuromarketing Science and Business Association (NMSBA) proposed Code of Ethics was used as a starting point for this material, which provides a brief assessment of the current state of each principle put forward by the Code based on an extensive literature review. Although this Code's provisions are quite similar to the ones put forward by the European Charter for Researchers of 2000, European Commission's Ethics in Social Sciences and Humanities of 2001, and several national-level regulations, it was the first choice for this study as it comes specifically from researchers and practitioners in Consumer Neuroscience. Finally, the current paper shall argue for a balanced and realistic approach when attempting to regulate the domain, ensuring the rules effectively protect the participants and users while not unnecessarily increasing research difficulty. As Neuroscience approaches are increasingly accepted by Marketing and other social sciences, a sound and functional ethical foundation would help safe, fair, and fast advances rather than allow for abuses or constitute unnecessary impediments.

Keywords: Neuromarketing, Ethics, Consumer Neuroscience.

JEL classification: M31, M38, M39.

Introduction

Professor Ale Schmidts is credited with being the first to use the term Neuromarketing in 2002 (Ramsøy, 2015); in 2008, there were more than 800,000 Google entries for this term (Hubert & Kenning, 2008), and in 2022 the number went to 4.7 million (Jansson-Boyd & Bright, 2024). In 2024, the 7.3 million entries for Neuromarketing are joined by 39.7 million for Consumer Neuroscience, the academic version. Moreover, a high number of prestigious academic journals consistently publish articles falling in the Consumer Neuroscience area; their primary classifications range from General Science to Marketing, Neuroscience, and Psychology, while some journals with the primary classification of Consumer Neuroscience and Neuroeconomics became widely accepted as part of the top tier about content value and scientific rigor (Ramsøy, 2015). As for the academic articles in the field, a rough estimate is more than 10,000 in 2024 as compared to 800 per year between 2012 and 2014 (Ramsøy, 2015). Together with the increasing adoption of Neuromarketing in the business world based on its certain advantages (Byrne et al., 2022), we could safely conclude that Neuromarketing and Consumer Neuroscience will strongly develop in the years to come. Given the cost-benefit ratio concerns implicit or explicit in EU and other Codes, in many cases it could even be argued that it is a lack of ethics to disregard available methods of superior efficiency.

The above-mentioned development was far from smooth, though, and the main obstructing factors came exactly from the Ethics area (the other main obstacles - lack of knowledge, decreased neuroscientists' propensity to share and traditional marketers' reluctancy to acquire and to be associated with this knowledge, are strongly related to the ethical part, as I shall show later). James Vicary's false claims on the effectiveness of subliminal advertising in what is now widely known as the Popcorn Experiment of 1957 was just one of the early moves contributing a great deal to the distrust Neuromarketing has experienced for decades. Ironically, subsequent research (Pessiglione et all., 2008, Monahan, Murphy and Zajonc, 2000) proved undoubtfully the strength of subliminal associations and subliminal stimuli exposure effects, but a lot of work had to be done to counterbalance the negativity brought by Vicary's conduct. Also, between Vicary's claims and the time he admitted he had invented the data and had never made the experiment, little to no discussion was made if using subliminal stimuli is ethical in the first place. Overpromises of the Buy-button fed the greed and further disappointment of users, the suspicion and fear of buyers, and the reluctance of most traditional Marketing academics to investigate the new area.

Several professional associations have emerged with the purpose of promoting higher standards in the area while others included Consumer Neuroscience in their domains of interest: Association for Neuroeconomics, Association for Consumer Research, The Marketing Society, and Association for NeuroPsychoEconomics. William Safire is credited with having coined Neuroethics with today's meaning (Safire, 2002). One of the most representative and with a major preoccupation in Ethics is the Neuromarketing Science and Business Association (NMSBA, n.a.); it proposes – asks all its members to adhere to – a decent Code of Ethics (NMSBA, 2012), it does include some of the world's leading performers in the domain among members from a large number of countries; nevertheless, it has failed so far to include many other top organizations and professionals in the Consumer Neuroscience field (members of other organizations), unites just a tiny part of all the participants and the proposed Code stays at principles level. As we shall see, in many areas, the impact on the overall professional practice is minimal. Moreover, researchers and organizations operate within distinct national frameworks and profession-specific regulations and customs (medical neuro-researchers in the US have different constraints than psychologists in the UK or consumer behavior researchers in Australia). It is but normal for their Code of Ethics to become quite difficult to harmonize. Moreover, while some researchers in various legislations have virtually no formal ethical constraints, some other areas (especially, medical) are overly regulated; if the Neuroscience consumer researchers eventually abide by the latter, in my view, they will miss the sound reasons prompting the health professionals to do so, while too loose/heterogenous regulation of today allowed the appearance of the unacceptable situations we shall present later.

2. Normative vs. current situation in Consumer Neuroscience Ethics

2.1. NMSBA Code of Ethics

The material will focus on the areas where current practice differs alarmingly from the Code's provisions, while briefly mentioning the others. NMSBA's Code (NMSBA, 2012) is supposed to address three issues, namely a) to restore public confidence in Neuromarketing researchers and practices, b) to ensure the neuromarketers protect participants' privacy, and c) to protect the users of Neuromarketing services. As one can already see, participants' protection is basically confined to privacy rights (although the legal provisions of GDPR cover this part pretty well), while physical and emotional protection is totally disregarded, as we shall see going through the other articles, and gain a second level of concern, although explicit, in the European Commission material and in virtually all the articles and national regulations. In my view, this situation stems specifically from the fact that traditional research methods in

Marketing, as in most other social sciences, are considered to present a very low harmful potential for the participants, as stated explicitly in the European Commission's Ethics in Social Sciences and Humanities of 2001 European Commission, 2001). Nevertheless, as new methods and instruments are borrowed and adapted by Consumer Neuroscience from Neuroscience, Medicine, and other disciplines, additional care should be paid to practices presenting increased harmful potential for innocent participants.

Participants' protection is specifically addressed within Article 2 of the NMSBA's Code of 2012: INTEGRITY: a) Researchers shall take all reasonable measures so that participants are not harmed, b) Researchers shall not deceive or use exploit participants' lack of knowledge, c) Researchers shall make no associated sales offer and d) Researchers must be honest on their knowledge. It is also addressed by several points within various articles and within a specific article (Article 7: PARTICIPANT RIGHTS which regroups the previously stated provisions) It is also worth mentioning that the Neuromarketing Methods presented by NMSBA are of minimal risk (i.e., according to ESRC Framework for Research Ethics, 2015, being no higher than the ones encountered in normal, daily situations) – EEG, Eye-tracking, fMRI, Implicit measures (Implicit association tests), Biometrics (based of physiological responses to stimuli), and Galvanic Skin Response.

Nevertheless, many top researchers in the field include in the Neuromarketing tools set techniques of a much higher harm potential; moreover, as we shall see, these tools are in most cases less efficient than others widely available and of minimal risk. I will focus on 1) Positron emission tomography (PET) and 2) Brain activity modulating methods – Transcranial direct current stimulation (tDCS) and Transcranial magnetic stimulation (TMS).

1) PET is more often than not mentioned as a legitimate Consumer Neuroscience method (Plassmann et al., 2007, Ramsøy, 2015, Treadway et all., 2012). Although several organizations and researchers pointed out the invasive nature of PET which disqualifies it as a method of minimal risk, its technical limits and high financial costs (Jansson-Boyd & Bright, 2024), articles conveying its legitimacy in Consumer Neuroscience keep being written (Alsharif et all., 2023). I shall briefly describe the method in the next paragraphs; as its advantages for the medical area seem obvious (it allows to spot the metabolic rates of various regions and structures), I mean in no way to criticize the use of the method in the medical field. Nevertheless, I share the view that it has little to bring to Consumer Neuroscience to compensate for the risk it presents – participants have to be injected with or inhale a radioactive tracer. There is a long list of tracers used in medicine according to the area to be investigated and the necessary half-life. One of the mostly used in Neuroscience is fluorodeoxyglucose, ^{18}F, with a half-life of 110 minutes – by contrast, oxygen-15, ^{15}O, has a half-life on 122", which poses a lot of constraints on experiment design, given the about 40" necessary to obtain an image of the cerebral blood flow (Jansson-Boyd & Bright, 2024, Armony & Han 2013). Even with ^{18}F, though, the experiments in Neuroscience are severely limited by the long time needed to obtain an image, namely, the same stimuli or type of stimuli must be presented for longer period as opposed to presenting different stimuli in short time intervals. What all these tracers have in common is their radioactive nature; their presence in the blood flow allows radiation detectors to monitor the blood inflows directed to the area of interest, to infer the metabolic rates of those areas and to correlate them, in the case of Neuroscience, with the experienced cognitive and emotional states (as mentioned, PET is mostly – and better – used in the medical field, in domains such as Oncology, Neurology, and Cardiology).

Table 1 presents the main tools available for Consumer Neuroscience researchers for emotional and cognitive states measurement; it takes into account the spatial resolution, temporal resolution, if the tool measure emotion valence and intensity, with what documented

effectiveness, financial costs, and fitness to be used in a non-medical environment on healthy subjects.

Table 1. Main Techniques used in Neuromarketing

Technique	Valence	Intensity	Space Resolution (2)	Time Resolution (3)	Effectiveness	Costs	Fitness (4)
fMRI	Yes	Yes	$<1mm^3$	>3s	High	High	Yes
MEG	Yes	Yes	$<1cm^3$	<1s	High	High	Yes
EEG	Yes	Yes	$<1cm^3$	<1s	High	Low	Yes
PET	Yes	Yes	$>1mm^3$	>>3s	High	High	No
Facial analysis	Yes	Yes	N/A	<1s	Low	Low	Yes
Non-neuro (1)	No	Yes	N/A	>3s	Low	Low	Yes
IAT/EAT	Yes	Yes	N/A	<1s	Low	Low	Yes

Source: Data compiled from Ramsøy, 2015, Zhang et all., 2019, Jansson-Boyd, 2024
fMRI – Functional magnetic resonance imaging; MEG – Magnetoencephalography; EEG – Electroencephalography; PET – Positron emission tomography; IAT/EAT – Implicit/Explicit association tests
(1) Include Galvanic skin response (GSR), Pupillometry, Hart rate, and Respiration rate
(2) Size of the smallest detectable voxel of the brain
(3) Time interval between stimuli presentation and instrument's recorded data
(4) It only refers to the risk posed to participants.

As one can easily see in **Table 1**, beyond the invasive nature and earlier mentioned disadvantages of PET, in the Consumer Neuroscience context, the method is inferior to fMRI from both spatial and time resolution. Nevertheless, as these disadvantages may be overpassed (Carson et al., 2024) and the methods may be combined, the main issue is that fMRI resolution is already good enough for Neuromarketing Research, as the known brain areas of interest are much larger than what can be highlighted by a standard scanner. fMRI does give access to deep brain structures (Rugg et al., 2012, Zeidman & Maguire, 2016), and, as long as both fMRI and PET rely on increased blood flow to the activated areas, PET would not be able to improve fMRI time resolution, turning radioactive tracers' ingestion needed by PET totally unjustified. Again, revealing the metabolic rates of small structures within the brain and other parts of the body is probably of high interest in medical diagnosis and treatment, but clearly not so in Neuromarketing endeavors.

2) Brain activity modulating methods – Transcranial direct current stimulation (tDCS) and Transcranial magnetic stimulation (TMS) – constitute another example of practices with a high harming potential to healthy participants. While in the medical field, the methods do achieve great results, mainly by stimulating (as we shall see, they are also used to inhibit neural populations) affected brain areas, overstimulating normally functioning parts of the brain a) poses high risks to participants, b) presents serious ethical implications and c) brings research closer to the deceiving promises of brain performance enhancement commercially offered by unscrupulous sellers. Consumer Neuroscience studies using these methods are indeed rare (I would mention Camus et al., 2009, and Goldman et al., 2011). Still, as some authors encourage researchers to use these methods (Agarwal & Dutta, 2015, Plassmann et al., 2015), I would mention once again that the collected data could be obtained by methods posing minimal risk to participants.

It is true that having the opportunity to observe changes in moods and behaviors induced by various lesions of the brain contributed to Neuroscience development in its infancy. But these lesions appeared as accidents or side-effects of procedures meant at solving other critical conditions. Maybe the first documented case (Bigelow, 1850, then monitored and analyzed to this day (Lena, 2010, Cherry, 2022), the one of Phineas Cage, who was accidentally stroke by

an iron bar going through his frontal lobe, was first presented as a miraculously survival situation with the help of a medical procedure; then, thanks to Cage's 12 years post-accident life, he allowed associating this brain area severe lesions with the recorded mood, personality and superior cognitive functions modifications over time.

We saw earlier that choosing the methods of minimal risk is not of a high concern in social sciences, Marketing included, probably because the traditional ones used to pose not much risk to participants. Today we should have been warned, though, by the case of John Watson himself, founder of the Behaviorist School in Psychology and Consumer Behavior in Marketing. Ironically, Watson was asked to give up his position with John Hopkins University in 1920 in the Puritan America of the early 20th century for having an affair with a young PhD student, Rosalie Rayner, with whom he worked on today's famous experiment known as Little Albert. Watson and Rayner married shortly after leaving John Hopkins, but the important development was Watson's joining Thompson advertising agency, which led to the first steps in what came to be known as Consumer Behavior. Probably not all people would unequivocally condemn today the two for their romantic engagement; it is the experiment, though, that is considered unequivocally unethical. Basically, the two conditioned a little boy – Albert – to develop a phobia for plush toys and furry little pets by associating them with a fear and stress-generating loud noise. And, while several aspects of the experiment would render it impossible under the American legislation of today (such as inducing fear without participant written consent) and other methodological flows make other authors doubt that little Albert actually developed a phobia (Harris, 1979), Watson is still unanimously blamed for making nothing to un-condition Albert while he declared that the induced fear may persist on the long term.

One can imagine that once DCS and TMS were effective in stimulating a participant's various brain areas (i.e., the neurons fire more frequently, the current needed to provoke a firing gets lower, then new synapses may be formed) or in inhibiting them, it is impossible to perfectly undo such developments, and we have no idea if the effects would last for shorter or for longer than in Albert's case; and, unlike the situation where the two methods are used on a damaged brain in the medical field in the attempt to restore its normal functioning, in Consumer Research we start with a perfectly healthy brain and put it at risk for insights we can get safer (see Table 1), even if maybe not that flamboyantly.

The other main source of data in this area came from observing the patients going through a lobotomy surgical operation – a procedure used between 1930 and 1950 mainly to treat epilepsy, schizophrenia, and obsessive behavior, consisting in severing one brain lobe pathways to another – or to others. Many variations were used, mainly separating the frontal lobe from the thalamus, but also the left from the right hemisphere by sectioning the in callosum. Although a comprehensive presentation of lobotomy history is way beyond the scope of the current paper, a brief look into its evolution may provide great insights for the ethical issues we debate on current methods. Lobotomy was widely accepted, led to a Nobel prize for Antonio Egas Moniz in 1949 and to a huge number of deaths and permanent severe impairments, to be abandoned and legally prohibited today in most of the countries. Nevertheless, it was initially considered a legitimate procedure aimed at curing or ameliorating severe health issues, with unintentional side effects allowing for scientific developments. Still, titles and approaches of research articles based on lobotomy at that time have a striking resemblance with today's endeavors based on potentially harmful methods (e.g. Brickner, 1936).

Returning to NMSBA Code of Ethics (NMSBA, 2012), Article 1: Core Principles regards researchers' duties to a) use the highest research standards, b) not negatively impact the Neuromarketing profession and c) not misrepresent or exaggerate the insights. A systematic

review (Fanelli, 2009) of 18 rigorously selected surveys on research misconduct out of 3276 originally obtained indicates the worrying numbers in Table 2.

Table 2. Survey based misconduct in research projects, social sciences and medicine

Researchers know/admit the use of questionable practices	Fabricated data	Other questionable practices
In own research	1.97%	33.70%
In the research of others	14.12%	72.00%

Source: Data from Fanelli, 2009

Note that the percentages in the table does not include the forms of questionable practices (such as plagiarism) that do not distort the scientific truth.

There is no reason to think that the situation in Consumer Neuroscience and Marketing is worse than the one depicted by **Table 2.** It is true that data from Neuroscience instruments are more difficult to obtain and interpret than from the traditional methods of Marketing and other social sciences (they are not more difficult to get than those in the medical world, though). On the other side, they are much more difficult to fabricate, so, as compared to the traditional Marketing, Neuromarketing data are more frequent either correct or completely made up. Unfortunately, as mentioned earlier, misrepresenting and exaggerating what the researcher and his or her knowledge and instruments can do has been much more present in Neuromarketing than in the traditional research.

Article 2 of the Code (NMSBA, 2012) was presented extensively, including a) Protecting participants from harm and stress, b) Not deceiving or using participants' lack of knowledge and d) Participants being honest about their skills. As for the article 2.c), not making sales offers to participants as a result of their implication in the research, the issue is probably not more serious than in the traditional Marketing research projects, as the number of participants is usually much lower in the Neuro context.

Article 3: CREDIBILITY includes a) The requirement that critics or concerns about public Neuromarketing projects to be presented to NSMBA first and b) The requirement for brain imaging researchers to have and disclose a protocol for dealing with incidental findings. In my view, the first point will have little to no impact on domain ethics, given the low percentage of implied entities members of the association and NSMBA no means to deal with such situations, while the second is standard in various national and EU Codes, especially in the medical area.

Article 4: TRANSPARENCY is of a rather eclectic nature, containing four points: a) Strictly voluntary participation, b) Maintenance of a public website while the core members of the research team publish their credentials, c) Clients' right to audit the data collection process and d) Researcher's obligation to include in the research report as many details deemed necessary by the client. In my view, the first point is better suited in other Neuroscience applications, such as Organization Climate Assessment and Organization Development, where employees might feel pressed to participate. The second point may contribute to increasing credibility while the last two exceeds the industry practice and the provisions of other codes.

Article 5: CONSENT also includes four points. While the first and the last should be mandatory in any research – the researcher shall present the participants the tools to be used in plain language, so the consent be not formal, and the participant has the right to withdraw from the project at any time, respectively, the other two are more problematic: according to them, participants shall explicitly express their full understanding of the protocols to be used and the objectives of the study and they should be fully informed about the study before any Neuromarketing technique may be used. In both commercial projects of Neuromarketing and academic ones od Consumer Neuroscience, there are numerous cases in which the subjects are

not to know certain aspects of the project beforehand (name of the client, real objectives of the study or the assumptions of the researcher). These may or must be revealed to the participant after unbiased data collection, and many EU and national regulations have explicit provisions on how to deal with such a situation.

Article 6: PRIVACY, just summarizes in its seven points the GDPR provisions.

Article 7: PARTICIPANT RIGHTS has five points, all of them being reformulations of provisions also included in previous articles.

Article 8: CHILDREN AND YOUNG PEOPLE states that participants under the age of 18 would be used in Neuromarketing studies only with prior consent of their parents or tutors; in this respect, NMSBA Code comes closer to the regulations in the medical field than the ones prevalent in other social sciences and, given the tools used in Neuromarketing, I think it is a very good point.

Article 9: SUBCONTRACTING provides for in advance disclosure if any part of the study is to be subcontracted.

Article 10: PUBLICATION contains two distinct provisions within a single point: first, researchers should differentiate in the public report between the key findings and interpretation; second, a researcher should not associate his or her name with a project he did not directly participate to and whose findings is not able to defend. Although Code of Ethics in other domains do have the provisions for separate opinions, it is true that such a situation is very rare in Neuromarketing.

Article 11: COMMITMENT urges NMSBA members under the sanction of membership termination to abide and to ensure their clients and other parties comply with the Code's provisions. While for many of the requirements of the code this approach is commendable, duty of imposing partner entities all NMSBA requirements would definitely put its members at huge disadvantages for both commercial Neuromarketing projects and academic studies carried out in partnership settings.

Article 12: IMPLEMENTATION reinforce the requirement that all the involved parties in a Neuromarketing project abide to the Code and the researcher provide a link to www.nmsba.com/ethics.

2.2. Research Ethics Framework at EU and national levels

Besides the Code of NMSBA, as a professional association, Neuromarketing research, at least in its academic version, comes under the provisions of EU and national bodies regulations as part of general research, research in social studies and humanities or interdisciplinary research.

European Commission's Ethics in Social Sciences and Humanities of 2001, for. While most of the European countries have ethics committees working by the supervisory boards of universities and research institutes, their role does not include the approval of research projects, but rather guidance, and complaints solving, when necessary. For instance, all instance, urges any applicant for EU funded research to provide an ethical approval of the project by an ethics committee, or, when such a committee does not exist, an ethical opinion of a research partner's ethics committee or at least a self-evaluation of the ethical aspects of the project together with a documented explanation of the impossibility to get an ethical authorizationthe universities and most of the research entities in The Netherlands adopted Netherlands Code of Conduct for Research Integrity (2018), consisting in five good research practice principles and 61 detailed standards. While each institution's ethics committee has the authority and obligation to ensure an ethical climate, to provide ethical guidance, to investigated possible cases of misconduct and to issue proposals for corrective decisions, these can be challenged with the Netherlands Board of Research Integrity. Still, all ethics committees' findings are informative, a possible

corrective decision being made by the organization's supervisory board. A similar approach is found in Norway, where the parliament founded in 1990 the National Research Ethics Committee, made up by the National Committee for Research Ethics in the Social Studies and Humanities (NESH), National Committee for Research Ethics in Natural Sciences and Technology (NENT), and National Committee for Research Ethics in Medicine and Health (NEM). NESH issued its fifth version of Guidelines for Research Ethics in the Social Sciences and the Humanities in 2021 (NESH, 2021), consisting of 50 detailed guidelines grouped in five parts. While the provisions of this document is far from optional, there are three aspects worth noticing: a) NESH is explicitly described as an advisory body, not a controller or a court, b) Free and independent research is not only the first of the 50 guidelines, but it is also resumed in guideline 36 – Independence in Research, according to which the obligation to ensure researchers' protection from pressure and control rests to all research participants, and c) there are also two guidelines devoted to research safety: 13 – Safety and security and 28 – Risk of harm and disadvantage.

Making such guidelines publicly available for all research participants, ensuring that competent advice is available upon request, placing research responsibility with the researcher, and investigating potential deviations from research ethics when necessary by specialized and esteemed bodies may provide the optimal background for sound research activity. Prompting researchers to obtain approval from Ethics Committees would distort the research community and will seriously slow down the research activity. This statement is particularly true for research in Consumer Neuroscience and Neuromarketing, given a) domain novelty, hence, lack of skilled and experienced individuals, b) fast development of new instruments, techniques, and research methodology, and c) the huge potential benefits from supplementing traditional research methods with the new ones of documented effectiveness.

3. Research limits and further recommendations

The present paper is by no means a complete presentation of the ethical concerns in the field of Neuromarketing, whether normative, as they appear in various codes and regulations, or as found in academic or business practice. A more extensive comparison of the current practice in Neuromarketing research across several legislations may spot areas to be improved – and more strongly support the proposed actions.

Supplementary, such an endeavor would greatly benefit from a panel of experts. Throughout this paper, for instance, it was argued that PET and brain activity modulating methods should be severely restrained or even excluded from the toolbox Neuromarketing researchers may use; incoherent legal provisions across some countries and provisions, personal interpretation of several normative acts, recent history of Neuromarketing development, and assessments of the methods' effectiveness and potential threats were presented as arguments for a rather trenchant proposal. Nevertheless, the qualified and certified opinions of a team of specialists in the respective fields – such as radiologists, neurologists, physicists, and neuroimaging experts would be much more useful for the domain regulators.

Conclusions

Ethical concerns in the field of Consumer Neuroscience are common to those encountered by most other social sciences, as we find them in the ethical codes of various organizations and national or EU-level regulations. The deviations from the provisions of the Consumer Neuroscience codes of ethics are, in many respects (including the commitment to professional standards, duty of transparency towards clients, participants' informed consent, voluntary participation and data privacy rights, and research data publication), similar to those recorded in other fields. There are two critical areas, though, where the situation in Consumer

Neuroscience and Neuromarketing deviates far more from the normative provisions than those recorded in traditional Marketing or in the medical field: overpromising, as it manifests in both exaggerating the Neuromarketing findings to clients, and researchers' knowledge and expertise, and putting the participants in dangerous situations through the unnecessary choice of research methods and tools that present a level of risk above the minimal one.

Two approaches have emerged to deal with ethical issues: the first, based on Ethics Councils to approve each research project, already in place in several countries, and the second, where the researcher should be prepared to explain the deviations from the appropriate good practice guides. I supported the second, given the research freedom provisions of the European Charter for Researchers, and the novelty of the Consumer Neuroscience domain, leading to a fast increase in the number and types of research projects and scarcity of genuine expertise. On the other side, I argued that two sets of methods (PET and brain activity modulating methods) should be severely restricted if not excluded from the set available to researchers in Consumer Neuroscience, as there are instruments providing the same data with minimal risk to participants.

Finally, as Consumer Neuroscience and Neuromarketing are developing fast, we consider that at least a minimum knowledge of the field for all involved participants (including Marketing researchers, academics, practitioners, and data users) is not a cliché. While looking for the best cost-benefit ratio is part of the ethical guidelines in several national regulations and EU-funded research, a basic understanding of the functioning and expected performance of the various methods and tools involved in research projects would inhibit and spot unethical behavior.

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