Consumers' Attitude Towards Applying Fmri in Marketing Research

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Recently, marketing research has recognized the potential of applying neuroscientific methods. While the major advantages of these techniques, such as an alternative possibility of investigating unconscious phenomena and emotions and a better handling of response bias or measurement effects, are evident from a scientific point of view, this is not necessarily the case regarding the attitude of the average consumer. The present paper is about an empirical acceptance study aiming at gaining information on people’s opinion on these techniques. In particular, functional magnetic resonance imaging (fMRI) was focussed on for this technique is most promising regarding future fundamental consumer behavior research. Issues such as people’s willingness to participate in fMRI-studies, any health or ethical reservations involved, facets of perceived risk and intrinsic versus extrinsic motivation for participation were addressed.

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INTRODUCTION
Observational research techniques have had a long history in marketing research in general and consumer behavior research in particular (Lee and Broderick 2007). Regarding contemporary marketing research, sophisticated technological innovations such as internet-based innovations like Web 2.0 but also technologies adopted from other disciplines such as neuroscience allow for new insight into consumer behavior from another angle and on a higher level of precision and accuracy. Whereas Web 2.0 provides new possibilities regarding some parts of the research process, such as, data collection and recruitment of participants (see, e.g., Kozinets 2002), methods from neuroscience revolutionize the whole research process. The predominantly employed research tools can be roughly grouped into two main categories according to the underlying mechanisms measured, electroencephalography (EEG) and magnetoencephalography (MEG) measuring electrical brain activity versus positron-emission-tomography (PET) and functional magnetic resonance imaging (fMRI) measuring metabolic activity (for a more detailed discussion of these methods see, e.g., Cacioppo et al. 2003; Houser and McCabe 2009; Kenning et al. 2007a; Schilke and Reimann 2007; Willingham and Dunn 2003). Among those four techniques, EEG, MEG and fMRI have proven to serve particularly well regarding experimental procedures in marketing research (see, e.g., Ambler et al. 2004; Kenning et al. 2007a; Lee et al. 2007; Schilke and Reimann 2007; Senior et al. 2007). As PET uses radioactive tracers, the application to a wider population in marketing research is limited. Compared to EEG, MEG has a better spatial resolution but incurs relatively high costs of measurement. The complex data analysis further limits its practical applicability (Kenning et al. 2007a). EEG provides a good temporal resolution, implies relatively moderate equipment costs and a straightforward data analysis. Moreover, it has had a long tradition in marketing research and related disciplines such as psychology (Murphy et al. 2008; Rothschild et al. 1988). For instance, well-established latent constructs like cognitive dissonance, in which both psychology and marketing have always been interested, was investigated in an EEG-study (Harmon-Jones et al. 2008). Recently, there have been several methodological publications on the combined application of fMRI and EEG to obtain both spatial and temporal resolution (Herrmann and Debener 2008; Moosmann et al. 2008), but this technique is not well established yet (Willingham and Dunn 2003), especially in marketing research. In a marketing research context, fMRI is currently the most frequently used brain imaging technique, as it has a very good spatial resolution (Kenning et al. 2007a) and therefore serves best for mapping brain activities providing neural correlates of, e.g., decision-making, brand perception and, most important, unconscious emotional processes accompanying and/or influencing conscious decision-processes (Hubert and Kenning 2008). Explaining individual purchase decision-making has always been of high interest in consumer behavior. Over the past 50 years, various models have been established incorporating underlying cognitive and emotional phenomena (for an overview see, e.g., Hansen 1972; Hansen 2005). Since the technological innovation of fMRI in the early 1990s, a new era of explaining human behavior has started (Bandettini 2007; Senior et al. 2007). “Neuromarketing” (see Wilson et al. 2008 for a detailed description on the emergence of this term) is by no means a step towards mind-reading (Grimes 2006), however, the understanding of brain functions substantially contributes to fundamental knowledge and perfectly complements contemporary consumer behavior research.

As the application of fMRI has been constantly increasing in consumer behavior research, it is essential to have a closer look at the consumers’ evaluation of this development. It is the consumer who serves as a test subject in empirical marketing research studies and it is finally also the consumer who is wanted to buy the products or services created and advertised by industry based on the data gained from market research. Apart from the leading work by Albaum, Evangelista and Medina (1998) and Evangelista, Albaum and Poon (1999) on theoretical explanations of survey response behavior (Albaum et al. 1998; Evangelista et al. 1999), to the best of my knowledge, little is known about how people feel about various methods and research techniques applied for marketing research purposes, neither regarding traditional behavioral methods nor alternative neuroscientific ones. This is a major shortcoming, because more detailed knowledge would provide guidance to researchers in terms of enhancing respondent cooperation and therewith accurate and truthful reporting of data. Scholarly publications are dealing with issues such as how to increase response rates and the usage of incentives (Cobanoglu and Cobanoglu 2003; Deutskens et al. 2004) but empirical studies on psychological constructs and personality traits explaining the willingness to participate as test subjects are scarce. This is unfortunate as an over- or underrepresentation of test subjects regarding certain parameter values can lead to problems regarding the generalizability of results. In the present study it is hypothesized that people scoring higher on psychological constructs such as perceived risk or technology anxiety are less willing to take part in an fMRI-experiment and may therefore be underrepresented. While the interest in “neuromarketing” started in marketing research more than a decade ago, the “neuromarketing”-approach has become quite popular nowadays in the industry as well and attracts public interest. Following Wilson, Gaines and Hill (2008), today there are more than 90 consulting agencies who specialized in “neuromarketing” (Wilson et al. 2008). “Googling” the term “neuromarketing” currently yields more than 800,000 hits” (Hubert and Kenning 2008, p. 274) and even newspapers have started to report about this emerging issue. Esch (2008) notes that besides the groundbreaking findings in research there are also various questionable publications and objectives (Esch 2008). Consequently, all the information on “what neuromarketing can or cannot do” can be quite confusing for the consumer. Concerns and ethical reservations about “neuromarketing” as both method of data collection and marketing and communication approach applied by the industry, are more likely to arise compared to traditional questionnaire-based and self-report methods. Based on these issues, the present paper is about consumers’ attitude towards the application of fMRI in marketing research. An online-questionnaire with a final sample of n=901 was administered, investigating psychological constructs explaining the acceptance of this alternative approach in consumer behavior. Based on these quantitative findings, a mixed-methods-design was followed by subsequently addressing selected important topical areas such as “ethics in neuromarketing” in a first focus group discussion as basis for further research.
THEORETICAL BACKGROUND

Neuroscientific Methods in Marketing Research—Promises and Limitations

Whereas the main advantages of applying neuroimaging techniques within the field of marketing research are quite evident from a scientific point of view—alternative possibility of investigating unconscious phenomena and emotions, better handling of response bias or measurement effects occurring in traditional self-report studies—this is not necessarily the case from the perspective of the consumer who in the end is asked to participate as a test subject. Regarding the future application of neuroscientific methods in marketing research, among neuroimaging techniques, EEG and fMRI applied in combination with traditional quantitative and qualitative methods are thought to have the greatest potential (Page 2008). For pragmatic reasons, EEG is likely to see wider use than fMRI, but its application to everyday marketing field research is also limited. Moreover, another possible big winner is eye-tracking (see, e.g., Lorigo et al. 2008), as the technology has advanced to be essentially robust and also cost-efficient (Page 2008). Regarding future fundamental research in consumer behavior, fMRI-studies are the most promising for which the present study exclusively addresses the application of fMRI in marketing research. Neuroimaging techniques complement traditional methods of investigating human behavior and especially human decision-making. This is analogous to what Harmon-Jones and Devine (2003) cite about the application of neuroscientific methods in social psychology: “[... to understand mechanisms underlying mind and behavior, both biological and social approaches are needed.” (Cacioppo and Berntson 2002, in Harmon-Jones and Devine 2003, p. 590). Neuroimaging techniques can contribute to fundamental research in terms of a better conceptual understanding of latent constructs in consumer behavior. Measuring neural correlates within an fMRI-experiment allows not only for challenging but also adding new facets and providing a better explanation of already well-established models of decision-making, processing of information or the perception of brand and advertisements. For instance, Yoon et al. (2006) added new information regarding the brand personality concept based on fMRI data (Yoon et al. 2006). Regarding the measurement of latent constructs, these techniques explore neural correlates and thereby contribute to content and construct validity of traditional measures. As these concepts have been developed within traditional experimental settings and/or qualitative and quantitative field studies, additional information from neuroscience is appreciated. This knowledge will contribute to overcoming the obstacles traditional quantitative marketing research has always had to deal with and will help to establish sound and valid measures to capture, e.g., cognitions, emotions or attitudes. All in all, the author supports the view that it is the combination of traditional and technology-based new and multidisciplinary methods that will significantly frame the future of consumer behavior research. Besides these advantages of fMRI in marketing research, there are still some major limitations. An fMRI-study is very cost-intensive, regarding both the need for an experienced and skilled multidisciplinary research team and financially (Ambler 2008). Furthermore, there are issues of internal as well as external validity that have to be taken into account. Being in an fMRI-scanner during a laboratory experiment is not really comparable to a real consumption situation. Taking part in an fMRI-experiment can be stressful for the test subjects. The operating expense of the whole experiment is high. Regarding the status quo and the possible future development of fMRI in marketing and consumer behavior research, Ambler (2008) maintains that: “The tools have not advanced to the point where researchers can offer practitioners significant paybacks with any certainty. No doubt this will happen just as X rays moved from Marie Curie’s laboratory to every dentist’s surgery but that took 70 years.” (Ambler 2008, p. 9).

Consumers’ evaluation of research methods in marketing research

To be able to conduct more neuroimaging studies in the near future, people willing to participate in these studies are needed. The quality of results heavily depends, among other factors, on the participants’ compliance with the tasks they have to perform. There are special requirements regarding the person itself as well as the data collection procedure that have to be granted. For instance, the whole experiment is very time consuming (the average scanning procedure for one participant takes between 60 and 90 minutes (Schilke and Reimann 2007). There is a considerable space restriction within the scanner and there is the necessity of non-metallic clothing and removal of any (body) jewellery because of the strong magnetic field. Respondents’ attitudes towards different research methods can significantly influence the whole data collection process, if, e.g., the test person doesn’t want to properly accomplish the tasks required. Roe et al. (2009) found out that recruits with more conservative general risk attitudes and higher measures of harm avoidance are less likely to agree to participate in biomedical experiments involving an fMRI session or a blood sample obtained via phlebotomy. These results indicate a major threat to the generalizability of economic studies applying biomedical techniques to the general population due to a possible sampling bias. In order to enhance the quality of the results as well as to avoid loss of resources, those possible threats should be taken into account when designing fMRI experiments. Even with traditional marketing research techniques, there is still known little about, e.g., motives or personality traits influencing the willingness to participate. Ognibene’s results suggesting that questionnaire response is affected by leadership traits and ambitious reading habits date back to the 1970s (Ognibene 1970). Regarding the quality of marketing research in terms of representative samples, more in-depth and up-to-date knowledge about these issues is important. As new technologies have found their way into marketing research, a better understanding of peoples attitudes towards current methods and techniques is vital. This knowledge can help to establish a meaningful database (e.g., online-panels) for conducting offline- and/or online-surveys. In the case of neuroscientific methods, the issue is even more challenging. The application of neuroimaging methods is often quite new to researchers and even more unfamiliar to test subjects involved in empirical studies. Taking part in an EEG, MEG or fMRI-study is not an everyday experience for the average consumer. Still a small number of publications have dealt with participants’ needs and requirements when taking part in neuroscientific studies. Roe et al. (2009) discussed the issue of a possible selection bias in test subject pools for experiments involving neuroimaging and blood samples (Roe et al. 2009). Cooke et al. (2007) and Senior et al. (2007) addressed the participants’ experiences of taking part in research involving fMRI or MEG procedures by applying a mix of quantitative and qualitative methods. As they interviewed people right after their participation in an fMRI or MEG experiment, the sample size was rather small (n=21 for fMRI and n=23 for MEG) (Cooke et al. 2007; Senior et al. 2007).

EMPIRICAL DEMONSTRATION

Quantitative Study—Conceptual Research Model and Empirical Design

As consumer behavior research is interested in the consumer in order to derive knowledge about real-life purchasing, the author
wanted to gain information on what the average consumer thinks about the usage of fMRI for marketing research purposes, under which conditions people would be willing to participate, whether there is a need for providing (financial) incentives or whether they have any concerns, e.g., health-related or ethical reservations. Getting information on participants’ needs and requirements will help designing future projects and evading any interferences due to non-compliance of the participants during data collection. As fMRI-studies are very cost-intensive (Ambler 2008), the researcher is advised to have comprehensive knowledge not only about the whole experimental procedure but also about the participant’s needs and requirements in order to be able to prevent any disturbances during the experiment. The present study covers both exploratory questions to gain first descriptive insight into how consumers feel about the topic in general and an effort to reveal (causal) relations between explanatory psychological phenomena and the willingness to participate as a test subject in an fMRI-study. In the questionnaire, after the exploratory questions, there was a detailed description of applying fMRI in marketing research in order to guarantee that all participants in the survey had sufficient knowledge about what they would have to expect as test subjects in an fMRI-experiment. Literature-based information on the application of fMRI in marketing research in general and on the possible experimental setting in particular was given. A picture of a person lying in an fMRI-scanner complemented the explanation. The conceptual research model was based on the key findings of Cooke, Peel, Shaw and Senior (2007) and Senior, Smyth, Cooke, Shaw and Peel (2007) as well as on general literature regarding psychological constructs involved in explaining attitude and behavioral intention. Regarding the latter, literature on (technology) acceptance models applied in a marketing context (James et al. 2006; Kulviwat et al. 2007; Meuter et al. 2005; Meuter et al. 2000; Suh and Han 2002; Yoon and Kim 2007; Yu et al. 2005) caught the author’s attention. Some explanatory variables for the willingness (intention) to participate in a highly technology-driven experimental setting lend themselves to being applied. The validated measurement scales for perceived risk, intrinsic and extrinsic motivation, technology anxiety and attitude were adopted to the present research context. The dependent variable, i.e., the expressed willingness to participate, is complemented by another behavioral control variable named “consent to participate”. Whereas the “willingness to participate” doesn’t involve a concrete action, in answering the variable of “consent to participate” respondents had to act on their intention. This control variable allows for a more accurate estimation of how the respondents really feel. While agreeing to the question whether one would be willing to participate (willingness to participate) expresses some commitment, filling in ones contact details in a binding list of participants (consent to participate, for more details on the operationalization of the main constructs see table 1) represents a particularly high degree of commitment. Figure 1 shows the conceptual research model.

The hypothesized relationships incorporated are as follows:

H1-4: Perceived risk, technology anxiety, intrinsic and extrinsic motivation are assumed to explain the willingness to participate in a causal way. Following the findings of Evangelista, Albaum and Poon (1999) on the relevance of exchange theory, intrinsic and extrinsic motivation are assumed to explain the willingness to participate as a test subject. As fMRI is a quite unfamiliar new technology for most of the participants, perceived risk and technology anxiety are assumed to be negatively related to the willingness to participate.

H5: The articulated willingness to participate and the consent to participate are assumed to have a high positive correlation.

H6-7: Attitude and both willingness to participate and consent to participate are assumed to be positively correlated.

H8: Demographic variables (gender, age, income, blood donation behavior and previous medical MRI-experience) are assumed to explain the willingness to participate. Age is expected to be negatively correlated with the willingness to participate as older people tend to be more averse to accept new technologies.

Demographics and Selected Descriptive Results

The final sample consists of 901 respondents with 38.4% males and 61.6% females. The average age is 25.26 with the youngest participant being male and 15 years of age and the oldest
being 61 and also male. In terms of education, 1.6% have basic education, 1.2% attended high school, 77.8% completed college level, and 19.4% obtained a university degree. The relatively young age and high level of education go along with the job categories mentioned; 74.7% are students, 19.9% employees, 3.1% entrepreneurs, 0.6% unemployed and 1.8% have another sort of occupation. Regarding monthly income, 79.9% earn up to $2,325, 12.8% between $2,325 and $4,651 and 7.4% more than $4,651. As it is to a large extent a student sample, the comparability with and the evaluation of previous fMRI-studies, which were often based on student samples as well, is granted. Nevertheless, regarding the literature on the problematic issue of using mainly student subjects in marketing research (Burnett and Dunne 1986), this limitation of the present study has to be taken into account when interpreting the findings. Furthermore, information on health-related behavioral tendencies was collected. For instance, the respondents were asked whether they donate blood or plasma on a regular basis. 11.2% do so in case of blood donation but only 1% regularly donate plasma. 93.3% have already heard about magnetic resonance imaging, and 29.1% indicate that they already collected some more information on the technology. 22.9% have already had a medical examination involving magnetic resonance imaging, 25.2% had already undergone a computed tomography (CT). Those people who indicated that they had already a medical MRI-examination were asked additional questions on how they experienced the whole process in the scanner. Items worded like ‘How did you experience the noise’ were offered with a rating-scale ranging from 1=very pleasant to 5=very unpleasant. The majority of respondents experienced the whole setting rather negatively, especially regarding the disturbing noise (M=3.43, 83.9% of the respondents were scoring between 3 and 5, therefore assumed to have had a rather negative experience), the confined space in the scanner (M=3.07, 69.1% scoring between 3 and 5), the length of the procedure (M=2.99, 68.6% scoring between 3 and 5), the ban on moving (M=2.97, 63.4% scoring between 3 and 5) and the examination in general (M=2.76, 58.6% scoring between 3 and 5). These findings confirm the results found by Cooke, Peel, Shaw and Senior (2007) where 43% indicated the confined space being “a bit upsetting”. On the other hand, regarding the percentages stated above, there were also a number of respondents in the present study who remember the medical MRI-examination as a rather positive experience, respectively. Nevertheless, when being asked in an open-ended question what they remember most, the disturbing noise, the ban on moving and the confined space are mentioned most frequently. Importantly, 46.4% have considerable ethical concerns regarding the application of fMRI for marketing research purposes. This is a very interesting finding that needs to be investigated further. By now, there are still few publications dealing with the ethical issue in neuromarketing (see, e.g., Murphy et al. 2008; Wilson et al. 2008). Therefore, as a second empirical step, a focus group discussion (seven students aged between 22 and 28 years) on “ethics in neuromarketing” was conducted. Preliminary results indicate, that people are ambivalent regarding ethical issues in the “neuromarketing”-context. The focus group participants were very excited about fMRI-studies, very interested in the whole topic and also willing to participate as test subjects in the future. However, the fact that results of fMRI-experiments in marketing research can in the end be the basis for tailored marketing activities by a company raised some discomfort among the participants. More focus groups are already scheduled in order to recheck the initial findings.

Furthermore, the removal of any metallic material is inevitable for a participation due to the strong magnetic field. When participating in an fMRI-study, almost 95% (n=901) would be willing to remove all metallic parts of clothing (scoring between 1 and 2 on a 5-point rating scale, end-points verbalized as 1=fully agree, 5=fully disagree), and 94.1% would remove any piercings jewellery or hair styling gel. These results indicate that the rest is unwilling to participate by not fulfilling the requirements properly. Surprisingly, only 88.9% indicate that they would fully comply with the instructions given by the research team. Only 61.7% would fully trust in the expertise of the research team. 92.8% want to get detailed information about the whole experimental procedure before giving their consent to participate. These results indicate that people are slightly skeptical about the whole procedure. For instance, 10.8% even think that MRI-examinations are a health hazard. At least 25.1% think that fMRI should not be applied in marketing research (item: “I am against the application of fMRI in marketing research”, scoring 1 and 2 on a 5-point rating scale, endpoints verbalized as 1=fully agree, 5=fully disagree).

Constructs and Scale Assessment

Each item measuring the latent independent constructs in the questionnaire was offered with a 5-point rating scale with end points verbalized as 1=“fully agree” and 5=“fully disagree”. Items taken from existing scales were adapted to the present application of attitude towards fMRI in marketing research. Additionally, some new items were generated based on qualitative pre-studies. The present paper can be classified as first empirical large sample sized insight into the topic. Due to this reason, next to the above stated framework of hypothesized causal relationships between attitudinal and behavioral constructs, there was a set of descriptive questions helping to gain first ideas about the overall topic. Therefore, confirmatory factor analysis or structural equation modelling was not applied at this stage of the project. Scale purification was based on exploratory factor analysis and Cronbach’s alpha using SPSS 15.0.

Regarding validity of the central constructs, exploratory factor analyses indicated stable unidimensional results. In the case of perceived risk, 2 items had to be eliminated due to low factor loadings. As shown in table 1, alpha coefficients are on a satisfactory level. The dependent variable “willingness to participate” was measured by two items.

**FINDINGS**

\(H_{1,4}\) assume a causal relationship between perceived risk, technology anxiety, intrinsic motivation, and extrinsic motivation as the independent variables and the willingness to participate as the dependent variable. The results of the multiple regression analysis only partly support this assumption. While technology anxiety had no significant impact on the willingness to participate in an fMRI-study (\(p=.725\)), perceived risk, intrinsic and extrinsic motivation explain almost 73% of the variance of the willingness to participate (\(R^2=.725, p<.001, n=901\)). Standardized beta-coefficients indicate intrinsic motivation (.79) to have by far the strongest influence on the willingness to participate, followed by perceived risk (-.13) and extrinsic motivation (.11). The existence of intrinsic motivation is therefore the most important precondition. More than two-thirds of the respondents are motivated by the prospect of watching their brains work (‘I love the idea of watching my brain work’, scoring 1 or 2). Extrinsic motivators such as monetary incentives or vouchers have a minor impact. People are either willing to participate because they are personally driven or nothing, not even monetary incentives, can persuade them. In case of incentives for participation being offered, 90.1% would prefer to get paid. When being asked in an open-ended question, more than 63% mention amounts between $7 to $80 as an appropriate compensation. Extreme responses range from $0 to $100,000. Some said ‘this amount is not quantifiable’, ‘inestimable’. Asked about participation for about
$45, which reflects the average actual amount paid reported in literature, 59% agreed and 41% disagreed respectively.

H₅ postulates the intention to participate to be positively related to the expressed consent to participate. The non-parametric correlation amounts to Spearman ρ = .64 (n = 901, p < .001) affirming H₅. The relatively low correlation coefficient again underlines the discrepancy that non-binding expression of intention is not necessarily equivalent to actual behavior.

H₆-7 postulate attitude towards fMRI in marketing research to be positively related to the intention to participate. The same relationship should hold for the expressed consent of participation. The correlation amounts to ρ = .79 (n = 901, p < .001) for attitude and intention and to Spearman’s ρ = .54 (n = 901, p < .001) for attitude and consent to participate affirming H₆-7.

H₇ assumes demographics and health related personal tendencies to explain the variance of the willingness to participate. The ANOVA showed no significant influence of gender, income, blood donation behavior and previous medical MRI experience (p = .283). There was only found a significant but very low correlation between age and the willingness to participate (ρ = .14, p < .001).

Younger people are more willing to serve as test subjects. Regarding this finding, recruiting among students is appropriate. New innovations, recruiting in, e.g., online communities is promising. As the younger age group is also more affine to these technological advances such as Web 2.0 offer new possibilities of recruitment. As the variable “consent to participate” reflects actual behavior it is of particular interest. If respondents had chosen the answers a) or b) (see table 1), they were asked to fill in their contact details in a registration form subsequently. 21 out of 22 respondents indicating response a = “binding list of participants” filled in the binding registration form. Only 246 out of 308 respondents indicating b = “non-binding list of participants” effectively stated their contact information. The majority of respondents, 63.4% (n = 571), indicated not being interested in actually participating. These results clearly reflect the discrepancy between indicated intention and actual behavior. This finding has to be considered when interpreting (technology) acceptance studies where intentional behavior is modeled as the dependent variable. Another explanation of the discrepancy could lie in the fact that it was an online questionnaire. A lack of trust in secure data processing via the internet could have kept some people from filling in their contact details.

**DISCUSSION AND FURTHER RESEARCH**

The number of marketing-related studies applying neuroscientific methods has been constantly increasing over the past decade (Ambler et al. 2004; Chamberlain and Broderick 2007; Kenning et al. 2007b; Lee et al. 2007; Plassmann et al. 2007; Schilke and Reimann 2007; Weber et al. 2007). The results of the present study show, that the application of fMRI in marketing is not universally embraced by the respondents. There are, e.g., some ethical reservations. Overall, the attitude towards the application of fMRI in marketing research is ambivalent, albeit slightly positive (M = 2.88, n = 901). In any case, there is potential for enhancement in...
order to boost the willingness to participate as a test subject. Detailed information prior to the experiment is inevitable to enhance trust in the expertise of the research team and the technology. If the actual experience during the experiment does not match prior expectations, proper data collection is at risk for the test subject does not comply with the specific requirements associated with fMRI. Providing more information about the strengths and advantages of the method to a broader population can also enhance trust in and attitude towards its application in marketing research. Intrinsic motivation turned out to have the highest impact on the willingness to participate. This is an interesting finding easing the argumentation in the recruiting process. On the other side, results of fMRI-studies are at risk to be blurred by a sampling bias, if only people scoring high on intrinsic motivation take part in fMRI-experiments as they may also be different from the general population regarding other personality trait variables.

Furthermore, the present study revealed that some negatively toned phenomena are relevant as well. As the whole scanning process can be experienced as rather unsettling, it turned out to be very important to actively enhance the scanning experience. In order to lower any perceived risk involved, detailed information on the whole experimental setting, the scanning procedure, the technology itself, the role of the participant her/himself should be given even prior to the participant’s final consent to participate. It is important that the research team is sensitive to any discomfort experienced by the participant during each single experimental run. These observations should be included in the development of future experimental designs being more “participant friendly”. The comfort of the participant is certainly a major concern when measuring neural correlates as it can easily bias the affective state. Only satisfied and fully cooperative participants provide high quality data without any disturbances due to moving artefacts. Further research is needed regarding participants’ preferences for different marketing research methods in general and regarding different experimental, physiological and neuroscientific procedures in particular. By now, theoretical explanations on why people prefer, e.g., experimental, physiological and neuroscientific procedures in particular. By now, theoretical explanations on why people prefer, e.g., experimental, physiological and neuroscientific procedures in particular. By now, theoretical explanations on why people prefer, e.g., experimental, physiological and neuroscientific procedures in particular. By now, theoretical explanations on why people prefer, e.g., experimental, physiological and neuroscientific procedures in particular.

The neuroimaging research process from the participants’ perspective, “International Journal of Psychology, 63 (2), 152-58.


434 / Consumers’ Attitude Towards Applying fMRI in Marketing Research


