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**Review of the Doctoral Dissertation**

by Mr. Shuvam Chatterjee M.Sc.

entitled: "Cross-cultural differences in shopper attitudes to olfactory marketing:  
Poland vs. India"

prepared under the academic supervision of  
Prof. Paweł Bryła, PhD, DSc (principal advisor)  
at the Faculty of Management,  
University of Lodz

The review was formally initiated based on the resolution of the Scientific Council of the University of Łódź regarding doctoral degrees in management and quality science, dated June 9th, 2025, which appointed me as the reviewer for the doctoral dissertation titled "Cross-cultural differences in shopper attitudes to olfactory marketing: Poland vs. India" authored by Mr. Shuvam Chatterjee, M.Sc.

I obtained this position on June 30th, 2025.

In the review of the dissertation, I considered the subsequent points:

1. Significance of the selection of domain, dissertation theme, and research subject
2. Formal and substantive assessment of the dissertation
3. Formal and methodological remarks and questions
4. Reference to the statutory criteria for evaluating the doctoral dissertation
5. Summary and final conclusions

**I. Relevance of the selection of domain, dissertation theme, and research subject**

In his dissertation, Mr. Shuvam Chatterjee addresses the current and important issue of sensory marketing, focusing on the role of scent in shaping consumer behavior in the retail environment. The topic of the doctoral dissertation is current and aligned with the trend of contemporary interdisciplinary research, and it holds significant importance both scientifically and practically. Sensory marketing, and particularly olfactory marketing, is one of the dynamically developing trends in consumer behavior research. Despite this, there is still little scientific research dedicated to this topic. The results of the analyzes conducted so far indicate that scent in retail environments can influence consumer purchasing behavior, but this is a complex process conditioned by numerous factors, highlighting the need for scientific exploration of this issue. This challenge was undertaken in doctoral work by a PhD candidate who analyzed the influence of scent on customer behavior, taking into account various factors. The issue addressed is current and important from both a scientific perspective and in economic practice, especially in the area of customer experience management.



I confirm that the Doctoral Student has chosen the subject of scientific research appropriately and has correctly justified undertaking it. The high accuracy in selecting the research domain, theme, and subject is one of the key strengths of the assessed dissertation.

## **II. Formal and substantive assessment of the dissertation**

The dissertation consists of two main parts: an extensive introduction and five scientific articles that form the basis of the doctoral work, published in peer-reviewed journals. This solution is in line with the requirements for doctoral dissertations in the form of a publication cycle and demonstrates the doctoral candidate's high level of scientific advancement. In addition to this, the attached documentation included:

- summaries of the work in Polish and English,
- information about the Doctoral Candidate's impressive achievements and scientific activity, highlighting their significant commitment to scientific self-development,
- statements from the co-authors of the publications, confirming that the Doctoral Candidate's own work constituted 90% of each article.

### Opinion on the introduction of work as an integral part of the dissertation

The introduction has a clear structure - it includes a theoretical introduction to the work's topics, research objectives and questions, hypotheses, a description of the methodology, a brief discussion of the most important results, and a summary. Additionally, the appendix includes a bibliography, the survey questionnaires used as measurement instruments in the research process, along with supplementary documentation, and lists of tables and figures. I consider this a valuable addition to the work, allowing for a more complete understanding of the research conducted. The tested survey questionnaires can serve as an excellent research tool in subsequent studies by the Author or other researchers dealing with similar topics.

A strong point of this document is its extensive literature review, covering both classic publications in the fields of marketing and consumer behavior, as well as the latest research on sensory marketing (the publication period spans from 1970 to 2024). The author aptly combines a theoretical perspective with a practical context, referring to literature from both the field of sensory marketing and cultural value theory (Schwartz, Hofstede). It should also be emphasized that this review is synthetic in nature, which confirms the Doctoral Student's ability to critically analyze and integrate sources.

The following chapters present and justify the research gap, introduce the objectives of the study, research questions, and scientific hypotheses. Sometimes the way research objectives and hypotheses are formulated raises concerns. The paper shows a discrepancy in the number and wording of the main objectives, and some of the hypotheses could be formulated more clearly. In the self-assessment, one main objective is formulated, but further on, additional main objectives appear, which introduces some conceptual ambiguity. It would be recommended to clarify the hierarchy of objectives and their connection to the research hypotheses. Some objectives were formulated in a rather imprecise way (e.g., "the aim of the research is to investigate"), which is not correct. The research questions were well-suited to the work's subject matter, but they were closed-ended, which limits the possibility of exploring new phenomena.



In qualitative research, open-ended questions would be more appropriate, allowing for broader interpretations.

Four research hypotheses were formulated in the work:

1. Companionship influences Indian consumers more positively than Polish consumers, considering the time and money spent and impulse buying in a scented retail environment.
2. Companionship influences Indian consumers' cognitive, behavioral, and attitudinal responses more positively than Polish consumers in a scented retail environment.
3. Consumer ratings of environmental scent quality in a retail store are positively associated with the amount of money spent in India and Poland.
4. Fragrance within a retail store helps foster cognitive, behavioral, and attitudinal loyalty in a retail environment.

These hypotheses were formulated clearly and logically linked to the adopted objectives of the work. They highlight important aspects of sensory marketing, particularly the role of scent in retail units, cross-cultural differences in its perception, and the significance of consumer loyalty. However, it should be emphasized that the second and fourth hypotheses are somewhat too elaborate, as they combine different aspects (cognitive, behavioral, and attitudinal) simultaneously, which complicates their unambiguous empirical verification. It would be clearer to generalize them into a single synthetic hypothesis or to extract separate hypotheses for each dimension of loyalty. After reviewing the scientific articles that form the basis of the dissertation, it can be assumed that the hypotheses presented in this way are the main hypotheses for the hypotheses contained in some articles, which can be considered partial hypotheses. I believe that for a complete picture of the research conducted, all the main and partial hypotheses should be included in this part of the introduction, properly organized and formulated in a way that allows for their unambiguous verification.

In the next point of the introduction, the research methodology is presented in a simple but understandable way. In the research process, the Doctoral Candidate applied triangulation of methods, utilizing qualitative methods (interviews) and quantitative methods (survey research). In some parts of the research, he used already known measurement instruments (ZMET, CFA), while in others, he applied his own tools (questionnaires), which were appropriately prepared for the purposes of the conducted research. The statistical analysis conducted by the Doctoral Student is noteworthy, as it demonstrates knowledge of statistical measures, the ability to apply them, and the interpretation of research results.

In the next part of the discussed document, the Author summarized the scientific articles that formed the basis of the dissertation, highlighting their objectives and main content. This served as significant preparation for familiarizing oneself with the full versions of the publications.

The final point of the introduction was the Summary, which included the verification of the hypotheses and conclusions. Two hypotheses were positively verified, and two were verified ambiguously, which I consider inappropriate and was caused by the ambiguous wording of those hypotheses. The conclusions presented were more of a summary of the results than a new idea stemming from the research. When developing their research skills, doctoral students should pay more attention to this element of their work. In the next part of the summary, the author presented the theoretical and practical implications of the conducted



research, highlighting their significance for science and entrepreneurs (traders, designers, and marketers). He then presented the limitations of the research (geographical limitations, the specificity of the study sites, the lack of a detailed description of the scents, an unbalanced sample structure, and only selected variables). The chapter concludes by indicating directions for further research, some of which are related to the limitations identified, while others are reflections after the conducted studies. Among them, the author pointed out a change in the research approach (controlled experiments), a change in the structure of the consumers studied to include diverse ages and personality traits of the respondents and their preferences, conducting research in other cities and countries and in various types of stores, as well as analyzing the influence of sensory stimuli other than just olfactory ones. This awareness on the part of the Doctoral Student indicates his scientific maturity and ability to critically assess scientific research, including his own, as well as ability to identify potential avenues for further scientific development.

### Article cycle assessment

The second part of the dissertation includes a collection of five thematically coherent scientific articles published in reputable journals, including those indexed in Scopus and Web of Science databases, with a total impact factor of  $IF=3.7$  (300 points according to the Ministry of Education and Science), which demonstrates the high scientific level of the Doctoral Candidate's achievements.

The first article ("Innovation and trends in olfactory marketing: A review of the literature") is a review and systematization. Based on scientific publications, the author systematically presented the current research on scent marketing, identifying the most important trends and research gaps. It lacks a stronger grounding in theories of culture and consumer behavior. The doctoral candidate's precision in selecting the relevant literature and the research methods used for this purpose (PRISMA and ZMET) are noteworthy. This publication forms the theoretical basis for the entire dissertation and justifies the undertaking of empirical research.

Another publication ("Mapping semi-conscious consumer decisions using ZMET in the retail market context") focuses on the application of the Zaltman Metaphor Elicitation Technique (ZMET) in consumer research. The author aptly utilized this tool to identify hidden purchasing motivations and factors influencing buyer behavior, which allowed for a deeper understanding of consumer decision-making processes and the construction of a theoretical framework for scent marketing. I believe that more respondent statements could be presented in the Appendix of the dissertation. The article is characterized by high methodological value and makes a significant contribution to the development of marketing research methods.

In the third article ("Cross-cultural differences in the effects of ambient scent on in-store behavior: the role of companionship"), the doctoral student is analyzing cultural differences in the perception of olfactory stimuli. Comparative studies conducted in Poland and India have shown that cultural factors significantly determine consumer behavior. This is a valuable interdisciplinary approach, combining sensory marketing with cultural values. At work, it would be worth clarifying the scope of the scents being analyzed and the relational dependencies between the subjects and their companions.

The next article ("Olfactory marketing as a technological innovation tool for the Indian retail industry") presents the issue of the practical application of olfactory marketing in the

Indian retail industry. A strong point of the publication is its highlighting of scent as a tool for technological innovation and a competitive differentiator in the retail industry. At the same time, the article highlights the implementation challenges related to consumer perception.

The latest publication ("Effects of in-store fragrance as a cognitive innovation on loyalty building behavior") makes a significant contribution to research on consumer loyalty. The author demonstrated that scent can function as a cognitive innovation, strengthening the consumer's bond with the brand. The strength of the work lies in the interdisciplinary connection between consumer psychology and innovation marketing. The statistical analysis of the results is noteworthy, particularly the use of regression models to analyze the influence of various factors on consumer purchase intentions. They play an important role, but they are not predictive mathematical models in the strict sense. Although the age of the respondents, analyzed as an influencing factor, proved to be significant, there was a lack of in-depth interpretation of this result and its implications for market segmentation. Despite this, I believe this article provides valuable insights for organizations and marketing.

The substantive value of the Doctoral Candidate's research does not require further detailed evaluation and discussion because it was analyzed and positively evaluated by independent reviewers and published in peer-reviewed scientific journals. However, as a reviewer of the doctoral dissertation presented to me, I would like to emphasize that these publications form a compatible set of data, presented in a good order, creating a logical and complementary research sequence. These publications address the issues of innovative applications of sensory marketing in retail, with a particular focus on the role of scent in shaping consumer behavior in the Polish and Indian markets. The advantage of the cycle is its consistent connection of theoretical frameworks with the results of empirical research in various cultural contexts. All publications contained extensive theoretical introductions based on the latest scientific publications. Each of the articles has a clearly defined research objective and contributes new knowledge to the subject literature. Their common thread is the analysis of the significance of olfactory stimuli in consumer decision-making processes and building loyalty to retail brands. The presented studies were appropriately planned and conducted. Suitable research and statistical methods were used in them.

The research results were properly processed and presented in well-prepared tables and graphs. The results were discussed and analyzed, the research hypotheses were verified, and conclusions were drawn. In the studies, the author pointed out the problems and limitations that could have affected the quality of the results. This demonstrates the Doctoral Candidate's scientific maturity. All articles were based on current publications, the vast majority of which were the latest ones, appropriately selected for the article topics.

It is worth noting that in all articles, the Doctoral Student's own contribution was clearly indicated and encompasses the dominant part of the conceptual, empirical, and editorial research, which confirms their scientific independence.

I consider the following to be particularly valuable in the dissertation submitted for review:

- The interdisciplinary presentation of the theoretical foundations and their development (Theory of Planned Behavior (TPB), Schwartz's theory of cultural values, and the SOR model).



- A cross-cultural comparison between Poland and India, which brings original value because it examines the differences between individualistic and collectivist cultures, a topic that rarely appears in the literature.
- Demonstrating that Schwartz's theory doesn't explain everything, as exemplified by hypothesis 2, which was ambiguously verified.
- Analysis of consumer loyalty factors and the development of mathematical models describing the importance of these factors.
- Practical implications for scent marketing, supporting the management of the quality of commercial services.

### **III. Formal and methodological remarks and questions**

In addition to highlighting the merits and strengths of the dissertation, the reviewer also has the obligation to point out certain remarks and errors and to ask questions, which is difficult in the case of the presented work, as the Author himself indicated the limitations, shortcomings, and proposed alternative solutions. However, the published literature raised a few comments and questions, which I have included below.

#### Comments on the work:

1. Discrepancies in the formulation of goals and hypotheses in the introduction and publications, and incorrect formulation and verification of hypotheses in the introduction.
2. Lack of clear indication of the scents used in retail stores - empirical studies did not provide detailed information about the type and nature of the scents (e.g., citrus, floral), their intensity, or the method of diffusion, which is a significant limitation for replicating the research and its applicability.
3. Operationalization of Loyalty Concepts - The author distinguishes between cognitive, emotional, and behavioral loyalty, but does not always clearly explain the boundaries between these categories. This can lead to overlapping dimensions and interpretive doubts.
4. The measurement instruments were not fully described - the questionnaires consisted of various types of questions, but the author only indicated selected ones (Likert scale).
5. Narrowing the research group to younger consumers (20-40 years old) - which the author mentions themselves, but in the review, it's worth highlighting that this excludes the possibility of drawing conclusions about older consumers, who may react differently to sensory stimuli.

#### Reading the presented dissertation raised the following questions:

1. Were the relationships between the companions and the subjects studied, e.g., parent - child, wife - husband, girlfriend - boyfriend, etc.? This could have influenced the factors being analyzed, such as the time spent in the store.
2. Have studies been conducted on the impact of companionship in stores that do not use scent marketing?
3. Which industries (clothing, food, cosmetics) will benefit most from the obtained results?

4. How can this topic be developed by connecting it with neuromarketing, VR/AR, or artificial intelligence?
5. What are the ethical boundaries of using olfactory stimuli in commerce (manipulation, allergies)?

#### **IV. Reference to the statutory criteria for evaluating the doctoral dissertation**

##### Doctoral Candidate's theoretical knowledge

The dissertation presents the Doctoral Candidate's broad and in-depth theoretical knowledge in the fields of sensory marketing, consumer behavior, and cultural theories (including Hofstede, Schwartz). It is current, well-documented, and additionally enriched with its own conceptual framework. Furthermore, a doctoral student not only reproduces knowledge but is also able to critically process it and identify research gaps. The author demonstrated the ability to critically analyze both classical and recent literature and to properly place their own research within the context of existing scientific achievements. I rate this aspect very highly, definitely positively.

##### The ability to conduct independent scientific research

The dissertation clearly demonstrates the doctoral candidate's ability to conduct independent scientific research. Both the choice of methods and the ability to combine and apply them, as well as the critical analysis of the results, demonstrate a high level of research maturity. It is evident that the doctoral student is not limited to replicating research, but is developing their own conceptual models and testing them empirically. Evidence of this independence is the high quality of publications published in peer-reviewed international journals and statements from the authors of the publications indicating the Doctoral Student's significant contribution to their creation. All of this allows for a very good rating for this aspect of the review.

##### Originality of solutions in the economic and social spheres

The dissertation presents an original solution in the economic and social sphere, as it shows how scent marketing can be treated not only as a tactical sales tool, but also as an innovative tool for managing customer experience and building loyalty. Additionally, by incorporating an intercultural perspective, the findings have practical significance not only for companies but also for broader social contexts related to the perception of the environment. The results can be applied in retail operations and in designing consumer experiences. I definitely rate this aspect of the assessment very highly.

#### **V. Summary and final conclusions**

The doctoral dissertation submitted for review by Mr. Shuvam Chatterjee, M.Sc., is an original and valuable scientific study that meets the requirements for doctoral dissertations. The dissertation constitutes a coherent and valuable cycle of scientific articles concerning the role of scent in retail marketing. The author demonstrated the ability to independently conduct scientific research, critically analyze it, and present the results in reputable international journals. The work makes an original contribution to the development of knowledge in the field



of sensory marketing, highlights the importance of cultural factors in the perception of olfactory stimuli, and indicates practical implications for retail business, demonstrating the Doctoral Candidate's high level of scientific maturity. The comments made in the review do not undermine the overall high substantive value of the dissertation.

The entire work demonstrates the Doctoral Candidate's high competence, research independence, and ability to conduct scientific projects at an international level. The work meets the requirements for doctoral dissertations, and its author deserves to be awarded a doctoral degree.

After reviewing the doctoral dissertation submitted for evaluation by Mr. Shuvam Chatterjee, M.Sc., I state that this work meets the requirements specified in Article 190 of the Act of July 20th, 2018, "Law on Higher Education and Science" (consolidated text: Journal of Laws of 2024, item 1571, as amended). In light of the above, I request the admission of Mr. Shuvam Chatterjee, M.Sc., to the subsequent phases of the doctoral procedure and the public examination of his dissertation.

Simultaneously, due to the high quality of the work and its applied significance, I suggest that the dissertation be recognized with distinction.

A. Rybowski