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INTEGRATION OF ARTIFICIAL INTELLIGENCE IN SENSORY MARKETING AND ITS INFLUENCE ON THE EMOTIONS OF GENERATION Z CONSUMERS IN COFFEE CAFES

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ABSTRACT

This study aims to measure the influence of artificial intelligence (AI)-based sensory marketing on PAD emotions (Pleasure, Arousal, Dominance) and consumer behavioral intention in the context of cafes. The study used an experimental method by dividing respondents into two groups: one group received AI-based sensory marketing interventions, while the other group experienced conventional sensory marketing without AI. Data was collected using a questionnaire that measured PAD emotions and behavioral intentions after interaction with the café environment. Statistical analyses were conducted using the Independent Sample t-test, ANOVA, Cohen's d, and Moderation Analysis to evaluate significant differences between the two groups and to understand the moderation effect of brand experience on outcomes. The results showed that AI intervention did not have a significant effect on consumer emotions or behavioral intention, with a p-value of >0.05 for all variables measured. The effect measure (Cohen's d) also indicated that the differences between the groups were very small and practically insignificant. Additionally, brand experience was not found to be a moderator that reinforces the relationship between AI interventions and emotional or behavioral variables.

KEYWORDS *artificial intelligence, sensory marketing, PAD emotions, behavioral intent, brand experience*

INTRODUCTION

Sensory marketing is a marketing strategy that integrates the five senses: sight, sound, smell, touch, and taste to deeply influence the consumer experience. By utilizing these sensory stimuli, marketers create an emotional bond between consumers and brands, which can encourage consumers to make purchases as well as increase brand loyalty (Krishna et al., 2014). The implementation of this strategy has grown rapidly with technological advancements, especially with the advent of artificial intelligence (AI) in sensory marketing, which helps to create more

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personalized and contextual sensory experiences (Gajda, 2023; Soliman et al., 2023).

Sensory marketing integrated with AI technology allows brands to gain deeper insights into consumers' sensory preferences and emotional responses (Chaffey et al., 2019). With AI, marketers can personalize the customer experience in real-time, improving consumer engagement through deeper interactions (Davenport & Ronanki, 2018). Technologies such as facial recognition and big data processing have allowed brands to analyze consumers' facial expressions and identify emotions resulting from sensory stimuli, which are then used to modify marketing approaches (Fernando & Mulyono, 2023).

However, while the adoption of AI in sensory marketing offers great potential, there are significant challenges that need to be addressed. One of the main challenges is understanding the cultural contexts and preferences of different individuals in responding to sensory stimuli. Cultural variations and demographic differences can affect how consumers react to the sensory elements presented by AI (Kim et al., 2014; Rana et al., 2022). In addition, more in-depth research is needed to understand the long-term impact of AI integration in sensory marketing on consumer behavior.

The importance of this research is in the context of the rapid development of sensory marketing integrated with artificial intelligence (AI), especially in influencing the behavior of Generation Z consumers (Ransbotham et al., 2017). Therefore, understanding how AI can enhance sensory experiences and influence consumer behavioral intent is essential for marketers looking to capitalize on the potential of this market (Das & Varshneya, 2017).

In the context of increasingly fierce competition in the retail and service industry, sensory marketing plays an important role in creating brand differentiation (Wirtz, 2012). The study will provide a deeper understanding of how brands can use AI to create more personalized, immersive and emotional consumer experiences. Previous research has shown that experiences involving the five senses are able to create a longer impression on consumers, which in turn influences loyalty and intention to recommend the brand (Brakus et al., 2009).

This study is also relevant because it explores the variables of PAD emotions (pleasure, arousal, dominance) as important mediators in connecting sensory experiences with consumer behavior. Some studies has previously shown that PAD emotions play an important role in influencing purchasing decisions (Hultén, 2011). However, research specifically exploring the role of AI in managing sensory stimuli to influence emotional PAD is still limited, so this research has the potential to fill this gap.

The novelty of this study lies in several important aspects that distinguish it from previous studies, namely the integration of AI in sensory marketing. Although many studies have addressed sensory marketing, few have explored the impact of integrating AI in designing and managing sensory experiences. This research offers a new perspective by looking at how AI can modify sensory stimuli based on real-time emotional responses from consumers, resulting in more personalized and effective experiences (DWI, 2019). This opens up new spaces for marketers to better understand the dynamics between AI, sensory experiences, and consumer behavior.

Furthermore, brand experience as a moderator, which in this study is also unique because it adds brand experience as a moderation variable between PAD

emotions and behavioral intentions. While many studies have shown a direct link between PAD emotions and behavioral intentions, this study has contributed further by showing how brand experience can reinforce or moderate that relationship (Brakus et al., 2009). This is important because a good brand experience can increase pleasure and arousal levels, which ultimately affects consumers' intention to buy or recommend products.

This research also focuses on generation Z as the subject of the study also provides added value in this research. Generation Z is known to be more connected to technology and has high expectations for personalization in the shopping experience (Šliburytė & Le, 2017). As such, this research will provide relevant insights for marketers targeting this market segment, especially in understanding their preferences regarding sensory marketing and AI. This study uses an experimental approach that allows researchers to test how sensory stimuli generated by AI affect PAD emotions and consumer behavioral intentions in a more measurable way. With the experimental design, this study not only provides correlational results but also makes it possible to identify clear cause-and-effect relationships between the variables involved (Fernando & Mulyono, 2023).

The Influence of Sensory Marketing on PAD Emotions

Sensory marketing utilizes sensory stimuli to influence PAD emotions, namely pleasure, arousal, and dominance. For example, visual elements such as color and design can create feelings of pleasure, while certain scents can trigger higher feelings of pleasure or arousal (Kim, J. H., & Hyun, 2016). Research by (Krishna et al., 2014) shows that attractive visual aesthetics can affect consumer pleasure levels, while the use of music in-store can increase arousal. On the other hand, touch elements, such as the texture of a product, can influence consumers' feelings of dominance, especially when they feel they have more control over the sensory experience (Brakus et al., 2009; Khan & Fatma, 2017).

The Influence of Brand Experience on PAD Emotions

Brand experience is a key element in creating a deep emotional response to consumers. A strong brand experience not only influences pleasure and arousal, but also increases the level of consumer dominance in interacting with the product or service (Brakus et al., 2009). This study reinforces the understanding that a good brand experience can increase the pleasure and arousal dimensions, which ultimately strengthens consumers' emotional connection with the brand (Mostafa & Kasamani, 2021). For example, consumers who have a positive experience with a brand will feel more pleasure and arousal when they are exposed to sensory stimuli from that brand.

The Effect of PAD Emotions on Behavioral Intentions

Previous research shows that PAD emotions have a strong influence on consumer behavioral intentions. The pleasure and arousal that results from a positive sensory experience can encourage consumers to take action, such as making a purchase or recommending a brand to others (Hsieh et al., 2021). Consumers who feel dominant in their interactions with sensory stimuli tend to have stronger behavioral intentions, especially when it comes to brand loyalty (Fernando & Mulyono, 2023). This study will confirm whether the integration of AI in sensory

marketing can strengthen the relationship between PAD emotions and behavioral intentions, especially in the context of Generation Z.

Based on the explanation of the relationship between the variables above, the following frame of mind can be described.

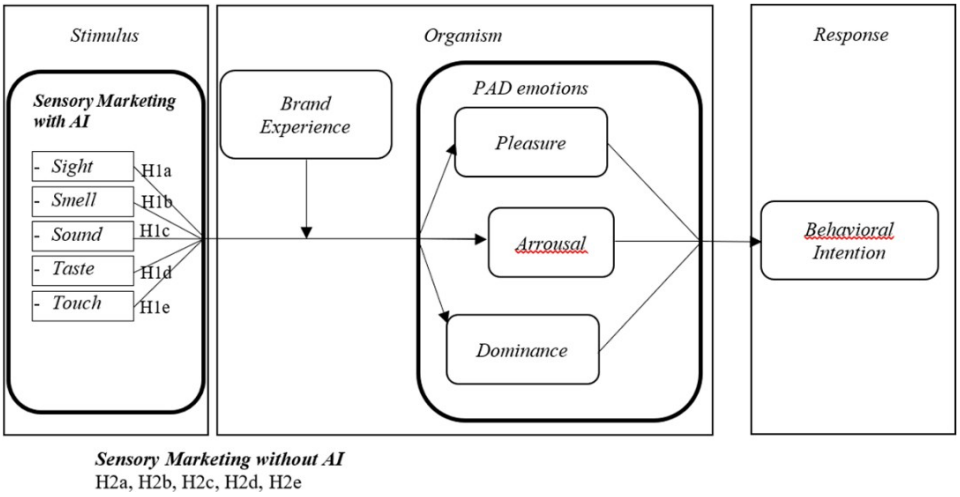

Figure 1. Framework of Thought

Based on the explanation of the relationship between the variables above, the following are the hypotheses set out in this study.

a. Hipotesis 1 (H1a, H1b, H1c, H1d, H1e)
   If sensory marketing that includes sight (H1a), smell (H1b), sound (H1c), taste (H1d), and touch (H1e) is integrated with artificial intelligence (AI), using brand experience, it will affect PAD Emotions, and will affect Behavioral Intention.
b. Hipotesis 2 (H2a, H2b, H2c, H2d, H2e)
   If sensory marketing that includes sight (H2a), smell (H2b), sound (H2c), taste (H2d), and touch (H2e) is not integrated with artificial intelligence (AI), by not using brand experience, it will not affect PAD Emotions, and will not affect Behavioral Intention.

RESEARCH METHOD

The study involved 102 respondents, who were evenly divided into two groups: 51 respondents who received an artificial intelligence (AI)-based sensory marketing intervention and 51 respondents who did not receive the intervention (neutral group). These two groups were tested in two separate studies to explore the influence of sensory interventions on PAD emotions (pleasure, arousal, dominance) and consumer behavioral intention (Krishna et al., 2014; Suharsimi, 2006).

In Study 1, 51 respondents without AI intervention experienced traditional sensory marketing, namely sensory stimuli in the form of sight, smell, sound, taste, and touch in the café environment (Doucé & Janssens, 2013; Roschk & Hosseinpour, 2020). The aim of Study 1 was to measure how conventional sensory marketing affects their emotional response and purchase intent. After undergoing the sensory experience, respondents filled out a questionnaire that measured PAD emotions and intention to make a repeat purchase (Hultén, 2011, 2020). The data was analyzed

using a t-test to find out if there was a significant difference compared to the control group (Putri & Patria, 2018).

Meanwhile, in Study 2, 51 respondents who received AI interventions experienced personalized sensory marketing using AI technology. Their sensory experience is enhanced by the customization of sensory elements such as visuals, aromas, and sounds based on their personal data (Fernando & Mulyono, 2023). As in Study 1, respondents filled out a questionnaire after undergoing this experience to measure their PAD emotions and behavioral intentions, and statistical analysis was also conducted using a t-test. The results of these two studies will provide a deeper understanding of the effectiveness of traditional sensory marketing and the impact of AI integration on emotional responses and consumer behavioral intentions (Brakus et al., 2009; Krishna et al., 2014).

Study 1

The Effect of Sensory Marketing without AI Integration on PAD Emotions and Behavioral Intention

1. Tujuan Study 1

This study aims to explore the influence of sensory marketing on emotional responses (PAD emotions) and consumer behavioral intention without the integration of artificial intelligence (AI). The main goal is to test whether sensory marketing that uses only traditional stimuli (sight, smell, sound, taste, and touch) affects consumers' emotions as well as their intention to make a purchase.

2. Experimental Design Study 1

In this study, 103 respondents were randomly divided into two groups:

a) Control Group: They did not receive special treatment, they only experienced conventional sensory marketing in coffee cafes.
b) Experimental Group 1 (Neutral): Experiencing sensory marketing through ordinary experience without any integrated artificial intelligence elements. They only experience the sensory experience of a traditional coffee café.

3. Study Data Collection Method 1

Respondents in both groups were evaluated after undergoing traditional sensory marketing experiences. Data was collected using a questionnaire that measured PAD responses to emotions (pleasure, arousal, dominance) and behavioral intention. The questionnaire measures consumers' emotional responses to the various sensory stimuli they experience in the coffee café environment, as well as their intention to return or purchase products from the café.

4. Analisis Data Study 1

The data were analyzed using a mean difference test (t-test) between the control group and the neutral experimental group to find out if there was a significant difference in PAD emotions and behavioral intention. The results of Study 1 provide a basis for whether conventional sensory marketing is effective in influencing consumer emotions and behavior without the use of AI.

Study 2

The Influence of Sensory Marketing with AI Integration on PAD Emotions and Behavioral Intention

1. Tujuan Study 2

This study aims to test how the integration of artificial intelligence (AI) in sensory marketing affects consumers' PAD emotions and behavioral intentions. The goal was to see if the use of AI could amplify or alter the impact of traditional sensory marketing on emotional responses and consumer intent.

2. Experimental Design Study 2

In Study 2, 103 respondents were subdivided into two groups:

a) Control Group: Similar to Study 1, this group enjoyed sensory marketing without any AI elements.
b) Experimental Group 2: This group received treatment in the form of sensory marketing integrated with AI. Sensory stimulus involves using AI technology to create more personalized and immersive experiences, such as visual, scent, and sound adjustments based on personalized data.

3. Study Data Collection Method 2

As in Study 1, respondents from both groups filled out a questionnaire after completing their sessions. The questionnaire used measured responses to AI-based sensory stimuli, specifically how AI affects pleasure, arousal, and dominance in PAD emotions, as well as behavioral intentions.

4. Analisis Data Study 2

The data was analyzed using a mean difference test (t-test) between the control group and the experimental group 2 to determine the impact of AI on sensory marketing. In addition, a moderation analysis was conducted to see if brand experience strengthens the relationship between AI-based sensory marketing and emotional responses and consumer behavioral intentions.

RESULT AND DISCUSSION

The statistical analysis in this study aimed to compare the perceptions of two groups of respondents: one group experienced an artificial intelligence (AI)-based sensory marketing intervention (referred to as the intervention group) and the other group received a neutral experience without AI intervention (referred to as the neutral group (Fernando & Mulyono, 2023). The variables measured included perception of café interior elements, decoration, and brand experience (Brakus et al., 2009; Krishna et al., 2014). The two main statistical methods used in this analysis are the Independent Sample t-test and ANOVA (Analysis of Variance) to see if there is a significant difference between the two groups (Lin, 2016; Yi, Y., & Jai, 2017).

Statistical Analysis: Comparing Two Groups

In this study, two groups of respondents were compared, namely the intervention group (who received artificial intelligence/AI-based sensory experiences) and the neutral group (who did not receive the intervention). The variables measured included respondents' perception of the interior elements of the café and the brand experience. Statistical analysis was carried out using two main methods: Independent Sample t-test and ANOVA (Analysis of Variance).

1. Independent Sample t-test

This test was used to compare the averages of two groups that were not interdependent. In this context, the t-test was used to compare how the intervention and neutral groups assessed the sensory elements of the café, such as interior styling, decoration, and brand experience. The main purpose of this test was to determine if there was a significant difference in perception between the two groups.

2. ANOVA (Analysis of Variance)

ANOVAs are useful when more than two independent variables or groups are tested to see if there is a significant difference between them. In this case, ANOVA was used to look at the differences between several variables related to café interior perception and brand experience, by comparing the responses between the intervention group and the neutral group.

3. Effect Size (Cohen's d)

The effect size is calculated to see how much the difference between the two groups is. It provides additional information, regardless of statistical significance. For example, even if the difference is not statistically significant, if the effect size is large, it could indicate that there is a relevant practical impact.

T-test Results

Here are the results of the t-test conducted for each variable related to the interior of the café and the brand experience:

Table 1. T-test Results

Variable	T-Statistics	p-value
Si1-The interior of the café looks pleasing to the eye	1.27	0.21
Si2-The interior arrangement of the café looks balanced	0.59	0.56
Si3-The interior decoration of the café is very attractive	0.12	0.91
Be1-This coffee café tries to engage my senses	0.81	0.42
Be2-Coffee café is perceptually interesting	0.24	0.81
Be3-Coffee cafes make me think about my lifestyle	-0.43	0.67
Be4-Coffee café reminds me of activities I can do	-0.21	0.84
Be5-Coffee café stimulates my curiosity	-0.31	0.76

From the table above, it can be seen that there was no significant difference between the intervention group and the neutral group in terms of perception of the café interior or brand experience. All p-values were greater than 0.05, which suggests that there is no statistical evidence that different experiences (with or without AI-based sensory interventions) significantly affect respondents' perceptions.

a. Variable "Cafe interior looks good on the eye" (Si1): With a t- statistic of 1.27 and a p-value of 0.21, these results show that the respondents' perception of café interiors is not significantly different between the intervention group and the neutral group. Variable "Interior decoration is very attractive" (Si3): The results show a t-statistic of
   0.12 and a p-value of 0.91, which means that both groups rate café décor in the same way.

b. The variable "Coffee café tries to engage my senses" (Be1): t-statistic of 0.81 and p-value of 0.42 also showed that there was no significant difference in the way respondents from both groups experienced sensory engagement in the café.

Table 2. ANOVA Test Results

Variable	F-statistics	p-value
Si1-The interior of the café looks pleasing to the eye	1.60	0.21
Si2-The interior arrangement of the café looks balanced	0.34	0.56
Si3-The interior decoration of the café is very attractive	0.01	0.91
Be1-This coffee café tries to engage my senses	0.66	0.42
Be2-Coffee café is perceptually interesting	0.06	0.81
Be3-Coffee cafes make me think about my lifestyle	0.19	0.67
Be4-Coffee café reminds me of activities I can do	0.04	0.84
Be5-Coffee café stimulates my curiosity	0.09	0.76

The results of the ANOVA test also showed that there was no significant difference in respondents' perceptions between the intervention group and the neutral group for all the variables tested. All p-values are greater than 0.05, which means there is no significant impact of the application of AI-based sensory interventions on the perception of the café's interior or brand experience.

a. The variable "The café interior looks good on the eye" (Si1) had an F- statistic of 1.60 and a p-value of 0.21, indicating that there was no significant difference in perception between the intervention and neutral groups.
b. The variable "Coffee café stimulates my curiosity" (Be5) has an F-statistic of 0.09 and a p-value of 0.76, which means that sensory experience does not affect respondents' curiosity about cafes.

Based on the results of the t-test and ANOVA tests, no significant differences were found between the intervention group and the neutral group in terms of perception of the café interior or brand experience. These results show that the application of artificial intelligence (AI)-based sensory technology in the sensory experience of cafes does not have a significant impact on consumer perception. In other words, while AI technology can create a more personalized sensory experience, its impact in this context is very limited.

CONCLUSION

This study shows that artificial intelligence (AI)-based sensory marketing interventions do not have a significant impact on the perception of emotions and behavioral intentions of consumers in cafes. The results of statistical tests, including t-test, ANOVA, Cohen's d, and Moderation Analysis, showed that there was no significant difference between the group that received the AI intervention and the neutral group in terms of PAD emotions (Pleasure, Arousal, Dominance) and Behavioral Intention. A p-value greater than 0.05 on all variables indicates that the impact of AI interventions on the consumer's sensory experience is very limited. In addition, the calculation of the Effect Size showed that the difference between the two groups was practically insignificant. These results suggest that while AI is considered a potential innovation in marketing, its impact on the sensory experience

in the context of a café may not be optimal yet or too subtle to produce tangible changes.

However, the study has some limitations that should be noted, such as the relatively small sample size and the subtlety of AI interventions that may be too mild for consumers to detect. Future research is suggested to use larger samples and explore more robust and visible AI interventions in the consumer experience, such as more pronounced adjustments to sensory elements such as lighting or scent. Additionally, adding contextual variables such as consumer expectations and preferences, as well as testing AI in a variety of different marketing contexts, such as high-end restaurants or retail stores, can provide deeper insights into the potential of AI in creating more personalized and impactful experiences for consumers.

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