Neurotechnologies in Territorial Marketing: A Systematic Review on Regional Heritage Valorization

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ABSTRACT- In a world characterized by mounting competitive pressures and a proliferation of emotional content, the ability to comprehend the perception and valuation of territories has emerged as a matter of strategic significance. The objective of this study is to examine the role of emotional and neurocognitive mechanisms in the development of more effective territorial marketing strategies. A systematic literature review (SLR) of 48 scientific articles was conducted to identify key variables such as territorial heritage, identity, emotional experience, and neurocognitive processing. Furthermore, the role of neuroscientific tools such as electroencephalography (EEG), eye-tracking, and galvanic skin response (GSR) in capturing unconscious reactions to territorial stimuli is highlighted. The findings indicate that symbolic and emotional experiences enhance the perception, memory, and valuation of territories. A theoretical model is proposed to guide future empirical research and the strategic design of territorial marketing initiatives, based on the evidence analyzed.

Keywords: Territorial heritage, territorial identity, consumer behavior, neuromarketing, territorial marketing

I. INTRODUCTION

This study explores the potential of integrating the principles of neuroscience to enhance the processes of identification and symbolic valuation of territorial resources. These resources, understood as cultural and natural elements, play a crucial role in shaping the identity and uniqueness of places.

A multitude of studies have underscored the significance of recognizing not only the material attributes, but also the symbolic and emotional values that people associate with territories. According to[1], the integration of local knowledge and collective perceptions is fundamental to legitimize territorial management processes. As noted in [2], it is necessary to integrate emotional and experiential criteria in territorial planning to establish a more profound connection with communities.

Conventional approaches to resource identification have historically prioritized technical or expert dimensions, overlooking the manner in which individuals genuinely experience, perceive, and value their environment. Confronted with this limitation, the contributions of neuroscience and neuromarketing facilitate the exploration of the unconscious reactions that territories and their heritage elements evoke in individuals[3], [4]. Techniques such as eye-tracking, electroencephalography (EEG), and galvanic skin response (GSR) have been demonstrated to facilitate the collection of objective data concerning attention, emotion, and memory in relation to heritage elements[3], [4].

The application of neuroscientific instruments in the context of territorial marketing unveils novel avenues for the formulation of strategies that are predicated on emotional activation, attachment to place, and the symbolic construction of territorial identity [2], [5]. By identifying the heritage elements that generate the greatest emotional impact and recall, it is possible to construct more authentic and competitive territorial narratives.

In light of the mounting imperative to comprehend how territories can more profoundly resonate with consumers, it is necessary to incorporate novel perspectives that encompass the emotional dimension and advancements in the field of neuroscience. In this context, the present study aims to conduct a systematic review of the literature that integrates the processes of identification and valuation of territorial resources with the contributions of neuroscience. The objective of this endeavor is to propose a theoretical model that guides more effective territorial marketing strategies from an emotional and cognitive perspective.

The primary findings underscore the significance of neurocognitive variables, including emotional memory, attention, and symbolic perception, in the experience, valuation, and recollection of territories. The article is structured in six sections: introduction, literature review, methodology, results, discussion, and conclusions.

II. LITERATURE REVIEW

A. Heritage

The concept of cultural heritage encompasses both tangible and intangible manifestations, constituting a key resource for strengthening territorial identity and promoting sustainable development. Tangible heritage includes historic buildings, archaeological sites, traditional infrastructure, and cultural landscapes, which bear witness to the evolution of territories [6]. In sparsely populated areas, heritage is expressed as

networks of tangible and intangible elements that reflect historical and cultural processes [7].

On the other hand, intangible heritage comprises practices, oral expressions, rituals, ancestral knowledge, and living traditions that reinforce collective identity [8]. A notable example is the weaving of knotted rugs in Guano, Ecuador, where ancestral spinning and natural dyeing techniques symbolize cultural resilience. The interaction between tangible and intangible heritage generates meaningful cultural expressions, such as in German Christmas markets, where tangible objects convey festive practices and deep cultural meanings [9].

Gastronomic heritage also reflects this integration. In regions such as Vojvodina, ethnic diversity has given rise to culinary traditions that are an essential part of heritage and strengthen tourism offerings [10]. Similarly, Serbian rakija is not only a product but also a cultural symbol that articulates social practices and expresses identity [11].

In urban environments, tangible immovable heritage is a strategic asset for sustainable development. Matanzas, Cuba, exemplifies how historic architecture can differentiate a tourist destination if integrated conservation and enhancement policies are implemented. The Coffee Cultural Landscape in Colombia represents a model of heritage-based territorial development that integrates traditional agricultural practices, rural architecture, and social expressions, showing that heritage management is an active driver of innovation and sustainability [12].

According to [13], heritage enhancement transcends the cultural sphere, encompassing social and economic impacts that enhance well-being and community cohesion. However, it faces challenges such as climate change and uncontrolled urban expansion. Against this backdrop, linguistic heritage is crucial; the Ladin language in South Tyrol exemplifies how language is an essential component of identity and enriches tourism authenticity.

As pointed out by [14], expanding access to neuroscientific knowledge is essential to improving community heritage management, empowering communities to articulate their identity and value their cultural landscapes. Consequently, [15] highlight the use of neuro-wearable technologies (e.g., fNIRS) to study how symbolic, cultural, and environmental factors influence brain function and the construction of a sense of territorial belonging.

These approaches demonstrate that both tangible and intangible heritage are cultural resources and symbols through which communities construct and express their collective identity.

function and their role in the formation of a sense of territorial belonging.

B. Territorial Identity

Territorial identity is fundamental to understanding the cultural and emotional meanings that people attribute to a place. This identity arises from the constant interaction between tangible and intangible elements of the territory and the collective perceptions that are constructed around them. For example, intangible heritage, such as weaving techniques in Guano, strengthens community identity and acts as a symbol of resistance to the cultural homogenization driven by globalization [9].

Collective memory is manifested in the territorial landscape through practices, buildings, ritual spaces, and traditions that generate a sense of belonging. However, urban and social transformations can weaken this emotional connection and erode local identity [16]. Therefore, preserving not only physical objects but also memories and emotions linked to the territory is key to identity resilience.

Studies such as that of the Chilejkar ethnographic group show how preserved cultural traditions constitute an active cultural capital that sustains identity, promotes social cohesion, and fosters local development [17]. In light of this, the dry stone constructions recognized by UNESCO reflect both cultural identity and environmental adaptation, highlighting the symbolic and ecological value of this intangible heritage [18].

The emotions that heritage elements arouse in visitors and residents strengthen the symbolic construction of the territory. Cognitive and emotional responses, such as the appreciation of authenticity and admiration, contribute to shaping the overall image of the destination [19]. On-site experiences reinforce symbolic links through emotion and memory.

In this context, territorial marketing and place branding are strategic tools for managing internal and external perceptions. Their objective is to build a positive image, increase visibility and competitiveness, and consolidate a coherent visual identity that connects emotionally with the public [20].

The incorporation of neuroscientific approaches provides new tools for understanding how visual and sensory stimuli impact the perception of the territorial brand. Neuromarketing and neuroaesthetic techniques, such as eye-tracking, EEG, and galvanic skin response, allow us to measure attention, emotions, and neural activation, providing objective data on communicative effectiveness [21]. For example, [2] show that brand personality traits influence attention and emotional response in territorial marketing.

Finally, the integration of immersive technologies, such as virtual and augmented reality, combined with neuroscientific metrics, improves territorial attraction and personalizes tourist experiences. This enhances visitors' emotional engagement and improves their perception and memory of the territory [22]. Understanding how individuals interpret and respond to territorial stimuli is essential for analyzing consumer behavior.

C. Algorithmic Interpretations of the Mind: Risks and Promises of AI-Neuro Integration

Consumer decision-making regarding territory is not based solely on rational assessments, but is deeply influenced by emotional and unconscious factors. In accordance with [23], between 85% and 95% of decisions are generated unconsciously, mediated by sensory stimuli, emotions, and previous experiences. Their model of emotional availability highlights elements such as attention, memory, emotion, and impulse as key triggers of behavior. In line with this, [24] argue that traditional self-assessment methods are insufficient to capture these processes, and propose the use of neuromarketing

techniques such as electroencephalography (EEG) and functional magnetic resonance imaging (fMRI), which have shown that brain regions such as the hippocampus and occipital lobe are activated by sensory and emotional stimuli, even in decisions that appear to be rational.

Various studies, such as those by [25] confirm that beta and gamma brain waves are associated with a preference for functional products, implying that adequate sensory stimulation can positively influence territorial decisions by activating brain patterns related to satisfaction and motivation. Predictively, [26] developed an intelligent EEG-based model with 84% accuracy to anticipate purchase intentions and affective attitudes, paving the way for territorial marketing strategies more aligned with the genuine emotions of residents and visitors.

Likewise, [27] show that emotional contagion induced by emotional reviews can be measured using EEG and galvanic skin response (GSR), affecting both consumer attention and memory. [28] complement this approach with a triangulated methodology that integrates neurophysiological, psychometric, and behavioral data, allowing for a more accurate interpretation of unconscious emotional influences. This line of work is reinforced by [29], who emphasize that the combined use of tools such as EEG, eye-tracking, and GSR facilitates a deeper analysis of how visual, emotional, and symbolic stimuli influence territorial perception. The strategic management of visual attention, positive emotional activation, and the generation of lasting memories are essential elements for influencing territorial decisions in competitive contexts.

Various studies agree that the choice of territories is the result of a complex interaction between sensory stimuli, unconscious emotions, and brain patterns [3], [4], which justifies the design of more authentic and emotionally meaningful experiences. In this process, techniques such as EEG, fMRI, eye-tracking, and GSR allow us to capture implicit reactions that shape the image of the destination. The emotional construction of this image is based on visual perceptions and symbolic attributes associated with the territory. [2] demonstrated that dimensions such as the sincerity and sophistication of the territorial brand personality directly impact visual attention and emotional activation, strengthening the emotional bond with the place.

[30] argues that territorial brands act as emotional extensions of consumer identity, linking symbolic associations with personal aspirations and reinforcing emotional attachment to place.

A comprehensive understanding of the neurological mechanisms that underpin emotional brand perception offers novel approaches to territorial marketing. [31] employed explainable artificial intelligence (xAI) models in conjunction with functional magnetic resonance imaging (fMRI) to examine the encoding of brand preferences in the early visual regions of the brain. Their findings suggest that affective differentiation toward brands, and consequently toward territories, occurs in the early stages of visual processing through emotional processes distributed across various brain regions. This evidence underscores the importance of designing strategic visual stimuli that trigger favorable emotional responses from the first moments of exposure.

Current evidence across the literature indicates a clear consensus: emotional responses exert a substantial impact on how consumers perceive and behave toward territories. The integration of neuromarketing and neuroscience tools facilitates the capture of authentic emotional responses that extend beyond declarative discourse. This capacity enables territorial managers to formulate communication and positioning strategies that are founded on positive emotional stimulation, the construction of symbolic identity, and the fortification of emotional bonds with territories.

The study of consumers' perceptions of territories cannot be understood solely through rational mechanisms; rather, they are the result of deep emotional and cognitive processes that neuroscience has begun to reveal. Research by [3], visual stimuli have been identified as a primary factor contributing to consumer perception, with a reported 78% of responses attributing importance to this aspect. This underscores the necessity for the development of strategic marketing initiatives that are designed to elicit an effective response within the initial moments of exposure. The majority of purchasing and territorial choice decisions are made unconsciously, guided by automatic brain mechanisms.

The tourist experience is a key context for observing how emotions influence territorial perception. Concepts such as neurotourism [22] and brand personality [2] demonstrate how tools like EEG, eye-tracking, and GSR can capture spontaneous emotional responses and strengthen affective bonds with destinations.

Cultural neuroscience also offers new perspectives on the analysis of territorial perception. [15] underscores the utilization of portable technologies, including functional near-infrared spectroscopy (fNIRS), which facilitates the measurement of brain responses in natural and community settings. This facilitates the analysis of how the symbolic, cultural, and social elements of territories impact the structure and functioning of the human brain.

From an integrative methodological perspective, [29] demonstrate the importance of combining various techniques, such as electroencephalography (EEG), eye-tracking, and functional magnetic resonance imaging (fMRI), to obtain a more complete view of the processes of attention, emotion, and memory in consumer behavior. This hybrid approach facilitates a more precise understanding of how territories capture attention, evoke emotions, and become consolidated in the memory of visitors or residents.

As stated [32], neuroeconomics offers further support for these findings by demonstrating that consumer decisions, including territorial choice, result in the activation of specific brain regions, such as the orbitofrontal cortex and ventral striatum. These regions have been associated with reward and value processing. The integration of methodologies, including portable fNIRS and eye-tracking, presents novel opportunities to examine territorial perception and decision-making in authentic contexts.

The impact of sensory stimuli on territorial perception has also been validated in studies applied to the field of aromachology. [33] demonstrated that the strategic incorporation of aromas in

commercial spaces improves the consumer's emotional experience, increasing positive perception of the environment and promoting affective loyalty to the territory.

With respect to technological advances, [24] underscore the significance of functional magnetic resonance imaging (fMRI) in facilitating high-resolution spatial mapping of the neural correlates of emotions, impulsivity, and economic value. However, its applicability in natural contexts remains limited by logistical and cost issues. Therefore, the combination of fMRI with portable techniques such as EEG and eye-tracking emerges as a promising solution for analyzing territorial experiences.

The proposed multilevel approach, grounded in the seminal works of [34] and [35], posits that the analysis of territorial perception must encompass the functional, algorithmic, and implementation levels. This involves comprehending the behaviors observed (functional level), the psychological processes that underpin them (algorithmic level), and the neural mechanisms that facilitate them (implementational level), thereby facilitating a more comprehensive and profound comprehension of territorial behavior.

Stress and resilience have also been identified as significant factors in the perception and decision-making processes concerning territories. As demonstrated by [36], chronic stress has been shown to influence perception, favoring negative stimuli and reducing long-term motivation, thereby adversely impacting territorial choices. Marketing strategies that reinforce emotional security and activate reward circuits could mitigate these effects, promoting a more positive perception of destinations.

Finally, [37] and [38] confirm that techniques such as EEG have established themselves as key tools in territorial marketing, tourism, and immersive experiences. Consumer neuroscience, by integrating various physiological methods, provides unprecedented opportunities to understand and enhance the emotional perception of the territory in an ethical and effective manner.

III. METHODOLOGY

Considering the recent proliferation of academic studies on a global scale, which generate voluminous amounts of information, bibliometric studies have emerged as a potent statistical instrument for the analysis and dissemination of information [39]. The present study was conducted using the Systematic Literature Review (SLR) methodology as the primary strategy for locating, analyzing, and synthesizing the most relevant studies on the processes of identifying and enhancing territorial resources, as well as on the contributions of neuroscience to territorial marketing. The process was also guided by the methodological guidelines proposed by [40], which ensure the validity, replicability, and traceability of secondary studies.

A. Phases of the Systematic Literature Review

The review was methodically organized into three primary phases:

1. Planning: The search strategy is to focus on questions.
2. Conduct: The evaluation and extraction of data must be conducted with a focus on specific objectives.
3. The ensuing report presents the findings of this investigation. The validation of criteria must be conducted with a focus on quality and relevance.

As demonstrated in the preceding section, the research was conducted in accordance with the SLR framework, guided by the guidelines established by [40]. The process was comprised of three phases, which are explained below.

B. Planning

During this phase, three research questions were formulated to guide the development of the article and organize the analysis of the selected studies. Each inquiry was meticulously aligned with a distinct objective, with all inquiries collectively contributing to an overarching overarching objective.

TABLE I
RESEARCH QUESTION AND OBJETIVES

Research questions	Specific objectives	General Objective
RQ1: What variables influence the processes of identification and valorization of territorial resources?	SO1: Determine the main variables that influence the identification and valorization of territorial resources.	To develop a systematic review of the literature that integrates the processes of identification and valorization of territorial resources with the contributions of neuroscience, in order to propose a theoretical model to guide more effective territorial marketing strategies, from an emotional and cognitive perspective.
RQ2: What role does neuroscience play in optimizing the processes of identification and valorization of territorial resources?	SO2: Evaluate the role of neuroscience in the optimization of identification and valorization processes, and its impact on territorial marketing.	
RQ3: How can neuroscientific variables, methodologies and contributions be integrated into a theoretical model applicable to territorial marketing?	SO3: To develop a theoretical model that relates the identified variables, the classified methodologies and the neuroscientific contributions, oriented to improve territorial marketing strategies.	

Note. Own elaboration

C. Inclusion and exclusion criteria

The protocol employed for this review, as well as the guidelines that were applied for the selection and evaluation of relevant studies, were defined as follows:

TABLE 2
CRITERIA MATRIX

Criterion	Selection or inclusion
Data base	Web of Science
Keywords	Types of heritage, neuroscience, territorial marketing, consumer behavior, and neuromarketing
Period	From 2019 onwards
Type of document	Peer-reviewed scientific articles
Journal type	Open Access
Language	English and Spanish

Note. Own elaboration

These selection criteria allowed the search to be focused on high-quality and relevant studies. The choice of reliable databases, specific keywords, and filters such as language, date, and document type ensured the rigor and relevance of the selected articles.

D. Conduction

In the conduction phase, various combinations of keywords were applied in the Web of Science (WoS) database to locate relevant studies that would answer the research question. Table 3 presents a synopsis of the results obtained at this stage, including the number of articles that were identified and those that were ultimately selected for analysis.

TABLE 3
SEARCH FOR SCIENTIFIC ARTICLES

Search	Database	Key words	Number of articles found and filtered	Number of final articles
1	Wos	cultural heritage AND territorial marketing	31	5
2	Wos	Cultural heritage AND Neuromarketing	1	1
3	Wos	Neuroscience OR neuromarketing	67.154	14
4	Wos	Consumer behavior and neuromarketing	151	6
5	Wos	Consumer behavior AND neuroscience	232	4
6	Wos	Territorial heritage	807	3
7	Wos	Territorial marketing	1170	2
8	Wos	Intangible and tangible heritage	486	1
9	Wos	Intangible heritage	2035	2
10	Wos	Tangible heritage	785	2
11	Wos	Intangible cultural	24.078	1
12	Wos	Cultural heritage AND Neuroscience	48	3
13	Wos	Heritage AND marketing	1932	2
14	Wos	Types of heritage	5068	3
15	Wos	Neuroscience AND heritage	123	2
			Total items	51

E. Report of results

In this final stage of the methodological process, the selected studies were reviewed based on the previously established inclusion and exclusion criteria, paying particular attention to their relevance with respect to the research questions. A comprehensive review was conducted, with the following factors being given particular consideration: the type of source (i.e., refereed scientific journals), access to the full text, temporal validity (ranging from 2019 to 2025), and the thematic relationship with the main axes of the study, which include heritage, territorial marketing, emotional perception, and neuroscience contributions.

IV. ANALYSIS OF RESULTS

The following section presents the primary findings of this systematic review, which are organized according to the three research questions posed during the methodological planning stage.

Research Question 1 (RQ1): A comprehensive investigation was conducted to identify the key variables that influence the processes of identification and valorization of territorial resources. The identified variables include territorial identity, cultural heritage (both tangible and intangible), emotional perception, authenticity, community participation, and the symbolic and tourism value of the territory. As demonstrated in the studies conducted by [4] and [41], it is imperative to acknowledge the dynamic and socially constructed nature of heritage. In a similar vein, [42]) and [37] have introduced emerging neurocognitive variables, such as empathy, attention, and emotional memory, which impact the perception and resignification of territories.

Research Question 2 (RQ2): There has been an increasing use of neuroscientific tools to understand territorial consumer behavior. Recent research highlights that many territorial consumption decisions occur unconsciously, influenced by sensory and emotional stimuli [23]. A variety of technologies are employed in this context, including electroencephalography (EEG), eye-tracking, galvanic skin response (GSR), virtual reality (VR), and facial analysis. These methodologies enable the measurement of attention, cognitive load, and emotions, thereby facilitating the design of customized experiences[37], [38]. It is also noteworthy to mention applications such as neurotourism [22] and immersive museums [43], which reinforce the use of real-time emotional metrics.

The third research question (RQ3) posits the following: The proposed integrative theoretical model articulates three dimensions: the structural elements of the territory, the neurocognitive processes of the consumer, and the use of applied technologies. At the structural level, heritage and territorial identity emerge as central components of symbolic value. As emphasized by [6], this value must be understood from a participatory and emotional logic. At the perceptual level, attention, symbolic evocation, and empathy are fundamental for the emotional connection with the territory[44], [45]. The employment of neuroscientific instruments facilitates the identification of stimuli that exert the most significant cognitive and affective influence[26]. This underscores the symbolic perception of the territory and its subsequent recollection [46].

A review of the extant literature highlights that emotions generated through interaction with the territory play a pivotal role in forging symbolic bonds between visitors and place. As [2] and [46] emphasize, such emotionally charged experiences strengthen destination positioning by enhancing recall, fostering symbolic loyalty, and supporting the creation of authentic and emotionally resonant value propositions. Thus, emotions should be regarded as a strategic asset for achieving symbolic and emotional differentiation in territorial marketing.

The following proposition is hereby put forward for consideration in future research:

TP01- Emotional experience contributes to the development of territorial marketing strategies.

The emotions evoked by the territorial environment have been shown to not only engender affective bonds among individuals but also to activate brain mechanisms associated with attention, emotional coding, and symbolic memory. As demonstrated by [22] and [27], these processes are initiated prior to conscious reasoning, thereby facilitating enhanced retention of stimuli in the visitor's mind. The process of deep emotional processing has been demonstrated to enhance the evocation of symbolic meanings and to favor the re-signification of the territory. In this sense, the emotional experience is not only an end in itself, but also serves as a catalyst for pivotal neurocognitive responses in the interpretation of space.

On the basis of the evidence presented, the following proposition is substantiated:

TP02-Emotional experience stimulates neurocognitive processing mechanisms.

The advent of knowledge regarding the brain's response to symbolic and emotional stimuli has enabled the development of more efficacious territorial marketing strategies. [27] and [26] have noted that tools such as electroencephalography (EEG), eye-tracking, and facial recognition can be utilized to identify patterns of attention and emotion. These patterns, in turn, can be leveraged to optimize messages, designs, and experiences. This neuroscientific basis enables the development of strategies that are not solely predicated on declared perceptions but also on authentic and quantifiable responses, thereby facilitating a more precise, personalized, and emotionally resonant communication with the target audience.

The results obtained allow us to establish the following key idea related to territorial marketing:

TP03-Neurocognitive processing improves the effectiveness of territorial marketing strategies.

A comprehensive review of the literature reveals that both tangible and intangible territorial heritage play a crucial role in eliciting emotional responses that foster a deeper connection with the territory. According to [47], cultural manifestations that resonate with personal or collective identity can provoke strong emotional experiences. In line with this, [6] argue that heritage value should be understood from a dynamic and emotional perspective, linked to participation, rootedness, and territorial pride.

This emotional response is further intensified when heritage elements evoke symbolic memories and collective narratives, as shown by [44]. Emotions such as nostalgia, admiration, and awe influence how individuals re-signify a place. As [45] demonstrate, this emotional perception enhances the visitor's experience and directly impacts satisfaction, memory retention, and the intention to recommend the destination.

From a neuroscientific perspective, [3] and [46] show that visual and symbolic heritage stimuli activate brain regions associated with pleasure and emotional memory, contributing to enduring emotional connections and reinforcing symbolic loyalty.

In light of these findings, the following proposition is advanced:

TP04-Territorial heritage positively influences emotional experience.

Numerous studies have shown that territorial identity holds symbolic and cultural value while also acting as an emotional catalyst in the individual’s interaction with their environment. As noted by [44], when individuals perceive a meaningful connection with their territory, emotions such as pride,

nostalgia, belonging, or affection are activated. This connection, rooted in cultural, traditional, and collective self-recognition, reinforces the emotional bond with the place.

Similarly, [3] argues that territorial identity deepens the processing of symbolic stimuli, facilitating meaningful experiences. This emotional dimension significantly influences how people perceive, evaluate, and choose territories, particularly in tourism, cultural consumption, and mobility contexts. Emotional evocation linked to belonging strengthens the territory's image and symbolic appeal, directly impacting decision-making.

In addition, identity ties can trigger emotional memories that enrich how places are experienced and remembered. As [6] highlights, territorial identity is central to cultural sustainability, as it fosters lasting emotional bonds between communities and their environment.

The aforementioned evidence substantiates the following proposition:

TP05-Territorial identity contributes to emotional experience.

A substantial body of research supports the idea that territorial identity significantly influences neurocognitive processes related to attention, memory, and symbolic interpretation. According to [3], the emotional bond with a territory enhances symbolic processing and promotes selective attention, leading to improved recall of salient stimuli. This is reinforced by [24], who found that identity connections trigger stronger neurocognitive responses and facilitate emotional encoding of territorial experiences.

Research conducted by [26] and [27] demonstrate that symbolic stimuli landscapes, architecture, or cultural elements activate brain regions linked to emotion and episodic memory, reinforcing experience and influencing destination valuation. Likewise, [42] report that territorial identity increases sustained attention and emotional recognition, fostering deeper environmental engagement. [44] emphasize that identification with a territory activates symbolic evocation, enriching cognitive interpretation by linking symbols to personal memories and shared values. As [6] note, this symbolic layer connects collective identity with individual experience, improving the brain's integration of territorial stimuli.

Based on this evidence, the following proposition is made:

TP06-Territorial identity influences neurocognitive processing.

The efficacy of neuroscientific technologies in measuring and validating neurocognitive responses to territorial stimuli has been widely demonstrated. Tools such as electroencephalogram (EEG), eye-tracking, galvanic skin response (GSR), and facial expression analysis (FaceReader) have enabled researchers to assess attention, brain activation, and emotional reactions in response to environmental elements [26], [48]. These instruments overcome the limitations of conventional self-report methods by capturing nonconscious processes objectively [38], [42].

Eye-tracking has helped identify the most attention-grabbing visual elements in territorial settings, while EEG has documented the cognitive load and emotional states associated with symbolic stimuli such as landscapes, sounds, and cultural narratives [37], [46]. This has deepened our understanding of how such stimuli influence perception and memory.

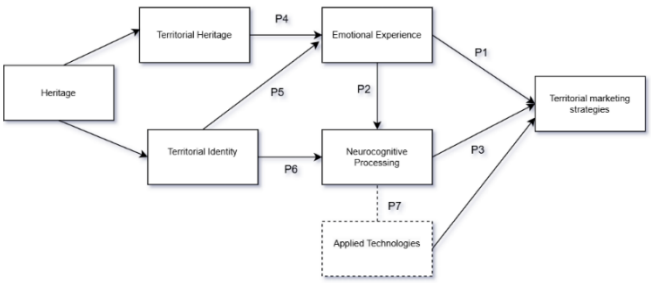
Moreover, the integration of these technologies in applied research has validated territorial marketing strategies by grounding communication and design decisions in actual brain responses rather than subjective impressions [22], [27]. This supports the development of more effective, personalized, and emotionally resonant territorial experiences.

Based on these findings, the following proposition is made**:**

TP07-Applied neuroscience technologies enable the measurement and validation of neurocognitive responses.

The theoretical model that encapsulates the proposed relationships between the primary constructs examined in this study is presented below. The model presented herein has been constructed based on a comprehensive review of the literature and the theoretical propositions previously presented.

Figure 1
Theoretical model



V. DISCUSSION AND REMARKABLE CONCLUSION

The findings of this systematic review confirm that emotional and neurocognitive processes are central to how territories are perceived, remembered, and valued. Studies consistently show that variables such as visual attention, symbolic evocation, and territorial identity strongly influence the formation of affective bonds with place [2], [3], [22]. These connections are rooted in brain mechanisms that process visual and cultural stimuli, enhancing the visitor's experience [26], [27].

Unlike traditional approaches that prioritize physical or economic attributes, recent literature emphasizes the symbolic and emotional dimensions of territorial perception. As [6] demonstrate, territories gain value when they resonate emotionally with individuals. Emotional memory and collective identity allow places to be re-signified beyond their functional purpose [44], [47].

The integration of neuroscientific tools such as electroencephalogram (EEG), eye-tracking, and galvanic skin response (GSR**)** provides objective data to assess the emotional and cognitive impact of territorial stimuli [24], [38]. These techniques support the design of more effective strategies, especially in contexts affected by cultural homogenization, depopulation, or identity loss [14], [48].

From a theoretical standpoint, this review posits that territorial valorization must consider the emotions and symbolic narratives that define place attachment. Research by [45] and [46] supports this view, showing that emotionally intense experiences enhance recall, satisfaction, and destination loyalty.

Nonetheless, significant gaps remain. There is a lack of applied studies that integrate heritage, neuroscience, and territorial marketing, and the scarcity of research from Latin America limits the contextual scope of existing models.

In sum, the findings reveal a paradigm shift toward a territorial marketing approach that emphasizes sensory, emotional, and human-centered strategies. This perspective not only strengthens territorial positioning but also promotes cultural and symbolic resilience through more sustainable and socially meaningful interventions.

6. CONCLUSIONS

The present study was conducted to ascertain the influence of emotional and neurocognitive variables on the perception and symbolic valorization of the territory. This objective was pursued through a systematic review of the extant literature. A series of studies have demonstrated that factors such as visual attention, emotional memory, and territorial identity play a pivotal role in the formation of affective bonds between individuals and the spaces they inhabit or frequent.

The primary contribution of this research is the formulation of a relational theoretical model that articulates six fundamental dimensions: territorial heritage, territorial identity, emotional experience, neurocognitive processing, applied technologies, and territorial marketing strategies. This interdisciplinary approach integrates knowledge from marketing, neuroscience, and consumer psychology, thereby broadening the conceptual framework of contemporary territorial marketing.

From a pragmatic standpoint, the findings provide a framework for the development of more efficacious communication strategies, predicated on stimuli that elicit a genuine emotional response in the public. Furthermore, they contribute significantly to the formulation of public policies and the development of local initiatives focused on fortifying cultural identity and a sense of belonging.

A primary constraint of the study is the dearth of literature that collectively addresses the variables examined from an applied perspective, as well as the limited representation of studies conducted in Latin America.

These limitations impose constraints on the contextual applicability of the proposed model and generate new opportunities for future research. Consequently, it is recommended that empirical studies be conducted to validate the proposed theoretical model, applying mixed methodologies and expanding geographic diversity. The design of participatory tools incorporating neuroscientific technologies to evaluate the territorial experience from an emotional, symbolic, and community perspective is also suggested.

In summary, the present study contributes to a re-signification of the manner in which territories are understood, communicated, and valued. It establishes emotions, memory, and identity as the foundation for sustainable, authentic, and people-centered territorial development.

REFERENCES

[1] A. M. Rodríguez, J. T. Díaz, and R. C. P. García, "Identificación del patrimonio cultural tangible inmueble para el desarrollo del turismo local. Caso Matanzas," vol. 10, no. 1.

[2] V. Calderón-Fajardo, R. Anaya-Sánchez, F. Rejón-Guardia, Department of Business Management, Faculty of Economics and Business, University of Malaga, Malaga, Spain, Sebastian Molinillo, and Department of Business Management, Faculty of Economics and Business, University of Malaga, Malaga, Spain, "Neurotourism Insights: Eye Tracking and Galvanic Analysis of Tourism Destination Brand Logos and AI Visuals," *Tour. Manag. Stud.*, vol. 20, no. 3, pp. 53–78, May 2024, doi: 10.18089/tms.20240305.

[3] A. Ballı, "Comparison of Studies Conducted in the Field of Neuromarketing and Artificial Intelligence Using Bibliometric Method," *Mehmet Akif Ersoy Üniversitesi İktisadi Ve İdari Bilim. Fakültesi Derg.*, Aug. 2024, doi: 10.30798/makuiibf.1416687.

[4] S. De-Frutos-Arranz and M.-F. B. López, "The State of the Art of Emotional Advertising in Tourism: A Neuromarketing Perspective," *Tour. Rev. Int.*, vol. 26, no. 2, pp. 139–162, Apr. 2022, doi: 10.3727/154427221X16317419620246.

[5] P. Sánchez-Núñez, M. J. Cobo, G. Vaccaro, J. I. Peláez, and E. Herrera-Viedma, "Citation Classics in Consumer Neuroscience, Neuromarketing and Neuroaesthetics: Identification and Conceptual Analysis," *Brain Sci.*, vol. 11, no. 5, p. 548, Apr. 2021, doi: 10.3390/brainsci11050548.

[6] B. D. Espino Hidalgo and R. Horeczki, "Innovative and Sustainable Cultural Heritage for Local Development in the Face of Territorial Imbalance," *ACE Archit. City Environ.*, vol. 17, no. 50, Oct. 2022, doi: 10.5821/ace.17.50.11374.

[7] M. Linares Gómez Del Pulgar, M. López Sánchez, C. V. Gilabert, M. Á. Antonio-García, F. Sánchez-Salazar, and A. Tejedor Cabrera, "A Territorial Strategy for the Activation of Tourism in Low Population Density Heritage Landscapes," *Land*, vol. 13, no. 5, p. 574, Apr. 2024, doi: 10.3390/land13050574.

[8] C. Vegheș, "Cultural Heritage and Nation Branding: A Marketing Driver for Sustainable Development," *Eur. J. Sustain. Dev.*, vol. 11, no. 1, p. 42, Feb. 2022, doi: 10.14207/ejsd.2022.v11n1p42.

[9] C. P. Maldonado-Erazo, S. M. Zurita-Polo, M. D. L. C. Del Río-Rama, and J. Álvarez-García, "Cultural Dimensions of Territorial Development: A Plan to Safeguard the Intangible Cultural Heritage of Guano's Knotted Carpet Weaving Tradition, Chimborazo, Ecuador," *Heritage*, vol. 8, no. 2, p. 60, Feb. 2025, doi: 10.3390/heritage8020060.

[10] B. Kalenjuk Pivarski *et al.*, "Factors Affecting the Consumption of Traditional Food in Tourism—Perceptions of the Management Sector of Catering Facilities," *Foods*, vol. 12, no. 12, Art. no. 12, Jun. 2023, doi: 10.3390/foods12122338.

[11] S. Adžić, M. Pavlović, M. Milunović, Đ. Pavlović, T. Savić Tot, and P. Radanov, "THE IMPACT OF RAKIJA CULTURAL HERITAGE AND RAKIJA MARKETING ON THE CONSUMER PURCHASING DECISIONS," *Ekon. Poljopr.*, vol. 71, no. 3, pp. 923–941, Oct. 2024, doi: 10.59267/ekoPolj2403923A.

[12] A. M. Rodríguez, J. T. Díaz, and R. C. P. García, "Identificación del patrimonio cultural tangible inmueble para el desarrollo del turismo local. Caso Matanzas," vol. 10, no. 1, 2022.

[13] G. E. Halkos, P. C. Koundouri, P.-S. C. Aslanidis, and A. Plataniotis, "Evaluating the tangible and intangible parameters of cultural heritage: an economic meta-analysis in a global context," *Discov. Sustain.*, vol. 5, no. 1, p. 187, Aug. 2024, doi: 10.1007/s43621-024-00398-w.

[14] V. Russo *et al.*, "The Role of the Emotional Sequence in the Communication of the Territorial Cheeses: A Neuromarketing Approach," *Foods*, vol. 11, no. 15, Art. no. 15, Jan. 2022, doi: 10.3390/foods11152349.

[15] M. M. Arredondo, "Shining a light on cultural neuroscience: Recommendations on the use of fNIRS to study how sociocultural contexts shape the brain.," *Cultur. Divers. Ethnic Minor. Psychol.*, vol. 29, no. 1, pp. 106–117, Jan. 2023, doi: 10.1037/cdp0000469.

[16] M. Wang, M. Zhao, M. Lin, W. Cao, H. Zhu, and N. An, "SEEKING LOST MEMORIES: APPLICATION OF A NEW VISUAL METHODOLOGY FOR HERITAGE PROTECTION," *Geogr. Rev.*, vol. 110, no. 4, pp. 556–574, Oct. 2020, doi: 10.1080/00167428.2020.1715800.

[17] L. Lenovský and L. Kurajda, "Cultural Heritage and Cultural Potential: The Use of Cultural Heritage on the Example of an Ethnographic Group," *Muzeol. Kultúrne Dedičstvo*, vol. 10, no. 1, pp. 79–104, 2022, doi: 10.46284/mkd.2022.10.1.5.

[18] C. Jiménez De Madariaga, "Dry stone constructions – intangible cultural heritage and sustainable environment," *J. Cult. Herit. Manag. Sustain. Dev.*, vol. 11, no. 4, pp. 614–626, Oct. 2021, doi: 10.1108/JCHMSD-12-2020-0180.

[19] M. Royo Vela and A. Garzón Paredes, "Effects of heritage on destination image: multi-method research based on an appraisal approach to emotional response in-situ," *J. Herit. Tour.*, vol. 18, no. 4, pp. 531–555, Jul. 2023, doi: 10.1080/1743873X.2023.2178926.

[20] O. Nemyrovska and O. Ievseitseva, "Digital visibility and competitive edge: Analyzing the impact of territorial marketing on regional competitiveness," *J. East. Eur. Cent. Asian Res. JEECAR*, vol. 11, no. 3, pp. 573–587, Jun. 2024, doi: 10.15549/jeecar.v11i3.1640.

[21] P. Sánchez-Núñez, M. J. Cobo, G. Vaccaro, J. I. Peláez, and E. Herrera-Viedma, "Citation Classics in Consumer Neuroscience, Neuromarketing and Neuroaesthetics: Identification and Conceptual Analysis," *Brain Sci.*, vol. 11, no. 5, p. 548, Apr. 2021, doi: 10.3390/brainsci11050548.

[22] L. Cardoso and C. Fraga, "Shaping the Future of Destinations: New Clues to Smart Tourism Research from a Neuroscience Methods Approach," *Adm. Sci.*, vol. 14, no. 6, p. 106, May 2024, doi: 10.3390/admsci14060106.

[23] F. G. Louro and R. A. Barboza, "Neuromarketing: explorando o lado inconsciente do consumo," *ReMark - Rev. Bras. Mark.*, vol. 23, no. 1, pp. 252–299, Feb. 2024, doi: 10.5585/remark.v23i1.23541.

[24] A. H. Alsharif, N. Z. M. Salleh, A. R. Hashem E, A. Khraiwish, L. Putit, and L. S. M. Arif, "Exploring Factors Influencing Neuromarketing Implementation in Malaysian Universities: Barriers and Enablers," *Sustainability*, vol. 15, no. 5, Art. no. 5, Jan. 2023, doi: 10.3390/su15054603.

[25] J. J. Moreno-Escobar, V. D. J. Pérez-Franco, A. L. Coria-Páez, O. Morales-Matamoros, E. Y. Aguilar-del-Villar, and M. D. Castillo-Perez, "Multivariate Data Analysis of Consumer Behavior of Functional Products: A Neuroscience and Neuromarketing Approach to Improve Decision-Making," *Comput. Sist.*, vol. 27, no. 4, Dec. 2023, doi: 10.13053/cys-27-4-4690.

[26] F. R. Mashrur *et al.*, "BCI-Based Consumers' Choice Prediction From EEG Signals: An Intelligent Neuromarketing Framework," *Front. Hum. Neurosci.*, vol. 16, p. 861270, May 2022, doi: 10.3389/fnhum.2022.861270.

[27] C. Herrando, J. Jiménez-Martínez, M. J. Martín-De Hoyos, and E. Constantinides, "Emotional contagion triggered by online consumer reviews: Evidence from a neuroscience study," *J.*

Retail. Consum. Serv., vol. 67, p. 102973, Jul. 2022, doi: 10.1016/j.jretconser.2022.102973.

[28] S. Cao, M. Foth, W. Powell, and J. McQueenie, "What Are the Effects of Short Video Storytelling in Delivering Blockchain-Credentialed Australian Beef Products to China?," *Foods*, vol. 10, no. 10, Art. no. 10, Oct. 2021, doi: 10.3390/foods10102403.

[29] Z. Zhu, Y. Jin, Y. Su, K. Jia, C.-L. Lin, and X. Liu, "Bibliometric-Based Evaluation of the Neuromarketing Research Trend: 2010–2021," *Front. Psychol.*, vol. 13, p. 872468, Aug. 2022, doi: 10.3389/fpsyg.2022.872468.

[30] D. Jukić, "Beyond Brand Image: A Neuromarketing Perspective," *Commun. Today*, pp. 22–38, Apr. 2023, doi: 10.34135/communicationtoday.2023.Vol.14.No.1.2.

[31] J. P. Marques Dos Santos and J. D. Marques Dos Santos, "Explainable artificial intelligence (xAI) in neuromarketing/consumer neuroscience: an fMRI study on brand perception," *Front. Hum. Neurosci.*, vol. 18, p. 1305164, Mar. 2024, doi: 10.3389/fnhum.2024.1305164.

[32] S. Schukat, M. Diekmann, and H. Heise, "What links neuroscience to agricultural economics? A review of neuroscientific methods literature in agricultural economic research and marketing," *Int. Food Agribus. Manag. Rev.*, vol. 24, no. 6, pp. 935–950, Oct. 2021, doi: 10.22434/IFAMR2020.0141.

[33] J. Berčík, K. Neomániová, J. Gálová, and A. Mravcová, "Consumer Neuroscience as a Tool to Monitor the Impact of Aromas on Consumer Emotions When Buying Food," *Appl. Sci.*, vol. 11, no. 15, p. 6692, Jul. 2021, doi: 10.3390/app11156692.

[34] J. A. Clithero, U. R. Karmarkar, G. Nave, and H. Plassmann, "Reconsidering the path for neural and physiological methods in consumer psychology," *J. Consum. Psychol.*, vol. 34, no. 1, pp. 196–213, Jan. 2024, doi: 10.1002/jcpy.1397.

[35] D. Serra, "Decision-making: from neuroscience to neuroeconomics—an overview," *Theory Decis.*, vol. 91, no. 1, pp. 1–80, Jul. 2021, doi: 10.1007/s11238-021-09830-3.

[36] R. Dickinson, R. Miller, and E. T. Beeson, "Leveraging Neuroscience-Informed Resilience Principles to Support Clients' Career Decision-Making," *Career Dev. Q.*, vol. 69, no. 4, pp. 340–354, Dec. 2021, doi: 10.1002/cdq.12278.

[37] A. Costa-Feito, A. M. González-Fernández, C. Rodríguez-Santos, and M. Cervantes-Blanco, "Electroencephalography in consumer behaviour and marketing: a science mapping approach," *Humanit. Soc. Sci. Commun.*, vol. 10, no. 1, p. 474, Aug. 2023, doi: 10.1057/s41599-023-01991-6.

[38] L.-A. Casado-Aranda and J. Sanchez-Fernandez, "Advances in neuroscience and marketing: analyzing tool possibilities and research opportunities," *Span. J. Mark. - ESIC*, Feb. 2022, doi: 10.1108/SJME-10-2021-0196.

[39] A. Massimo and C. Corrado, "bibliometrix: An R-tool for comprehensive science mapping analysis," *J. Informetr.*, vol. 11, no. 4, pp. 959–975, Nov. 2017, doi: 10.1016/j.joi.2017.08.007.

[40] P. Brereton, B. A. Kitchenham, D. Budgen, M. Turner, and M. Khalil, "Lessons from applying the systematic literature review process within the software engineering domain," *J. Syst. Softw.*, vol. 80, no. 4, Art. no. 4, Apr. 2007, doi: 10.1016/j.jss.2006.07.009.

[41] A. Pastor Pérez and M. Díaz-Andreu, "Evolución de los valores del patrimonio cultural," *Rev. Estud. Soc.*, no. 80, pp. 3–20, Apr. 2022, doi: 10.7440/res80.2022.01.

[42] M. M. D. C. L. Peixoto, C. A. Gonçalves, and E. C. D. Silva, "Proposição do Framework ISIE e a aplicabilidade do FaceReader para mensuração das emoções em pesquisas de marketing voltadas para o consumo sustentável," *ReMark - Rev. Bras. Mark.*, vol. 23, no. 1, pp. 97–149, Feb. 2024, doi: 10.5585/remark.v23i1.23559.

[43] Y. Hou, L. Xu, and L. Chen, "Hotspots and Cutting-Edge Visual Analysis of Digital Museum in China Using Data Mining Technology," *Comput. Intell. Neurosci.*, vol. 2022, pp. 1–16, May 2022, doi: 10.1155/2022/7702098.

[44] A. Faganel, B. Reisman, and T. Tomažič, "Heritage Tourism, Retail Revival and City Center Revitalization: A Case Study of Koper, Slovenia," *Heritage*, vol. 6, no. 12, pp. 7343–7365, Nov. 2023, doi: 10.3390/heritage6120385.

[45] X. Chen, Z. Chen, L. Xiao, and M. Zhou, "A Novel Sentiment Analysis Model of Museum User Experience Evaluation Data Based on Unbalanced Data Analysis Technology," *Comput. Intell. Neurosci.*, vol. 2022, pp. 1–10, Apr. 2022, doi: 10.1155/2022/2096634.

[46] B. Yin, Y.-B. Jiang, and J. Chen, "Realizing consumers' existential dreams via product marketing and mixed reality: a perspective based on affective neuroscience theories," *Front. Neurosci.*, vol. 17, p. 1256194, Sep. 2023, doi: 10.3389/fnins.2023.1256194.

[47] L. Xiao, "Intangible Cultural Heritage Reproduction and Revitalization: Value Feedback, Practice, and Exploration Based on the IPA Model," *Comput. Intell. Neurosci.*, vol. 2022, pp. 1–13, Aug. 2022, doi: 10.1155/2022/8411999.

[48] B. Wang *et al.*, "Aptamer Technologies in Neuroscience, Neuro-Diagnostics and Neuro-Medicine Development," *Molecules*, vol. 29, no. 5, Art. no. 5, Jan. 2024, doi: 10.3390/molecules29051124.