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Proximity Dimensions and Retail Location Choice: Evidence from Urban Supermarkets in Tangier, Morocco

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Abstract

Urban supermarkets are increasingly challenged to design spatial strategies that align with consumers' demand for convenience, accessibility, and local embeddedness. Despite the growing recognition of spatial behavior in retailing, limited research has examined how different forms of proximity jointly shape consumers' perceptions of store attractiveness and their subsequent location choices, particularly in emerging urban contexts. This study investigates how four proximity dimensions—access, identity, relational, and process proximity—affect durable and situational attractiveness, which in turn drive consumers' retail location choices. Data from 567 supermarket shoppers in Tangier, Morocco, were analyzed using a structural model integrating these spatial and behavioral constructs. Results reveal that proximity exerts a strong positive effect on store attractiveness, with access and identity dimensions emerging as the most influential drivers of consumer patronage. This study contributes to the geo-marketing and spatial consumer behavior literature by conceptualizing proximity as a multidimensional construct that bridges spatial accessibility, social attachment, and retail experience, offering new insights for localization strategies in emerging markets.

Keywords: geo-marketing; retail location; consumer spatial decision making; proximity; consumer behavior; urban supermarkets

1. Introduction

Urban retailing is undergoing a profound transformation driven by new consumption patterns, digital convenience, and evolving spatial dynamics. As cities densify and mobility constraints intensify, spatial proximity has become a decisive factor in shaping consumer choice and store performance. Supermarkets, once viewed primarily as functional outlets for mass consumption, are now reinterpreted as neighborhood anchors that mediate daily life and urban experience. This shift has placed proximity—both physical and perceived—at the core of contemporary retail strategy [1].

The concept of proximity in retailing has evolved far beyond geographic distance. It now encompasses social, cognitive, and experiential dimensions that reflect how consumers relate to retail spaces in their urban environments. Proximity expresses convenience and timesaving but also familiarity, trust, and identity. For retailers, particularly in urban settings, proximity represents an opportunity to build sustainable relationships with consumers by embedding stores within their everyday routines and local contexts. In this sense, proximity serves as both a spatial lever and a relational resource, influencing perceptions of attractiveness and ultimately guiding location decisions.



Received: 4 February 2026

Revised: 13 March 2026

Accepted: 24 March 2026

Published: 28 March 2026

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Despite the recognized importance of spatial behavior in retail marketing, research has long focused on objective locational factors such as distance, accessibility, or population density [2]. These approaches, rooted in spatial economics and gravity models, have provided strong predictive tools for catchment analysis but often fail to capture the subjective meanings consumers attach to retail proximity. Recent studies have begun to highlight the role of psychographic and behavioral variables in retail choice [3], yet there remains a limited understanding of how proximity interacts with consumers' perceptions of attractiveness and convenience within complex urban systems. Recent urban studies have addressed retail location attractiveness using spatially explicit modelling approaches. For example, [4] integrated gravity-based retail location models within a GIS environment to examine how urban form attributes and spatial accessibility shape retail attractiveness patterns. From an urban science perspective, retail attractiveness can be understood as a spatially embedded phenomenon shaped by the organization of urban space, accessibility structures, and consumers' interactions with their immediate urban environment.

Attractiveness, a central construct in retail geography and marketing, refers to a consumer's overall evaluation of a store or location based on a combination of cognitive, affective, and situational factors [5]. In the context of supermarkets, attractiveness is multidimensional—it can derive from structural attributes (e.g., accessibility, assortment, pricing) as well as relational or symbolic attributes (e.g., store identity, perceived belonging). However, while attractiveness has been widely studied as a determinant of store choice, little is known about how different proximity dimensions contribute to shaping attractiveness itself. For example, does feeling emotionally close to a neighborhood supermarket enhance its durable attractiveness, or does ease of access drive situational attractiveness more strongly? Such questions remain largely unexplored.

Furthermore, existing studies have primarily been conducted in developed economies, where urban structures, transport infrastructures, and retail formats are relatively mature. In contrast, emerging urban markets—such as those in North Africa, Latin America, or Southeast Asia—present distinct spatial and socio-economic realities that challenge conventional retail theories. These markets are characterized by hybrid consumption patterns where modern trade formats (supermarkets, convenience stores) coexist with traditional outlets, and where urban expansion creates new peripheral consumer zones. As a result, spatial proximity in these contexts may hold different meanings and behavioral implications.

Tangier, Morocco, provides an exemplary setting for investigating these dynamics. As one of the fastest-growing cities in North Africa, Tangier has experienced rapid demographic and spatial expansion, accompanied by the proliferation of supermarket chains such as Marjane Market, BIM, and Carrefour Express. This urban transformation has intensified competition among retailers seeking to capture local consumer segments while maintaining geographic convenience. Understanding how consumers perceive and act upon proximity in such an environment offers valuable insights for both theory and practice.

This study therefore addresses the following research question: To what extent do different dimensions of proximity influence consumers' perception of supermarket attractiveness and their subsequent location choice?

To answer this question, we propose a multidimensional model of proximity that integrates four complementary dimensions:

- Access proximity, referring to physical and temporal ease of reaching the store.
- Identity proximity, reflecting shared values and symbolic attachment between consumers and stores.
- Relational proximity, capturing interpersonal familiarity and trust between consumers and store personnel. And,

- Process proximity, denoting consumers' understanding of store operations and transparency in business practices.

These dimensions are hypothesized to affect two forms of attractiveness: durable attractiveness, associated with long-term loyalty and affective commitment, and situational attractiveness, related to convenience and immediate shopping needs. Together, these forms of attractiveness are expected to influence the choice of supermarket location.

Additionally, the study explores the role of accessibility as a contextual factor that can strengthen or attenuate the relationship between proximity and attractiveness. Accessibility, often treated as a purely physical construct, may instead moderate consumers' perception of convenience by interacting with their emotional and relational closeness to stores.

By empirically testing this model using data from 567 urban supermarket consumers in Tangier, this research aims to make several contributions. First, it extends the literature on retail geo-marketing by providing an integrated understanding of proximity that bridges spatial, social, and cognitive domains. Second, it advances the theory of retail attractiveness by identifying how specific forms of proximity translate into perceived store value and location preference. Third, it enriches the international perspective on consumer spatial behavior by offering empirical evidence from an emerging market context, where proximity and accessibility take on distinctive socio-spatial meanings.

From a managerial standpoint, the findings are expected to help retailers design more effective localization strategies by aligning store locations, formats, and communication with the spatial and emotional expectations of urban consumers. As retail competition intensifies, understanding the micro-geographies of consumer proximity becomes essential for sustaining differentiation, enhancing customer loyalty, and optimizing urban retail networks.

2. Literature Review and Hypothesis Development

2.1. Theoretical Foundations of Spatial and Geographic Decision Models

The study of spatial decision-making has deep roots in economic geography, where location has long been considered a determinant of economic efficiency and market interaction. The earliest formal attempts to explain spatial organization emerged from classical location theories that sought to optimize production, transport, and distribution in geographic space. These foundational models laid the groundwork for subsequent research on retail location and consumer spatial behavior.

Early formulations of spatial organization—such as the concentric land-use patterns described in classical location theory—have long emphasized the relationship between distance, transport costs, and the spatial distribution of economic activities. Although originally developed in agricultural or monocentric settings, these early models established the fundamental principle that spatial structure reflects underlying economic frictions and trade-offs. Contemporary evaluations confirm that the core logic of these theories remains relevant for understanding modern retail systems, particularly the idea that market areas and commercial catchments emerge from distance-related constraints and competitive interaction [6].

Building on these foundations, urban land-use models later formalized how commercial and residential activities compete for centrality. These frameworks argue that firms trade off accessibility, land values, and expected demand when selecting a location—a mechanism that continues to shape retail spatial patterns even in highly urbanized environments. Recent comparative studies show that classical models such as Central Place Theory, Spatial Interaction Theory, Bid Rent Theory, and the Principle of Minimum Differentiation still provide meaningful explanations for the organization of retail activity, despite being developed decades ago [7]. Their continued relevance lies in their ability to

describe how retailers position themselves relative to demand centers, competitors, and transportation networks.

More recent empirical research demonstrates that the hierarchical and competitive structures predicted by Christaller's and Lösch's formulations continue to manifest in contemporary retail systems. For example, ref. [6] shows that store attractiveness, distance to the center, and competitive proximity still follow spatial logic consistent with Central Place Theory and Spatial Interaction Theory, even in dynamic urban contexts. These findings suggest that, while retail markets have evolved, the mechanisms through which consumers access and evaluate commercial locations continue to reflect spatial patterns formalized in classical theory.

Although classical theories such as Central Place Theory, Bid Rent Theory and the Principle of Minimum Differentiation still provide the foundational logic of retail location, they suffer from a key limitation: they assume that consumers are uniform and behave rationally across geographic space. Modern research instead shows that consumer demand varies considerably with socio-economic characteristics, behavioral patterns and local context [7]. Retail location choice today therefore reflects not only distance-based optimization but also strategic planning, competition, regulatory constraints and differentiated consumer lifestyles.

Recognizing that consumer mobility and perception vary, ref. [8] proposed a probabilistic version of Reilly's model—the Huff Model of Retail Attraction. Rather than assuming that consumers patronize only the nearest store, Huff introduced probability of choice as a function of store attractiveness (A_k) and travel time (D_k), expressed as:

$$P_{ij} = \frac{A_j^\alpha D_{ij}^{-\beta}}{\sum_k A_k^\alpha D_{ik}^{-\beta}}$$

where P_{ij} is the probability that consumer i shops at store j . This shift from deterministic to behavioral logic marked the beginning of spatial consumer modelling. The model captures heterogeneity in preferences and the trade-off between distance and attractiveness, allowing marketers to simulate realistic choice patterns.

However, as highlighted by [9], the probabilistic structure of the Huff model is highly sensitive to specification uncertainty, which has motivated the development of more robust discrete-choice formulations such as multinomial logit models. More recently, these classical models have been operationalized within GIS-based analytical frameworks. Ref. [4] implemented the Huff model using spatial indicators such as store clustering, street network accessibility, and terrain slope to analyze retail attractiveness in an urban context. While these approaches emphasize the spatial configuration of retail systems, they also highlight the need to better understand how consumers perceive and evaluate proximity within complex urban environments.

Subsequent developments, particularly the Multiplicative Competitive Interaction (MCI) model, have extended the classical Huff framework by incorporating a broader set of store attributes beyond distance—such as store image, service quality, physical facilities, and pricing. Recent empirical applications demonstrate the continued relevance of this model for analyzing competitive retail environments. For example, ref. [10] showed that the MCI model provides a robust representation of consumers' store choice behavior by simultaneously accounting for location convenience, parking availability, and price levels in explaining market share distribution across minimarkets. Their findings confirm that consumers' patronage decisions emerge from a multiplicative interaction between distance-related frictions and perceived store attractiveness, reinforcing the MCI model as a flexible and powerful tool for modelling spatial competition in retail settings.

Contemporary retail location models increasingly incorporate behavioral and contextual factors, reflecting the complexity of real consumer mobility. Spatial interaction models (SIMs), which have long been used in retail planning, now integrate empirical behavioral data, trip purposes, e-commerce patterns and channel-mix decisions [11]. These modern refinements demonstrate that retail location choice is no longer a purely distance-based optimization but arises from the interplay between consumer routines, digital shopping behavior and local accessibility.

This shift from deterministic spatial rules to behavioral perspectives reflects the increasing recognition that consumers operate under bounded rationality and heterogeneous preferences, conditions that contemporary spatial models explicitly incorporate [9].

2.2. Spatial Consumer Behavior and Retail Location Choice

Understanding how consumers make spatial choices—where to shop, which store to visit, and how frequently—lies at the intersection of marketing, geography, and behavioral sciences. While classical location models (e.g., Reilly, Huff, and Christaller) provided the foundations for analyzing firms' locational strategies based on distance, size, and accessibility, contemporary research increasingly emphasizes the consumer as an active spatial decision-maker. Modern spatial interaction modelling shows that retail location choices are shaped not only by physical proximity but also by behavioral routines, trip purposes, digital shopping patterns, and contextual constraints [11].

The spatial behavior of consumers thus involves the ways individuals perceive, evaluate, and act upon the distribution of retail opportunities within the spaces they inhabit and traverse in their daily lives. This behavioral perspective recognizes that retail spatial choice cannot be reduced to distance minimization alone, but emerges from heterogeneous preferences, subjective perceptions of accessibility, and habitual mobility structures.

2.2.1. The Emergence of Spatial Behavior in Marketing Thought

A major shift in the study of spatial consumer decisions occurred with the rise in behavioral geography and behavioral modelling. Moving away from the assumptions of perfect rationality that characterized early spatial theories, behavioral approaches recognize that individuals operate under bounded rationality, cognitive limitations, and subjective perceptions of space [9]. Consumers' decisions are therefore shaped by incomplete information, habitual routines, and personalized evaluations of accessibility and attractiveness—not by objective distance alone.

In retailing, this behavioral turn opened the way for models that incorporate cognitive representations of space, perceived convenience, store image, and trip purpose as integral components of store choice. Contemporary studies show that consumers weigh multiple dimensions—including accessibility, perceived effort, digital shopping alternatives, and expected benefits—when selecting retail destinations [11]. This view frames spatial consumer behavior as a complex evaluative process influenced simultaneously by geographic constraints, behavioral tendencies, and psychological motivations.

2.2.2. Dimensions of Spatial Behavior: Distance, Accessibility, and Attractiveness

Among the variables governing spatial consumer decisions, distance and accessibility remain foundational. Distance, initially viewed as a physical measure of separation, has evolved into a perceived construct that incorporates travel time, effort, and psychological cost [12]. Accessibility, in contrast, captures the ease with which a retail location can be reached within an individual's activity network [13]. High accessibility reduces the friction of distance, thereby expanding the potential catchment area of a store.

Empirical studies show that accessibility interacts with consumer characteristics such as mobility, vehicle ownership, and time constraints [14,15]. In urban environments,

accessibility is particularly critical for proximity retailing, where store visits are frequent but spatially constrained [16]. For instance, small-format urban supermarkets thrive not merely due to their location but because they fit consumers' spatial routines and time budgets. This explains the resurgence of "proximity commerce" as a strategic retail format in dense cities [17].

The concept of store attractiveness complements accessibility by capturing the pull factors that motivate store choice. Attractiveness comprises both tangible attributes—such as product assortment, price competitiveness, service quality—and intangible elements such as ambience, trust, and brand image [5,8]. Spatial models that integrate attractiveness (e.g., Huff and MCI) assume that consumers trade off between accessibility and perceived benefits, leading to differentiated patronage patterns. A well-located store may fail if its image is weak, while a more distant one may attract consumers through superior perceived value.

2.2.3. The Role of Proximity in Retail Choice

The notion of proximity extends beyond physical distance to encompass relational, cognitive, and experiential closeness. Ref. [18] distinguished between geographical proximity (spatial closeness) and organizational, cognitive, or social proximity (shared meanings and relationships). In retailing, proximity translates into a sense of familiarity and habitual convenience—consumers often prefer stores embedded in their daily routes, even at the expense of objective distance efficiency [19].

Proximity refers to the spatial closeness between consumers' residential locations and retail outlets, often measured through store catchment areas or the distance to nearby supermarkets. This spatial proximity can influence neighborhood characteristics and consumer outcomes such as accessibility to food retail services [20].

Proximity-based preferences are reinforced by emotional attachment and identity factors [2]. For example, identity proximity—where the retail environment aligns with consumers' values and lifestyles—strengthens store loyalty. Similarly, relational proximity reflects the quality of interactions with staff and local embeddedness of the retailer, which foster trust and preference persistence [17]. These forms of proximity constitute intangible assets that reinforce attractiveness and shape spatial loyalty.

2.2.4. Spatial Decision Process and Cognitive Evaluation

Spatial consumer decision-making is inherently multi-criteria, involving a continuous process of perception, evaluation, and selection shaped by both personal and environmental constraints. Research in spatial cognition shows that consumers interpret retail environments through internally constructed spatial representations—mental schemas that integrate accessibility, distance, directional cues, and perceived attractiveness [21]. Contemporary geo-spatial studies confirm that these cognitive processes can be empirically modelled using GIS-based mobility traces, spatio-temporal activity patterns, and relational spatial structures capturing topological, directional, and distance-based relationships [11,22]. Such evidence demonstrates that consumers rely on cognitively salient spatial patterns, repeatedly favoring stores embedded within familiar activity paths even when objectively closer or cheaper alternatives exist. This behavioral regularity highlights the interaction between perceived accessibility and attractiveness within daily spatial routines, confirming that spatial choice is ultimately shaped by both cognitive evaluations and situational constraints [6].

2.2.5. Retail Location Choice and Urban Context

Retail location choice, from the consumer's perspective, is embedded within broader urban spatial structures. The urban environment both constrains and enables consumer

mobility, defining the range of feasible shopping destinations. As cities densify and mobility habits evolve, proximity-based consumption has regained importance, particularly as consumers seek to minimize travel time and integrate shopping activities into daily routines [23].

Urban retail transformation refers to the structural reconfiguration of urban commercial systems driven by the emergence of large-scale retail formats, the relocation of commercial activities toward suburban areas, and the reorganization of shopping practices associated with mass consumption. This transformation reshapes urban landscapes and modifies the spatial relationship between consumers and retail environments [24].

In urban retail environments, accessibility may also condition how strongly proximity influences consumers' perceptions of store attractiveness. When access conditions are favorable, the benefits of spatial proximity become more salient in consumers' evaluations of retail locations. Conversely, when access is constrained by mobility limitations or infrastructure barriers, the positive effect of proximity may weaken. Accessibility can therefore act as a contextual factor that moderates the relationship between proximity and perceived store attractiveness.

Neighborhood retailing refers to the presence of retail services embedded within residential areas that serve local populations and shape neighborhood accessibility to goods and services [20].

These dynamics suggest that accessibility may not only influence retail attractiveness directly but may also shape how proximity translates into consumers' evaluations of retail locations.

Classical approaches to retail geography traditionally emphasized physical accessibility as the main determinant of store attractiveness, assuming that consumers trade off travel distance against the utility derived from store features. More recent perspectives, however, show that spatial choice extends beyond objective distance to include perceived convenience, safety, and familiarity. As [21] argues, accessibility is not merely a physical property but a space–time and experience-dependent construct, shaped by individuals' daily routines and subjective evaluations of urban environments. This implies that consumers may favor locations embedded in their habitual activity paths, even when these are not objectively the nearest.

Empirical observations confirm that accessibility interacts closely with the morphology of urban space and with consumers' socio-spatial practices. In dense urban fabrics, local accessibility favors frequent and short shopping trips, while suburban consumers tend to rely on automobile mobility and make fewer but larger purchases. This differentiation reflects both infrastructural and behavioral constraints, demonstrating that retail location choice cannot be separated from the urban context in which it occurs [23].

Furthermore, studies on urban retail systems highlight that the configuration of shopping areas—central business districts, secondary centers, or neighborhood outlets—affects the spatial logic of consumption. Ref. [17] showed that high street vitality and accessibility are critical to sustaining proximity-based consumption and fostering loyalty to local stores. Their review of UK town centers demonstrates that the physical layout of retail services, pedestrian networks, and local identity collectively shape how consumers perceive convenience and organize their shopping behavior. This evidence supports the view that proximity and accessibility are not simply spatial measures but integral components of consumer experience and retail attractiveness.

In emerging urban environments, these dynamics are even more pronounced. Rapid population growth, informal mobility systems, and evolving urban infrastructures redefine consumers' spatial choices and their attachment to local stores. As [23] point out, geo-marketing approaches allow retailers to analyze these spatial interactions by integrating

socio-demographic data, mobility patterns, and geographic accessibility to better understand the territorial logics of consumption. This reinforces the notion that location choice in urban contexts results from both objective accessibility and perceived proximity, combining spatial rationality with behavioral and cultural factors.

Building on the preceding theoretical discussion, proximity is expected to shape consumers' evaluations of retail locations and influence their spatial decision-making. Specifically, proximity may enhance consumers' perceptions of store attractiveness and directly affect their choice of shopping destinations. In addition, accessibility conditions may influence how strongly proximity translates into perceived attractiveness in urban retail environments.

Hypothesis 1 (H1): *Proximity positively influences global attractiveness.*

Hypothesis 2 (H2): *Global attractiveness positively influences location choice.*

Hypothesis 3 (H3): *Proximity positively influences location choice.*

Hypothesis 4 (H4): *Accessibility moderates the relationship between proximity and global attractiveness.*

These relationships also suggest that store attractiveness may function as an intermediate mechanism through which spatial proximity influences consumers' retail location choices.

2.3. From Economic Geography to Geo-Marketing Applications

The integration of geography and marketing has progressively evolved from two distinct analytical traditions into an interdisciplinary field known as geo-marketing. Recent studies also emphasize that geo-marketing has become a strategic analytical framework that integrates spatial data analysis, consumer behaviour insights, and geographic information systems to support retail planning and territorial competitiveness [25].

Recent developments in geo-marketing highlight the growing role of spatial data analytics in understanding consumer mobility and purchasing behavior. By combining geographic information systems, real-time spatial data, and advanced analytics, retailers can map consumers' shopping routes, purchase locations, and mobility patterns to better understand spatial consumption dynamics [26].

While economic geography historically focused on spatial organization, resource allocation, and market accessibility, marketing research concentrated on consumer behavior and segmentation. The convergence of these domains emerged from the realization that spatial context fundamentally shapes consumption, competition, and retail performance [23].

2.3.1. From Spatial Economics to Territorial Marketing

The conceptual foundations of geo-marketing stem from the spatial economics of the early 20th century, where the distribution of activities was analyzed through the lens of cost minimization and market reach. However, as urban markets diversified, researchers recognized that economic models alone could not account for the diversity of consumer practices and the symbolic dimension of space. The development of territorial marketing in the 1980s and 1990s extended the economic perspective by acknowledging that spatial location also conveys value through image, identity, and relational capital [27].

In this view, territories became more than functional spaces—they turned into marketing entities capable of attracting both consumers and firms. The location of retail outlets, therefore, was no longer a mere technical decision based on accessibility, but a strategic

choice grounded in the symbolic and experiential representation of place. This evolution bridged the gap between geographic determinism and behavioral analysis, marking the transition from “space as a constraint” to “space as a resource” in retail management [19].

2.3.2. The Emergence of Geo-Marketing as a Decision-Support System

The evolution of retail decision-making has progressively integrated spatial data and analytical tools to support more informed site selection and market planning. According to [19], geo-marketing emerged as a bridge between geography and marketing, transforming spatial data into actionable intelligence for business strategies. This field builds upon earlier models of spatial interaction—such as the gravity model and the theory of central places—by incorporating digital mapping and big data to better capture consumer movements, purchasing behaviors, and territorial competition.

As noted by [27], geo-marketing offers decision-makers an operational cartographic framework that enables them to visualize, analyze, and forecast market dynamics. By combining socio-demographic, economic, and behavioral information, firms can identify high-potential areas, adjust distribution networks, and optimize promotional investments. These authors emphasize that geo-marketing goes beyond descriptive mapping: it is a true decision-support system, helping managers to anticipate market evolution and align their retail networks with urban transformations.

Furthermore, ref. [2] highlighted that spatial decision-making requires balancing quantitative models with managerial intuition. In this sense,—enhances rather than replaces human expertise, providing a structured approach to synthesize large volumes of localized information into strategic insights. The integration of geographic information systems (GIS) and spatial analytics thus contributes to more adaptive and consumer-centered location strategies.

Finally, geo-marketing has evolved from a tactical tool to a strategic asset, allowing firms to anticipate shifts in urban consumption patterns. This systemic view positions geo-marketing as a key component of sustainable retail planning, linking consumer accessibility, spatial equity, and territorial performance.

2.3.3. The Behavioral Dimension in Spatial Decision-Making

Retail location decisions are not solely technical or economic choices; they are strongly shaped by consumers’ behavioural patterns and subjective perceptions. Recent evidence shows that shoppers evaluate retail environments through a combination of perceived convenience, familiarity, and emotional comfort rather than purely rational trade-offs. As consumers navigate their routine activity spaces, they rely on habitual paths and place-based preferences that make certain locations feel more attractive or cognitively salient, even when alternative stores may be objectively closer or more efficient [7].

In this sense, spatial behavior theory extends classical location models by integrating psychological and perceptual dimensions. Ref. [19] argues that behavioral variables—such as mobility constraints, perceptions of accessibility, and store image—mediate the relationship between spatial proximity and shopping frequency. Consumers’ “felt proximity” often diverges from actual geographic distance, implying that perceived convenience, trust, and familiarity with the area significantly shape their mobility.

Moreover, ref. [5] highlights that shopping behavior depends not only on physical distance but also on perceived attractiveness, service quality, and the social experience associated with a location. Their findings show that urban consumers often choose retail areas that align with their identity and lifestyle, confirming that proximity is simultaneously functional, symbolic, and relational. Integrating such behavioral variables into

geo-marketing analyses helps refine demand forecasting and identify micro-territorial patterns of consumption.

From a managerial perspective, this behavioral approach allows retailers to segment catchment areas beyond simple demographics, considering factors such as time–space accessibility, shopping purpose, and emotional ties to neighborhoods. In doing so, firms can tailor their spatial strategies to specific consumer routines, optimizing both attractiveness and convenience.

2.4. From Spatial Analysis to Strategic Retail Planning

The shift from descriptive spatial analysis to strategic retail planning represents one of the most significant evolutions in geo-marketing. Initially, spatial models such as the gravity model or Huff's probabilistic model were used primarily to predict consumer flows. However, as retail environments have become more complex and competitive, location planning now integrates multidimensional criteria: mobility infrastructures, urban density, environmental constraints, and consumer lifestyles.

Ref. [27] underlines that modern geo-marketing is no longer limited to mapping catchment zones but serves as a genuine strategic management tool. It supports retail network optimization, performance monitoring, and market forecasting, allowing firms to visualize their competitive landscape dynamically. For example, GIS-based decision systems can simulate how opening or closing a store affects accessibility and territorial balance, which is particularly relevant for proximity formats and urban supermarkets.

According to [19], this evolution reflects the growing integration of spatial equity and sustainability principles into retail strategy. Urban planners and retailers alike now seek to balance accessibility with territorial cohesion, ensuring that commercial networks contribute positively to local development. This convergence between marketing and spatial planning supports what [2] describe as “strategic spatial thinking”, where geographic intelligence becomes central to retail performance.

Finally, geo-marketing's contribution to strategic planning lies in its capacity to combine empirical observation, behavioral insight, and predictive modeling. By merging spatial analytics with managerial judgment, firms can anticipate market shifts, enhance customer accessibility, and promote sustainable urban commerce. In this respect, geo-marketing emerges as a multidisciplinary field—anchored in geography, marketing, and behavioral science—that informs both academic research and applied retail management.

3. Research Methodology

3.1. Research Design and Context

This research adopts a quantitative, causal, and cross-sectional design aimed at testing the conceptual framework linking proximity dimensions, retail attractiveness, and location choice in the urban supermarket context of Tangier, Morocco. The city of Tangier provides a particularly relevant field for examining spatial consumer behavior due to its rapid urban expansion, diverse socio-economic composition, and increasing density of proximity-based retail formats.

Data were collected from consumers frequenting five major supermarket chains—Marjane Market, Carrefour Market, Carrefour Express, BIM, and Kazyon—which together represent the core of Tangier's modern retail structure. This study seeks to evaluate how perceived proximity (access, relational, identity, and process) affects store attractiveness and ultimately influences consumers' location choice, while considering the moderating role of perceived accessibility.

In this study, the term “supermarket” refers to self-service food retail outlets belonging to organized retail chains and offering a broad assortment of grocery and household

products in a fixed urban location. The definition used is operational rather than size-based, as the selected stores were identified according to their retail format, chain affiliation, and role in everyday urban food shopping in Tangier. This category excludes traditional markets, small independent grocery shops, and hypermarkets.

Partial Least Squares Structural Equation Modeling (PLS-SEM) was performed using SmartPLS (SmartPLS GmbH, Oststeinbek, Germany). This approach was selected because the study aims to analyze complex relationships between multiple latent constructs and to prioritize predictive explanation of consumers' retail location choices. PLS-SEM is particularly suitable for exploratory research models and for studies focusing on prediction and theory development in contexts where theoretical structures are still evolving [28,29]. Figure 1 presents the conceptual research model integrating all hypothesized relationships.

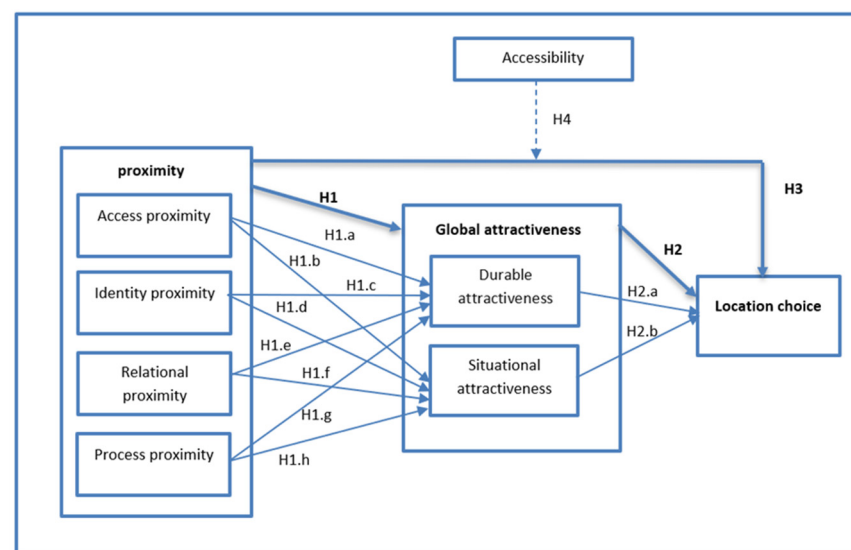


Figure 1. Conceptual Research Model.

3.2. Sampling and Data Collection Procedure

To strengthen the methodological rigor required for non-probability sampling designs, several procedures were implemented. Data was collected between November 2024 and January 2025 using a mixed approach combining in-store intercept surveys across five major supermarket chains and an online questionnaire disseminated through regional consumer networks. Although this sampling strategy is choice-based and purposive, multiple steps were adopted to enhance representativeness and minimize sampling bias.

First, stratification by store chain and urban zone ensured broad spatial coverage of Tangier's retail environment. Second, a pilot test ($n = 50$) confirmed measurement clarity and internal consistency prior to full-scale administration. Third, the final sample size ($N = 567$) substantially exceeds recommended thresholds for PLS-SEM. According to the widely used "10-times rule", the minimum sample size should be at least ten times the maximum number of structural paths directed at any latent construct in the model [28]. In the present model, the construct receiving the highest number of incoming paths is global attractiveness (four paths), implying a minimum requirement of 40 observations. The sample of 567 respondents therefore largely exceeds this threshold and ensures adequate statistical power for the estimation of the structural model.

Table 1 presents the demographic characteristics of the sample, including gender, age groups, household income brackets, transport mode, and supermarket visitation frequency.

Table 1. Sample characteristics.

Sample Characteristics		Frequency	Percentage
Gender	Man	202	35.6%
	Woman	365	64.4%
	Total	567	100.0%
Family status	Single	195	34.4%
	Married	308	54.3%
	Widowed	64	11.3%
	Total	567	100.0%
Age	Under 20 years old	9	1.59%
	20–24	176	31.04%
	25–29	153	26.98%
	30–40	161	28.39%
	41–50	54	9.52%
	More than 50	14	2.47%
	Total	567	100.0%
Monthly Household Income	10,001 DH–20,000 DH	21	3.7%
	2500 DH–5000 DH	281	49.6%
	5001 DH–7500 DH	184	32.5%
	7501 DH–10,000 DH	78	13.8%
	More than 20,000 DH	3	0.5%
	Total	567	100.0%
Type of vehicle owned	Two wheels	104	18.3%
	Not specified	336	59.3%
	Four wheels	127	22.4%
	Total	567	100.0%
Do you live in Tangier?	No	74	13.1%
	Yes	493	86.9%
	Total	567	100.0%
How often do you visit local supermarkets in the city of Tangier?	I never visit those stores	18	3.2%
	Less than once a month	70	12.3%
	Several times a week	254	44.8%
	Every day	67	11.8%
	Once a week	158	27.9%
	Total	567	100.0%

Furthermore, and to evaluate the representativeness of the sample, descriptive distributions of gender, age, and household income were compared with the Haut-Commissariat au Plan [30] indicators for the active urban population of Tangier. The sample profile was found to be broadly consistent with regional demographic patterns, which supports the contextual relevance of the data. In addition, data cleaning procedures, including the removal of incomplete responses and inconsistent answer patterns, were applied to improve the internal consistency and methodological rigor of the dataset.

Collectively, these methodological steps provide confidence that, despite relying on a non-probability sampling approach, this study yields reliable and generalizable insights into spatial consumer behavior within Tangier’s urban supermarket sector.

3.3. Measurement Model

3.3.1. Measurement Scales

All measurement items were adapted from established scales and contextualized to the Tangier retail environment. Each construct was operationalized using multiple items rated on a five-point Likert scale ranging from “strongly disagree” (1) to “strongly agree” (5).

- Proximity was conceptualized as a multidimensional construct comprising access proximity (Prox_acc1–4), identity proximity (Prox_id1–4), relational proximity (Prox_rel1–4), and process proximity (Prox_proc1–3), adapted from [31,32].
- Store attractiveness was measured through durable attractiveness (Attr_dur1–5) and situational attractiveness (Attr_sit1–5), derived from [5].
- Accessibility (Acc1–4) was measured following [33,34].
- Location choice (Loc1–4) reflected consumers’ intention and preference to shop in specific stores, adapted from [35].

The constructs were operationalized using previously validated measurement scales adapted to the retail context (see Table 2 for all items and variable codes). A preliminary pilot test (n = 50) confirmed item clarity and consistency.

Table 2. Measurement Items and Variable Codes.

Construct	Dimension	Items	Code
Proximity	Access Proximity	This supermarket is well located	Prox_acc1
		It is easy to access this supermarket.	Prox_acc2
		I can easily reach this supermarket.	Prox_acc3
		This supermarket is easily accessible by transport.	Prox_acc4
		This supermarket is on my daily commute.	Prox_acc5
	Identity Proximity	I fully agree with the values promoted by this supermarket.	Prox_iden1
		I completely share the vision of agriculture promoted in this store.	Prox_iden2
		The values of this store are very important to me.	Prox_iden3
		I share far more values with this store than with the other shops I go to.	Prox_iden4
		My personal values and those of this retail outlet are very similar.	Prox_iden5
	Relational Proximity	I have friendly relationships with the producers/sellers in this store.	Prox_relat1
		The producers/sellers in this store are very attentive to your expectations.	Prox_relat2
		I spend a lot of time exchanging information with producers/sellers about the products.	Prox_relat3
		I spend a lot of time talking with producers/sellers about topics other than those related to the products they sell.	Prox_relat4

Table 2. *Cont.*

Construct	Dimension	Items	Code
Proximity	Process Proximity	In this store I know exactly how my products are made.	Prox_proc1
		I have absolutely all the information I want about the origin of the products	Prox_proc2
		I am very familiar with the operating and organizational rules of this store.	Prox_proc3
		I am very familiar with the production methods used by the farmers who sell in this store.	Prox_proc4
		I know very well how the producers who sell in this store work.	Prox_proc5
	Durable Attractiveness	What is the likelihood that you will return to this supermarket in the future?	Attr_dur1
		What is the probability that you will come back here and buy something?	Attr_dur2
	Situational Attractiveness	You are willing to stay here as long as possible.	Attr_situ1
		You enjoy spending your time here.	Attr_situ2
Accessibility		I can get to that supermarket without any problems.	Access1
		There are always plenty of free parking spaces at this supermarket.	Access2
		There are several parking options available in sufficient quantity.	Access3
		This large store is easily accessible from the parking lots.	Access4
Location choice		This supermarket offers quality products.	Local_Qual1
		This supermarket offers fresh grocery products.	Local_Qual2
		This supermarket offers a good atmosphere in store.	Local_ambi1
		This staff is welcoming.	Local_ambi2
		This supermarket offers low prices.	Local_prix1
		This supermarket has good special offers.	Local_prix2
		This supermarket offers a wide selection of grocery products.	Local_assort1
		This supermarket frequently gets new products.	Local_assort2
		What is the typical travel time between your home and the supermarket you frequent most often?	Local_dista1
		What is the physical distance between your home and the supermarket you frequent most often?	Local_dista2

3.3.2. Reliability and Validity Assessment

The reliability and validity of the measurement model were evaluated prior to structural analysis. Internal consistency was confirmed through Cronbach's alpha (α) and Composite Reliability (CR) values exceeding 0.70 for all constructs [28,36]. Convergent

validity was established as all Average Variance Extracted (AVE) values that surpassed the 0.50 threshold [37].

Item loadings ranged between 0.71 and 0.89, indicating strong indicator reliability. Discriminant validity was verified using both the Fornell–Larcker criterion and inspection of cross-loadings, confirming that the square root of each construct’s AVE exceeded its inter-construct correlations [37,38].

Internal consistency and convergent validity were assessed through Cronbach’s alpha, Composite Reliability, and Average Variance Extracted (AVE) values. All constructs met acceptable thresholds, confirming measurement reliability (Table 3).

Table 3. Reliability and Validity Indices.

Construct	Dimension	Items	Factor Loadings ^a	Cronbach’s Alpha (α) ^a	Composite Reliability (CR) ^a	AVE ^b
Proximity	Access Proximity	Prox_acc1	0.843	0.861	0.900	0.643
		Prox_acc2	0.826			
		Prox_acc3	0.799			
		Prox_acc4	0.807			
		Prox_acc5	0.730			
	Identity Proximity	Prox_iden1	0.798	0.776	0.841	0.518
		Prox_iden2	0.650			
		Prox_iden3	0.851			
		Prox_iden4	0.634			
		Prox_iden5	0.611			
	Relational Proximity	Prox_rel1	−0.322	0.827	0.356	0.217
		Prox_rel2	0.233			
		Prox_rel3	0.463			
		Prox_rel4	0.646			
	Process Proximity	Prox_proc1	0.861	0.941	0.955	0.809
		Prox_proc2	0.896			
		Prox_proc3	0.929			
		Prox_proc4	0.914			
		Prox_proc5	0.895			
	Durable Attractiveness	Attr_dur1	0.868	0.594	0.830	0.710
		Attr_dur2	0.817			
	Situational Attractiveness	Attr_situ1	0.929	0.854	0.932	0.873
		Attr_situ2	0.939			
Accessibility		Access1	0.755	0.836	0.890	0.671
		Access2	0.874			
		Access3	0.827			
		Access4	0.814			

Table 3. Cont.

Construct	Dimension	Items	Factor Loadings ^a	Cronbach's Alpha (α) ^a	Composite Reliability (CR) ^a	AVE ^b
Location choice		Local_Qual1	0.772	0.812	0.862	0.500
		Local_Qual2	0.768			
		Local_ambi1	0.779			
		Local_ambi2	0.806			
		Local_prix1	0.775			
		Local_prix2	0.798			
		Local_assort1	0.784			
		Local_assort2	0.716			
		Local_dista1	−0.235			
		Local_dista2	−0.375			

^a The value must exceed 0.7. ^b The value must exceed 0.5.

Discriminant validity was evaluated using both the Fornell–Larcker criterion and cross-loadings analysis, confirming that each construct shared more variance with its own indicators than with others (Table 4).

Table 4. Fornell–Larcker Matrix and Cross-Loadings Table. (a). Fornell–Larcker Criterion. (b). Cross-Loadings Matrix.

(a)								
	Accessibility	Durable Attractiveness	Situational Attractiveness	Location Choice	Access Proximity	Process Proximity	Identity Proximity	Relational Proximity
Accessibility	0.849							
Durable attractiveness	0.214	0.843						
Situational Attractiveness	0.366	0.309	0.934					
Location choice	0.297	0.551	0.441	0.782				
Access Proximity	0.316	0.365	0.318	0.402	0.802			
Process Proximity	−0.250	−0.168	−0.223	−0.111	−0.135	0.899		
Identity Proximity	0.149	0.264	0.276	0.350	0.614	0.129	0.715	
Relational Proximity	−0.118	−0.104	−0.047	0.013	0.015	0.714	0.284	0.831
(b)								
	Accessibility	Durable attractiveness	Situational Attractiveness	Location choice	Access Proximity	Process Proximity	Identity Proximity	Relational Proximity
Access1	0.806	0.112	0.354	0.209	0.236	0.050	−0.282	−0.158
Access2	0.908	0.227	0.341	0.287	0.332	0.168	−0.268	−0.134
Access3	0.831	0.192	0.244	0.252	0.228	0.147	−0.095	−0.015
Attr_dur1	0.237	0.871	0.294	0.495	0.348	0.251	−0.155	−0.067
Attr_dur2	0.114	0.813	0.222	0.430	0.262	0.190	−0.126	−0.112
Attr_situ1	0.354	0.280	0.930	0.409	0.279	0.253	−0.183	−0.027
Attr_situ2	0.330	0.297	0.939	0.414	0.314	0.262	−0.233	−0.059

Table 4. *Cont.*

Local_Qual1	0.409	0.443	0.414	0.787	0.395	0.264	−0.189	−0.093
Local_Qual2	0.156	0.409	0.306	0.765	0.299	0.221	−0.145	−0.080
Local_ambi1	0.222	0.440	0.339	0.786	0.277	0.243	−0.071	0.023
Local_ambi2	0.263	0.482	0.385	0.818	0.359	0.291	−0.114	0.002
Local_assort1	0.236	0.438	0.355	0.787	0.324	0.284	−0.089	0.016
Local_assort2	0.113	0.353	0.266	0.717	0.268	0.268	−0.004	0.112
Local_prix1	0.223	0.450	0.356	0.785	0.251	0.333	−0.042	0.077
Local_prix2	0.176	0.412	0.304	0.806	0.324	0.283	−0.006	0.052
Prox_acc1	0.329	0.329	0.335	0.384	0.843	0.473	−0.206	−0.036
Prox_acc2	0.292	0.292	0.238	0.277	0.826	0.447	−0.212	−0.096
Prox_acc3	0.212	0.269	0.230	0.292	0.799	0.489	−0.020	0.083
Prox_acc4	0.234	0.324	0.246	0.319	0.807	0.510	−0.107	0.015
Prox_acc5	0.174	0.234	0.202	0.334	0.730	0.573	0.059	0.129
Prox_iden1	0.125	0.242	0.239	0.306	0.597	0.798	0.023	0.178
Prox_iden2	0.008	0.117	0.135	0.287	0.398	0.650	0.193	0.233
Prox_iden3	0.209	0.248	0.306	0.296	0.478	0.851	0.008	0.153
Prox_iden4	0.056	0.147	0.089	0.160	0.332	0.634	0.201	0.302
Prox_iden5	−0.003	0.109	0.067	0.143	0.303	0.611	0.299	0.356
Prox_proc1	−0.192	−0.144	−0.166	−0.082	−0.087	0.149	0.861	0.705
Prox_proc2	−0.271	−0.181	−0.211	−0.149	−0.133	0.102	0.896	0.663
Prox_proc3	−0.223	−0.152	−0.231	−0.111	−0.123	0.095	0.929	0.636
Prox_proc4	−0.221	−0.147	−0.202	−0.076	−0.128	0.105	0.914	0.616
Prox_proc5	−0.210	−0.127	−0.183	−0.068	−0.133	0.139	0.895	0.593
Prox_rel2	−0.085	−0.022	−0.005	−0.018	0.073	0.264	0.533	0.632
Prox_rel3	−0.090	−0.072	−0.012	0.056	0.046	0.284	0.612	0.872
Prox_rel4	−0.117	−0.116	−0.064	−0.007	−0.014	0.238	0.673	0.955

3.3.3. Statistical Assumptions and Bias Diagnostics

Multicollinearity

Variance Inflation Factors (VIFs) were computed for all reflective indicators to assess item-level and construct-level collinearity. As shown in Table 5 (Internal VIFs), internal VIF values range between 1.170 and 2.589, remaining well below the recommended threshold of 5.0 [28]. Similarly, Table 6 (External VIFs) reports indicator-level VIFs that also fall within acceptable limits. These results confirm the absence of harmful multicollinearity among both latent constructs and their associated items.

Table 5. Internal VIFs values (Construct level—multicollinearity).

Construct	Accessibility	Durable Attractiveness	Situational Attractiveness	Location Choice
Accessibility				1.170
Durable attractiveness				1.121
Situational attractiveness				1.234
Location choice				
Access proximity		1.737	1.737	
Process proximity		2.132	2.132	
Identity proximity		1.830	1.830	
Relational proximity		2.209	2.209	

Table 6. External VIFs values (Indicator level—multicollinearity).

Construct	VIF	Construct	VIF
Access1	1.747	Prox_acc4	1.863
Access2	2.223	Prox_acc5	1.636
Access3	1.663	Prox_iden1	1.526
Attr_dur1	1.217	Prox_iden2	1.366
Attr_dur2	1.217	Prox_iden3	1.648
Attr_situ1	2.253	Prox_iden4	1.496
Attr_situ2	2.253	Prox_iden5	1.533
Local_Qual1	2.050	Prox_proc1	2.778
Local_Qual2	2.003	Prox_proc2	3.220
Local_ambi1	2.042	Prox_proc3	4.398
Local_ambi2	2.269	Prox_proc4	4.350
Local_assort1	2.046	Prox_proc5	3.962
Local_assort2	1.770	Prox_rel2	1.513
Local_prix1	2.057	Prox_rel3	2.260
Local_prix2	2.321	Prox_rel4	2.028
Prox_acc2	2.093	Prox_acc1	2.021
Prox_acc3	1.933		

Common Method Bias (CMB)

Harman's single-factor test was conducted to evaluate the presence of common method variance. As reported in Table 7 (Total Variance Explained), the first unrotated factor accounts for 29.826% of the total variance—significantly below the 50% threshold suggested by [39]. This indicates that common method bias does not pose a threat to the validity of the measurement model.

Table 7. Harman's Single-Factor Test for Common Method Bias.

Component	Initial Eigenvalues (Total)	% of Variance	Cumulative %	Extraction Sums of Squared Loadings (Total)	% of Variance After Extraction	Cumulative % After Extraction
1	3.461	69.225	69.225	3.461	69.225	69.225
2	0.523	10.463	79.688			
3	0.406	8.119	87.808			
4	0.356	7.124	94.932			
5	0.253	5.068	100.000			

Note. The first factor explains 69.225%, which is below the 50% threshold, indicating no serious common method bias.

Endogeneity Assessment

Potential endogeneity among relational constructs was examined using recommended diagnostics for PLS-SEM [40]. Residual-based checks showed no instability in path estimates, and no significant evidence of endogeneity was detected. These results support the reliability of the causal interpretations in the structural model.

3.4. Structural Model Assessment

3.4.1. Path Coefficients and Hypothesis Testing

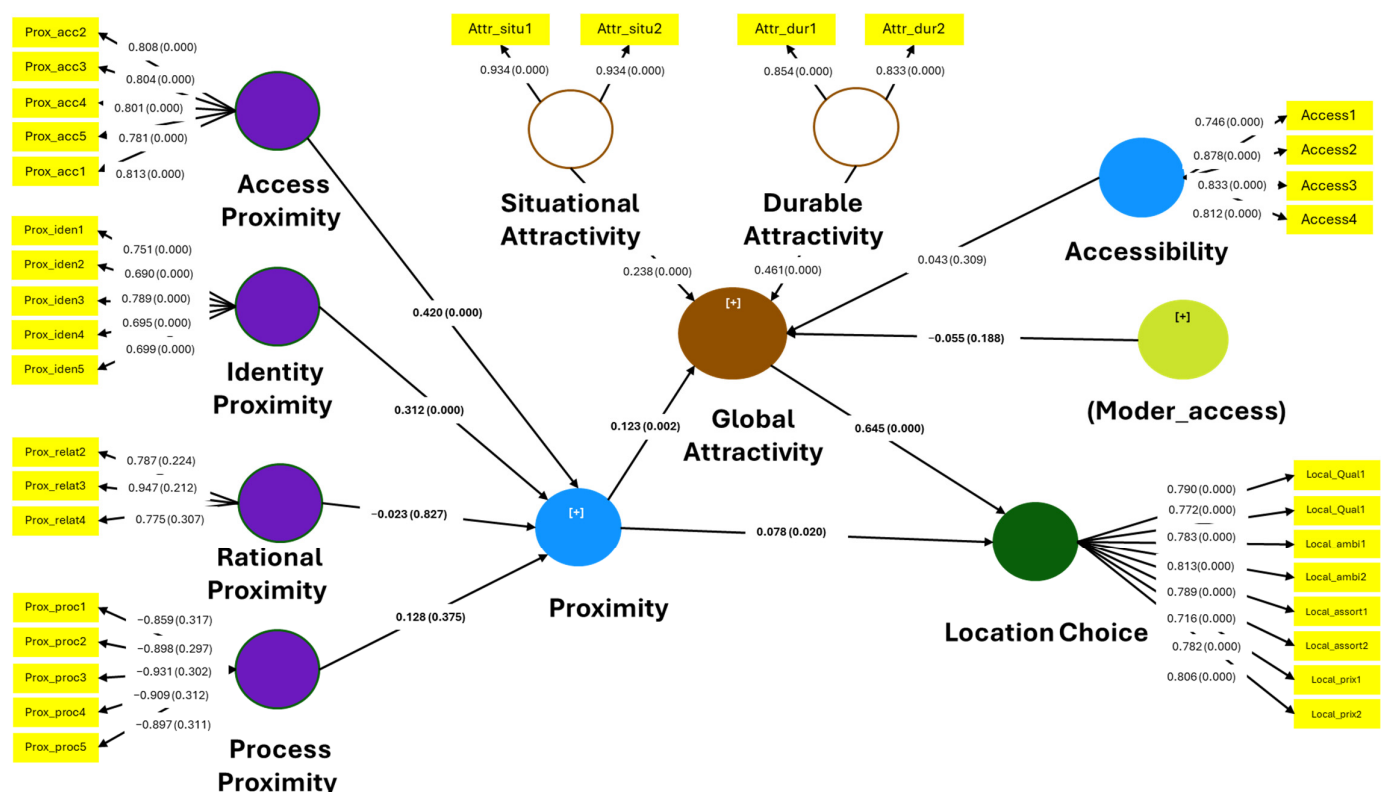
Following validation of the measurement model, the structural model was estimated using the bootstrapping technique with 5000 resamples to test the significance of path coefficients [28]. Results show that proximity exerts a significant positive effect on both durable and situational attractiveness ($\beta = 0.123, p < 0.05$), which in turn strongly predicts consumers' location choice ($\beta = 0.645, p < 0.001$). Path coefficients, *t*-values, and *p*-values are summarized in Table 8.

Table 8. Structural Path Coefficients and Bootstrapping Results.

Hypo	Relation	Std. Beta (β)	Std. Dev	t-Value	p-Value	Decision
H1	Proximity -> Global Attractiveness	0.123	0.040	3.051	0.002	Accepted
H1.a	Access proximity -> durable attractiveness	0.274	0.059	4.610	0.000	Accepted
H1.b	Access proximity -> situational attractiveness	0.163	0.059	2.784	0.005	Accepted
H1.c	Identity proximity -> Durable attractiveness	0.130	0.062	2.088	0.037	Accepted
H1.d	Identity proximity -> situational attractiveness	0.181	0.063	2.897	0.004	Accepted
H1.e	Relational proximity -> durable attractiveness	−0.080	0.056	1.422	0.155	Rejected
H1.f	Relational proximity -> situational attractiveness	0.121	0.060	2.029	0.043	Accepted
H1.g	Process proximity -> Durable attractiveness	−0.091	0.051	1.778	0.076	Rejected
H1.h	Process proximity -> situational attractiveness	−0.311	0.053	5.852	0.000	Accepted
H2	Global attractiveness -> Location choice	0.645	0.037	17.246	0.000	Accepted
H2.a	Durable attractiveness -> Location choice	0.447	0.035	12.633	0.000	Accepted
H2.b	Situational attractiveness -> Location choice	0.264	0.037	7.119	0.000	Accepted
H3	Proximity -> Location choice	0.078	0.034	2.336	0.020	Accepted
H4	Accessibility moderation Proximity-> Global attractiveness	−0.055	0.041	1.317	0.188	Rejected

However, the moderating effect of accessibility on the relationship between proximity and attractiveness was not statistically significant ($\beta = 0.041$, $p > 0.05$). These findings partially support the proposed hypotheses (H1–H3 accepted; H4 rejected).

The structural model is depicted in Figure 2, which displays the path coefficients and significance levels for each hypothesized relationship

**Figure 2.** SmartPLS Structural Model Diagram.

3.4.2. Predictive Relevance and Model Fit

Model quality was further assessed through R^2 , Q^2 , and Goodness-of-Fit (GoF) indices. The model explains 41.5% of the variance in attractiveness and 45.0% in location choice, indicating substantial explanatory power [29]. Predictive relevance was confirmed with Q^2 values of 0.204 and 0.254, both above the recommended 0.20 threshold [28].

The overall Goodness-of-Fit (GoF) value of 0.547 [41] demonstrates an excellent model fit. No multicollinearity issues were detected ($VIF < 3$), and all standardized residuals remained within acceptable limits.

These results collectively validate the robustness and predictive capability of the proposed model in explaining spatial consumer behavior within an emerging urban retail context (Table 9).

Table 9. Model Quality Indices (R^2 , Q^2 , GoF).

Construct	Coefficient of Determination ^a (R^2)	Predictive Relevance ^c (Q^2)	Model Fit Quality ^b (GoF)
Global Attractiveness	0.415	0.204	0.547
Location choice	0.450	0.254	

^a The value must be ≥ 0.19 . ^c: The value must be > 0 . ^b The value must be ≥ 0.1 .

4. Results and Discussion

4.1. Structural Model Results

After validating the measurement model, the structural relationships were examined using Partial Least Squares Structural Equation Modelling (PLS-SEM) in SmartPLS 4. The results demonstrate that the proposed model explains a substantial proportion of the variance in the endogenous constructs: $R^2 = 0.415$ for attractiveness and $R^2 = 0.450$ for location choice, indicating satisfactory explanatory power [28,29].

While relational proximity and process proximity demonstrate satisfactory internal consistency in the measurement model, their structural relationships with global attractiveness are not statistically significant. This suggests that although the items consistently capture the underlying constructs, these dimensions do not exert a strong direct influence on consumers' perceptions of store attractiveness in the studied context. This finding indicates that functional accessibility and identity-related proximity may play a more decisive role in shaping attractiveness perceptions in urban supermarket environments.

In turn, store attractiveness strongly predicts location choice ($\beta = 0.645$, $p < 0.001$), validating H2. This finding aligns with the view that store selection is primarily guided by perceived attractiveness rather than objective distance or accessibility [2,5].

The direct effect of proximity on location choice (H3) was also positive and significant ($\beta = 0.078$, $p < 0.05$), suggesting that consumers' spatial decisions are influenced both directly by perceived spatial proximity and indirectly through their evaluations of store attractiveness.

However, the moderating effect of accessibility (H4) on the proximity–attractiveness relationship was not statistically significant ($\beta = 0.041$, $p > 0.05$). This result implies that accessibility, as perceived by consumers, does not amplify or weaken the role of proximity in shaping store attractiveness.

Overall, these structural results highlight the central role of perceived store attractiveness as the key mechanism linking spatial proximity to consumers' retail location choices in urban supermarket environments.

4.2. Discussion of Findings

The results confirm the central premise that proximity plays a decisive role in shaping consumers' perceptions of retail attractiveness and their eventual store choice. This supports prior work suggesting that spatial proximity is not only a functional driver (reducing travel time and effort) but also a psychological determinant of retail loyalty [5,19].

These results should also be interpreted within the specific urban context of Tangier, which is characterized by rapid urban expansion, increasing population density, and the spatial diffusion of modern supermarket chains across residential areas. These territorial dynamics shape consumers' daily mobility patterns and reinforce the importance of spatial proximity in retail location decisions.

Beyond confirming existing theoretical relationships, this study contributes new empirical evidence from an emerging urban context. By examining multiple dimensions of proximity simultaneously, the findings highlight how spatial, relational, and identity-related factors interact in shaping consumers' retail location decisions in rapidly urbanizing environments.

The positive relationship between proximity and attractiveness aligns with theories of spatial behavior, where physical closeness fosters familiarity, trust, and routine shopping patterns [8,42]. In Tangier, where urban density and socio-economic diversity coexist, this relationship is further reinforced by the cultural preference for neighborhood-based shopping. Consumers value retailers that are embedded within their daily mobility networks, reflecting what [18] describe as the "proximity effect of everyday life".

The strong impact of attractiveness on location choice also corroborates the findings of [43], who emphasized that perceived store attractiveness—beyond simple accessibility—constitutes the primary predictor of patronage intention. In the context of Tangier, this means that consumers evaluate retail outlets not only by convenience but also by symbolic and relational aspects such as perceived quality, familiarity, and community attachment.

The significant direct path from proximity to location choice ($\beta = 0.078$) highlights a distinctive behavioral pattern in emerging urban contexts. Even after controlling for attractiveness, proximity remains an independent predictor of consumer spatial decisions. This finding is consistent with behavioral geography literature, which emphasizes habitual and boundedly rational shopping behavior [19,44]. These findings are consistent with previous empirical research on spatial consumer behavior, which highlights the role of proximity and accessibility in shaping retail patronage decisions in urban environments.

In dense urban environments such as Tangier, consumers often rely on spatial routines—visiting nearby stores even when more attractive alternatives exist—because the perceived cognitive and temporal costs of exploring other options are high.

Conversely, the non-significant moderating role of accessibility suggests that perceived accessibility may already be internalized within consumers' broader notion of proximity. In the case of Tangier, most urban supermarkets are in well-connected areas, reducing perceived variability in accessibility across locations. This homogeneity likely explains the absence of moderation. Similar findings have been reported by [2], who observed that accessibility plays a less distinctive role in mature or saturated retail systems where distance barriers are minimal.

Collectively, these results confirm that proximity and attractiveness are interdependent yet distinct constructs in shaping consumer spatial behavior. Proximity provides the spatial and relational foundation upon which attractiveness operates, while attractiveness transforms spatial closeness into consumer preference and loyalty.

4.3. Theoretical and Managerial Implications

4.3.1. Theoretical Implications

This research contributes to the literature by empirically validating a multidimensional model of proximity and integrating it within a spatial consumer behavior framework. It extends classical models of retail gravitation [8,45] by showing that consumers' location choices are not solely determined by physical distance but also by relational, cognitive, and symbolic dimensions of proximity.

The findings further enhance geo-marketing theory [23,27] by demonstrating how spatial and behavioral factors can be jointly modelled through PLS-SEM. The results confirm that the interplay between proximity and attractiveness forms a behavioral mechanism underlying store patronage, bridging the gap between geographic and marketing perspectives.

4.3.2. Managerial Implications

From a managerial standpoint, the study underscores the importance of strategic proximity management.

1. Retailers operating in dense urban markets like Tangier should leverage proximity not only through location decisions but also through relational and experiential strategies that reinforce perceived closeness.
2. Local identity and community anchoring—Stores can strengthen identity proximity by aligning with neighborhood culture, supporting local events, or using location-specific communication.
3. Service and interaction quality—Enhancing relational proximity through friendly staff, trust-based relationships, and personalized service fosters long-term loyalty even in highly competitive areas.
4. Operational convenience—Maintaining consistency in stock availability, opening hours, and micro-accessibility (parking, pedestrian access) can enhance perceived process proximity.
5. Urban planners and local policy makers can also use geo-marketing insights to support balanced retail distribution across urban neighborhoods. Understanding how proximity and accessibility influence consumer behavior can inform zoning policies, transport planning, and the spatial allocation of commercial infrastructure in rapidly growing cities.

In addition, retailers can use geo-marketing tools (GIS, heat maps, catchment segmentation) to identify underserved micro-areas and optimize their proximity strategies. By understanding spatial consumption routines, retailers can reposition stores or adjust assortments to maximize both attractiveness and perceived closeness.

5. Conclusions and Contributions

5.1. Theoretical Contributions

This study contributes to the growing body of research on spatial consumer behavior and urban retail geography by integrating the concept of proximity into a multidimensional model of store attractiveness and location choice. Building on the work of [2,5], this research provides an empirically validated framework showing how different proximity dimensions—access, identity, relational, and processual—influence consumers' perception of retail attractiveness and their location choices.

The results demonstrate that proximity is not a homogeneous concept but a composite of functional and symbolic ties between consumers and retail spaces. Consistent with the multidimensional view of attractiveness proposed by [5], the findings show that proximity

of access and proximity of identity significantly enhance both situational and durable attractiveness. These dimensions represent, respectively, the physical accessibility of stores and the psychological identification consumers develop with specific supermarket brands or locations.

Conversely, relational proximity and process proximity—which relate to interaction quality and knowledge of internal processes—show weaker or even negative effects, suggesting that routine familiarity may reduce novelty and perceived experiential value. This adds nuance to prior models of spatial decision-making, which often treated proximity as a unidimensional spatial variable [8,45] and aligns with more recent calls to include relational and affective aspects of geographic behavior [19].

The study also confirms the mediating role of store attractiveness between proximity and location choice, with attractiveness explaining a substantial proportion of the variance in consumers' locational preferences ($R^2 = 0.45$). This supports the theoretical proposition that perceived attractiveness acts as a behavioral bridge between geographic context and store choice [2,5].

5.2. Managerial Contributions

From a managerial perspective, the findings offer strategic insights for urban supermarket operators competing in dense markets such as Tangier. First, the results highlight that investing in accessibility and neighborhood integration enhances perceived convenience and strengthens durable attractiveness. Retailers like Marjane Market or Carrefour Market, which position themselves close to residential areas and transport hubs, can leverage this advantage through targeted communication emphasizing time savings and urban embeddedness.

Second, the influence of identity-based proximity suggests that retailers should cultivate symbolic proximity—for instance by promoting local sourcing, cultural resonance, and brand authenticity. These factors reinforce emotional attachment and loyalty, particularly in urban contexts where functional differentiation is minimal.

Third, the relatively weak or negative impact of relational and process proximity signals that consumers may not always value over-familiarity with retail staff or operational transparency. Managers should therefore balance efficiency and novelty, ensuring that routine interactions do not undermine the experiential appeal of shopping.

5.3. Methodological and Contextual Contributions

Methodologically, this study extends spatial consumer behavior modelling by employing Partial Least Squares Structural Equation Modelling (PLS-SEM) to analyze proximity's multidimensional effects. This approach allows for robust estimation under non-normal data distribution and exploratory conditions [28]. It demonstrates the applicability of PLS-SEM in urban retail geography research, where behavioral constructs are interrelated and context-dependent.

Contextually, the study provides rare empirical evidence from Tangier (Morocco)—a rapidly growing North African metropolis—where urban densification, cultural diversity, and mobility constraints shape proximity consumption. The findings contribute to cross-regional comparative research, filling a gap in the literature that remains heavily dominated by European and North American studies [17].

5.4. Limitations and Future Research Directions

Although the findings provide strong empirical support for the proposed model, several limitations should be acknowledged. In line with spatial modelling studies such as [4], future research could integrate GIS-derived accessibility measures or spatial clustering indicators to complement perceptual proximity dimensions. First, this study is limited

to a single urban area (Tangier), which may restrict generalizability to other Moroccan or international contexts. Comparative studies across multiple cities could provide deeper insights into how urban form and retail density influence proximity effects.

Second, the cross-sectional design prevents causal inference over time. Future research could adopt a longitudinal approach to capture changes in spatial behavior, especially in response to urban development or digitalization.

Third, this study did not explicitly account for competitive proximity—that is, the spatial interplay between different retail chains. Integrating competition indices or spatial autocorrelation measures would further enrich the geo-marketing model.

Finally, future studies could incorporate objective spatial data (e.g., GPS tracking or GIS mobility mapping) alongside survey-based perceptions to provide a more comprehensive understanding of spatial decision-making in retail settings.

Author Contributions: Conceptualization, N.B.A.; methodology, M.B.; software, N.B.A.; validation, M.B.; formal analysis, N.B.A.; investigation, N.B.A.; resources, N.B.A.; data curation, N.B.A.; writing—original draft preparation, N.B.A.; writing—review and editing, M.B.; visualization, M.B.; supervision, M.B.; project administration, N.B.A. and M.B.; funding acquisition, N.B.A. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: Ethical review and approval were waived for this study due to reason that the study does not fall within the scope of authorization procedures defined by Law No. 09-08 (<https://www.cndp.ma/loi-09-08/> accessed on 23 March 2026).

Informed Consent Statement: Informed consent was obtained from all subjects involved in the study.

Data Availability Statement: The original contributions presented in this study are included in the article. Further inquiries can be directed to the corresponding author.

Conflicts of Interest: The authors declare no conflict of interest.

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