Impact of Store Lighting on Purchase Decisions Among Younger Mongolian Consumers

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Abstract

This research aims to investigate how store lighting influences purchasing decisions among Mongolian consumers, using the Theory of Reasoned Action (TRA) as the theoretical framework. The study focuses on factors such as store lighting, purchase intention, and consumer decision-making. A survey was conducted among customers of nine major chain stores in Ulaanbaatar city of Mongolia to explore the relationship between store light and consumer purchase decisions. A sample of 412 customers of the 18-34 age group was selected and surveyed. The study reveals that store environment lighting significantly impacts purchasing decisions through its effect on the customer's intention to purchase. Store light in different variations directly influences purchasing decisions, highlighting its importance in shaping consumer behavior. The research demonstrates that effective management of store lighting can enhance consumers' desire to purchase and positively impact their decision-making process. These findings are valuable for improving store lighting and further research into the store environment.

Keywords: Store lighting, TRA design, Purchase intentions, Decision behavior, Demographic factors.

Introduction

The retail environment has long been recognized as a significant factor influencing consumer behavior, particularly through the use of atmospheric elements such as lighting, layout, and color. Prior studies have explored various dimensions of store atmospherics, emphasizing the critical role lighting plays in shaping customer perceptions and purchasing intentions. For instance, He et al. (2022) demonstrated that different LED lighting environments significantly impact consumers' evaluations of clothing, highlighting that the choice of lighting can enhance or diminish the overall shopping experience. Their findings suggest that lighting not only affects the aesthetic appeal of products but also influences customers' desire to purchase, underscoring the necessity for retailers to carefully consider their lighting strategies. Koernig (2003) expands the discussion of the physical environment's influence on consumer attitudes by introducing the concept of "e-scapes," where the online shopping experience parallels in-store atmospherics. This

research underscores the importance of tangible cues, such as lighting, in shaping consumers' perceptions of service quality, loyalty, and overall satisfaction. In a similar vein, Ndengane, Mason, and Mutize (2021) found that various atmospheric factors, including lighting, directly correlate with customer satisfaction in South African retail outlets, emphasizing the need for retailers to cultivate an engaging shopping atmosphere. Research by Pathak, Rajagopal, and Mahajan (2021) further solidifies the link between store lighting and consumer behavior, particularly in the Indian retail context. Their findings indicate that lighting significantly impacts consumers' perceptions of brands and their overall shopping experience. The importance of these insights becomes apparent when considering the increasingly competitive landscape of retail, where enhancing customer experience is paramount for brand loyalty. The relationship between impulsive buying behavior and store environment, particularly lighting, has also been a focal point in the literature. Hussain and Siddiqui (2019) found that while impulsive buyers may not be significantly influenced by store atmospherics, elements such as lighting and cleanliness still play a role in stimulating impulse purchases. Similarly, Angula and Zulu (2021) highlighted the need for brick-and-mortar retailers to innovate their store atmospherics, including lighting, to compete effectively with online shopping. In addition to impulsive buying, the emotional impact of store lighting has been examined by various researchers. Sun et al. (2019) explored how LED lighting affects the atmosphere and emotional responses of consumers in apparel stores, concluding that higher brightness levels contribute to a livelier shopping environment. This finding aligns with Biswas et al. (2017), who demonstrated that ambient lighting influences food choices in restaurants, indicating that lighting can significantly shape consumer behavior across different retail settings. Despite the wealth of literature examining store atmospherics and lighting, gaps remain, particularly concerning younger consumers in specific cultural contexts. As retail dynamics continue to evolve, understanding how store lighting affects consumer behavior is crucial for retailers aiming to optimize their environments and enhance shopping experiences. This study seeks to address these gaps by investigating the effects of store lighting on purchasing decisions among younger consumers in Ulaanbaatar, Mongolia, utilizing the Theory of Reasoned Action as a foundational framework. By doing so, it aims to contribute to the existing body of knowledge while providing practical insights for retailers in the region.

The globalization of society and technology, coupled with rapid technological advancements, has significantly altered the purchase decision-making process in retail trade. In contemporary society, consumers increasingly engage in shopping to alleviate time-related pressures and stress (North & Croeser, 2006; Jacoby, 2002). It is crucial to examine consumers' perspectives (Evans, 2010) and to understand the factors influencing their purchasing decisions (Cant & Hefer, 2012). Many scholars have conducted studies in this area; however, it is essential to examine in detail the factors of the store environment specific to this particular segment. Currently, 49.6 percent of all domestic retail trade organizations are newly established enterprises, while 491 (48.5 percent) of joint ventures involving foreign nationals are engaged in trade. Large national chain stores in Mongolia, which hold a leading position in the retail sector, attend to the store environment. However, due to their inability to fully address environmental issues, they have left certain gaps. For instance, E-Mart operates four branches, while Premium Nexus JSC, also known as CU, operates 374 branch stores and reported a net profit of 390 billion. From this perspective, the significance of the retail sector to both Mongolian society and the economy becomes apparent. Additionally, the activities of Mongolian national retail organizations are unstable, while the growth of foreign franchise stores in the retail sector is accelerating rapidly. Based on the above observations, it is noted that the product selection in these franchise stores closely mirrors that of Mongolian stores, with 95 percent of local products being supplied. Despite the limited variety, the adherence to uniform standards in in-store environments has influenced Mongolian consumers to prefer foreign franchise stores over domestic ones. Consequently, if the store environment is a significant factor, it is essential to investigate how environmental variables impact consumer decision-making.

In this study, we examine store lighting as one of the variables in the store environment. This focus is justified by the fact that 90% of all cues in a retail store environment are visual (Kerfoot, Davies, & Ward, 2003). The significance of visual elements, including lighting, in a store environment is substantial. Despite the potential benefits of retail store lighting, there is limited understanding of how specific lighting decisions influence shoppers' in-store behavior (Quartier, Vanrie, & Van Cleempoel, 2014). Although there is a substantial body of research on consumer behavior conducted by academics in our country, the impact of store environment factors, particularly store lighting, has not been thoroughly investigated. Currently, there is no model or research specifically focused on Mongolian consumers. Consequently, shopkeepers rely on external sources for improvement due to a lack of knowledge and experience regarding how Mongolian consumers are affected and how to adapt and organize store environments accordingly. As a result, there is no clear understanding of the outcomes associated with these practices. Given the evolving consumer preferences shaped by societal and cultural changes, this study aims to assess how store lighting—an integral aspect of the store environment—affects the purchasing decisions of Mongolian consumers. Understanding this impact is crucial for enhancing the competitiveness of national stores, which play a significant role in Mongolia's social economy, and for advancing the quality of trade services.

Literature review

Consumer purchase decision-making has been defined in various ways by scholars. Solomon (2007) provides a broad overview, while Kotler (2000) focuses on specific aspects such as purchase frequency, overall satisfaction, and purchase interest. Additionally, decision-making encompasses product selection, brand selection, dealer selection, purchase quantity, and the timing of the purchase. Given these definitions, this study aims to assess how store lighting—a crucial element of the store environment—affects the purchasing decisions of Mongolian consumers. Understanding this impact is essential for elevating the standards of trade services. For Mongolian consumers, the decision-making process after entering a store involves selecting the most suitable option from a series of choices made to satisfy their needs before making a purchase. Each purchase decision comprises four components: purchase quantity, overall satisfaction, the timing of the purchase, and the amount of money spent (Kotler, 2000; Solomon, 2007; Kotler & Keller, 2009). Hellier et al. (2003) define purchase intention as a consumer's decision to buy a specific service again, considering situational factors and preference levels. In contrast, Shamsher (2016) explains that purchase intention refers to the consumer's ability and willingness to purchase a specific product or service again. Consumer purchasing decisions are influenced by a variety of factors, including the 7Ps of marketing, service quality, satisfaction, attitudes, and environmental factors. This study will specifically examine how lighting, as an environmental factor, affects consumer purchasing decisions. Intelligent lighting solutions, as a visual element, play a crucial role in enhancing the attractiveness of the store environment and the products and services offered. Many experts assert that one of the primary functions of store lighting is to capture and hold customers' attention (Karlen & Benya, 2011).

Kotler (1973) highlighted the significance of the store environment as a key marketing tool and defined "atmosphere" as the deliberate design of a space intended to positively influence customers' emotions and increase the likelihood of purchase. Wang and Ha (2011) further characterized the store environment by various environmental factors, including music, lighting, store layout, and merchandise arrangement. Some researchers have examined store environment factors by categorizing them into aspects such as store exterior, general interior, layout, design, point of purchase, and decoration indicators. In addition to these factors, Turley and Milliman have further expanded the classification by including five types of human variables. Kotler (1973, 2001), Marquardt, Mackens, and Roe (1983), Kerfoot, Davies, and Ward (2003), Ballantine, Jack, and Parsons (2010), and Kang et al. (2011) have classified store environment factors based on the four senses: sight, hearing, smell, and touch. In contrast, Zentes et al. (2007) expanded this classification to include five senses. Additionally, Levy and Weitz (2001), Berman and Evans

(2013), and Soars (2009) have specifically studied the sense of sight concerning the store environment. Berman and Evans (2001) classified environmental factors into tangible and intangible categories. Baker (1986) further divided these factors into three categories: perceptible environmental factors, design factors, and social factors. Additionally, Gobe (2009) focused on visual perception, categorizing it into various visual elements such as color, lighting, shadow, and shape. The main scholars who have studied lighting and its effects include Kotler (1973), Donovan et all., (1994), Baker (1986), Bitner (1992), Arena Kim (1994), Baker, Grewal, and Parasuraman (1994), Turley and Milliman (2000), Hoffman and Turley (2002), Pegler (2012), Berman and Evans (2018) and Levy and Grewal (2023).

Lighting is employed to highlight or enhance the visibility of products. As defined in dictionary[1] lighting as the equipment that enables visibility. Levy and Grewal (2023) emphasize that effective store lighting is more crucial than merely illuminating the space. Consequently, retailers need to understand and utilize lighting effectively to enhance the store environment. Lighting affects the mood of consumers and the retail atmosphere, increases the retail space, and allows customers to navigate more easily. Nowadays, almost all stores are equipped with basic lighting, and accent lighting is often found in large stores. When properly lit, a product can influence a consumer's purchase, highlighting merchandise and directing consumers' attention from one feature to another, not only entering the store but also through the store (Pegler, 2012). When the lighting in a retail store features effective color schemes, customers are more likely to touch the products to assess their quality (Areni & Kim, 1994). Some researchers suggest that additional or brighter lighting can encourage shoppers to approach products more frequently, handle more items, and spend more time in the store or at a particular display (Areni, 1994; Summers, 2001). If the customer has a positive perception of the store, they are willing to spend more time in the store (Berman, 2018), and lighting plays an important role in this, effective store lighting increases the interest of customers to purchase, creates convenience, and reduces shopping hassles and anxiety (Mohan and Sharma, 2013). Ariffin (2012) found that lighting influences recommendations and repeat visits among younger customers in a study of restaurant atmosphere. With age, users become less sensitive to light and have less ability to distinguish, older people cannot see well in low light or at night; compared to younger generations, they have been found to take longer to adapt to a dark environment, i.e., more time to transition from outside light to inside (Oweley, 2016, Moschis 1987). Some studies have highlighted that women are generally more visually oriented than men, often enjoying the process of browsing, comparing, and selecting from various stimuli. In contrast, men tend to be more decisive and quickly and efficiently complete purchases (Hart, 2007).

Additionally, the influence of store lighting on consumer behavior has garnered considerable attention in recent years, particularly as retailers seek to enhance the shopping experience and drive purchasing decisions. Several studies have highlighted the significant role of lighting in shaping consumer perceptions and behaviors in retail environments. He et al. (2022) examined the effects of various LED lighting environments on consumer behavior in clothing stores. Their research established that lighting could affect the perceived atmosphere and color fidelity of clothing, ultimately influencing consumer preferences and purchasing intentions. The findings indicated that different lighting methods, particularly mixed lighting, were more effective in enhancing the attractiveness of specific clothing colors, thereby supporting the idea that lighting conditions significantly impact consumer evaluations. Similarly, Koernig (2003) discussed the concept of "e-scapes," suggesting that the physical environment, including lighting, is crucial in shaping consumer attitudes in both physical and online retail settings. The study emphasized that tangible cues in the store's physical environment, such as lighting, significantly affect consumers' emotional responses and, consequently, their buying decisions. This aligns with the findings of

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[1] *English Dictionary: Lighting. [Online] Available from:*
https://www.collinsdictionary.com/dictionary/english/lighting#google_vignette

Ndengane et al. (2021), who demonstrated that store atmospherics, including lighting, cleanliness, and music, play a vital role in enhancing customer satisfaction and influencing their intention to revisit stores. In the context of impulsive buying, Hussain and Siddiqui (2019) found that the store environment, including elements such as lighting, directly affects impulsive buying tendencies. Their research indicated that while impulsive traits drive consumer behavior, atmospheric factors, including lighting, also play a significant role in stimulating impulse purchases. This highlights the importance of creating a conducive store environment to foster impulse buying, particularly among younger consumers. Tanveer et al. (2022) further explored the impact of store lighting on impulsive buying behavior, emphasizing that lighting, along with other environmental factors, significantly influences consumers' emotional states and purchasing decisions. The findings suggested that a well-lit environment could enhance the shopping experience, leading to increased impulsive buying behavior. Additionally, Barros et al. (2019) conducted a cross-cultural study on the influence of store atmosphere on impulsive buying behavior, revealing that store elements such as lighting and layout significantly impacted emotional responses, which in turn influenced purchasing decisions. The study highlighted the moderating role of cultural characteristics, emphasizing that environmental factors could have varying effects based on cultural contexts. Overall, the existing literature indicates a strong link between store lighting and consumer purchasing behavior. The findings from these studies underscore the need for retailers to strategically manage store lighting to create appealing environments that enhance consumer experiences and influence their purchasing intentions. Given the gaps identified in the literature, particularly regarding the specific context of younger consumers in Mongolia, this study aims to build upon these insights and further investigate the nuanced effects of store lighting on purchasing decisions among this demographic. This research aims to investigate how store lighting affects consumer decision-making through purchase intention. This study aims to address the following research questions:

1. Is there a relationship between store lighting and consumer purchase decision behavior?
2. Does store lighting influence consumer decision-making behavior through purchase intention?

Hypotheses development
Presentation and lighting of the store environment and purchase decisions
The role of store lighting and presentation in shaping consumer behavior has been extensively explored in recent research, suggesting a significant influence on purchase decisions. He et al. (2022) conducted a field experiment revealing that various lighting methods can enhance the attractiveness of clothing colors, which in turn creates a more appealing shopping atmosphere that stimulates consumer interest and purchase intentions. This aligns with Koernig's (2003) literature review, which highlighted that store atmosphere, including lighting, is a critical factor in shaping customer evaluations and their subsequent purchasing behavior. Furthermore, Ndengane et al. (2021) found that atmospheric factors, including lighting, significantly contribute to customer satisfaction within a retail context, indicating that a well-lit environment encourages customers to engage longer with products, thereby increasing the likelihood of purchase. In line with this, Pathak and Mavridis (2021) emphasized the importance of lighting in consumer behavior, arguing that appropriate lighting not only enhances product visibility but also positively influences customer emotions and perceptions, ultimately affecting their buying decisions. Moreover, Hussain and Siddiqui (2019) explored how store atmospheric cues, particularly lighting, can provoke impulsive buying behavior. Their findings suggest that enhanced visibility and attractiveness driven by optimal lighting conditions lead to spontaneous purchases, underscoring the connection between lighting and purchase behavior. Angula and Zulu (2021) also highlighted the impact of lighting on the in-store customer experience, illustrating that favorable lighting conditions contribute to a more enjoyable shopping experience, thereby enhancing the likelihood of purchases. Lastly, Biswas et al. (2017) demonstrated that ambient lighting significantly affects consumer choices in a dining context, linking mental alertness and decision-making to the effectiveness of lighting. Although focused

on restaurants, these insights can be extrapolated to retail environments, suggesting that lighting influences cognitive processes that ultimately shape purchase decisions. In summary, the confluence of these studies underscores the critical role that store presentation and lighting play in influencing consumer behavior and purchasing decisions. Therefore, we propose that:

H1a: The presentation and lighting of the store environment will positively affect purchase decisions

Customer shopping intention and purchase decision

The relationship between customer shopping intention and purchase decision has been extensively documented in consumer behavior literature. Shakuntala and Ramantoko (2023) demonstrated that purchase intention significantly influences purchase decisions, emphasizing that effective communication on social media enhances brand equity, which in turn boosts purchase intention and decision. This finding indicates that positive shopping intentions, influenced by external factors such as social media, can translate directly into purchasing actions. Kusumawati et al. (2021) further corroborate this relationship by identifying the impact of various marketing-mix elements on purchase intention, which subsequently affects purchase decisions in the online music market. The study highlights that consumers' intentions to purchase are shaped by the perceived value and effectiveness of marketing strategies, ultimately leading to actual buying behavior. In the context of micro, small, and medium enterprises (MSMEs), Hairudinor and Rusidah (2023) found a strong positive association between digital marketing efforts and both purchase intention and actual purchase decision. Their study emphasizes that as customers' purchase intentions rise due to effective digital marketing, so do their actual purchase decisions, reinforcing the notion that a heightened intention serves as a precursor to purchasing actions. Suyanto and Dewi (2023) also support this hypothesis, noting that product characteristics and promotional strategies significantly enhance purchase intentions, which, in turn, lead to higher purchase decisions. Their findings emphasize the sequential nature of consumer behavior, where intention acts as a critical intermediary between marketing stimuli and actual purchasing. Li and Jaharuddin (2021) explored the impact of background factors on purchase intention in China's organic food market, finding that positive purchase intentions are linked to actual purchase decisions. Their study also identified the moderating role of word-of-mouth, further illustrating that strong purchase intentions can enhance decision-making processes. Maftuchach and Safitri (2023) addressed the effects of ease of use and promotion on purchase intention, ultimately linking these intentions to purchase decisions. Their findings confirm that when customers have a positive shopping intention, it significantly influences their likelihood of making a purchase, highlighting the importance of understanding customer psychology in shaping consumer behavior. In summary, these studies collectively support the assertion that customer shopping intention is a crucial predictor of purchase decisions. Therefore, we propose that:

H1b: Customer shopping intention has a positive effect on purchase decision

Presentation and lighting of the store environment and purchase decisions through the customer's purchase intention.

The effect of store lighting on customer behavior has been demonstrated in multiple studies. He et al. (2022) found that different lighting methods, such as mixed or partial lighting, can enhance the attractiveness of certain clothing colors, creating a positive shopping atmosphere and stimulating purchase intentions. Similarly, Koernig (2003) demonstrated that lighting, as part of the overall store atmosphere, plays a crucial role in influencing customer evaluations and loyalty, suggesting that well-designed lighting can positively affect how consumers perceive products and stores, ultimately shaping their intent to purchase. The study by Ndengane et al. (2021) further supports this, showing that lighting, when combined with other atmospheric elements, improves customer satisfaction and encourages them to spend more time in the store, indirectly enhancing their purchase intentions. In the same vein, Pathak et al. (2021) highlighted how lighting impacts the duration consumers spend examining merchandise, which in turn influences their intent to purchase. Therefore, based on these studies, we propose that:

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H1: *The presentation and lighting of the store environment will affect purchase decisions through the customer's purchase intention.*

Store lighting and consumer purchasing decisions

Several studies have shown that lighting not only enhances the store environment but can also directly impact consumer behavior. Hussain and Siddiqui (2019) found that while impulsive buying is often driven by personality traits, store lighting plays a crucial role in encouraging spontaneous purchases by enhancing product visibility and appeal. The research by Angula and Zulu (2021) similarly indicated that store lighting directly contributes to creating a positive in-store experience, which leads to increased consumer loyalty and repeat purchases. Further, Biswas et al. (2017) demonstrated that ambient lighting can influence specific consumer behaviors, such as food choices in restaurants, by affecting mental alertness and decision-making. In the retail context, He et al. (2022) showed that consumers are more likely to be drawn to products displayed under favorable lighting conditions, directly influencing their purchasing decisions. Therefore, based on this body of research, we propose that:

H2: *Store lighting will directly influence consumer purchasing decisions.*

Theoretical framework

The theoretical framework presented here outlines the intricate relationships between store lighting and presentation, customer shopping intention, and purchase decisions. It posits that both store lighting and presentation directly influence purchase decisions while also exerting an indirect effect through customer shopping intention. The first component of this framework, Store Lighting and Presentation, encompasses various aspects of the store environment, such as the quality and style of lighting and the visual presentation of products. Research has shown that well-designed lighting significantly enhances product visibility and attractiveness, thereby creating a more appealing shopping atmosphere (He et al., 2022; Koernig, 2003). This positive environment encourages customers to engage more deeply with the products on display. The second component, Customer Shopping Intention, reflects the consumers' intention to make a purchase based on their perceptions of the store environment. Previous studies have demonstrated that positive shopping intentions can significantly influence actual purchase decisions (Shakuntala & Ramantoko, 2023; Hairudinor & Rusidah, 2023). When consumers feel positively about their shopping experience, they are more likely to proceed with a purchase. Finally, the Purchase Decision represents the actual decision made by the customer to buy a product. The literature indicates that purchase decisions result from multiple influencing factors, including shopping intention and the effects of store atmospheric cues, such as lighting (Hussain & Siddiqui, 2019; Angula & Zulu, 2021). This framework serves to highlight how the interplay between a well-presented store environment and consumer intentions can ultimately lead to increased purchasing behavior.

Various theories explain the connection and relationship between factors influencing consumer behavior, including Schema Theory, Inference Theory, Possibility Theory, Behavioral Decision Theory, Mehrabian-Russell's Theory, S-O-R (Stimulus-Organism-Response) Theory, the Theory of Reasoned Action (TRA), the Theory of Planned Behavior (TPB), and Nudge Theory, among others. For this study, the Theory of Reasoned Action (TRA) was selected as a basis for a conceptual model. The Theory of Reasoned Action (TRA) was first proposed by Martin Fishbein in 1967 to explain intentional social behavior. Ajzen and Fishbein (1980) later introduced the "Theory of Planned Behavior" to further predict and explain consumer behavior by addressing why people behave as they do and how their behavior can be modified. The Theory of Planned Behavior, as an extension of the TRA, has served as a foundational framework in numerous studies. TRA is a well-established theory of human behavior that has been successfully applied across various fields. Understanding consumer buying behavior is crucial for retailers as it provides insights into what is important to consumers and what influences their decision-making (Murray, Elms, & Teller, 2017). Van Heerden and Ngambi (2010) highlight that comprehending

the impact of lighting on consumer decision-making can be highly influential. Behavior change is generally more effective when it focuses on a single element rather than multiple factors. Establishing a clear and well-defined behavior can lead to more accurate results and make the findings more applicable to the subject (Rhodes, Fishbein, & Reis, 1997). Consequently, the Theory of Reasoned Action (TRA) (Ajzen & Fishbein, 1980), a widely recognized theory of human behavior, was utilized in this study to explore the effects of lighting. The following model, proposed by the researcher, is based on the Theory of Reasoned Action (TRA) and serves as the conceptual framework for the study.
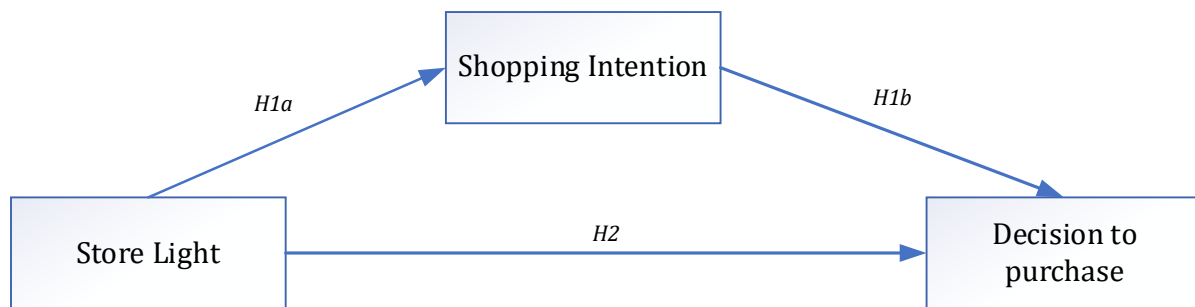

Figure 1. A conceptual model

To test the proposed model, a survey was conducted involving 412 customers from nine large chain stores in Ulaanbaatar, Mongolia. The survey was conducted and completed by a 30-item questionnaire using a 5-point Likert scale.

Research Methodology
This study employs a quantitative approach, representing a theoretical and multivariate observational "causal" process. The primary aim of this research is to examine how store lighting impacts consumer purchasing decisions, with a focus on the Theory of Reasoned Action (TRA) to explain consumer behavior. Quantitative methods are extensively employed in research within this domain, as they enable quantifying intentions and analyzing relationships and differences among variables (Creswell & Creswell, 2017). The Purchase Decision was assessed using the following: I bought more than I planned to buy from this store, and I ended up spending more than I planned because there were things that triggered the urge to buy, Overall, I am satisfied with my purchase from this store, and I enjoyed my time at this store. The Purchase Intention (SI) was measured by items such as I would be happy to recommend this store to others; If I ever need to make a purchase again, I want to use this store, and I have a generally positive opinion about this store on a Likert scale. To assess the impact of store lighting on the purchase intentions of customers of retail stores and to test the proposed hypotheses, we conducted a study involving customers visiting major chain stores in Ulaanbaatar. Quantitative methods, specifically questionnaires, were employed for this study. The questions were adapted from existing academic research and translated to suit Mongolian users. Additionally, Lighting was assessed through the following statements: The lighting makes the product stand out; The store lighting facilitates the readability of product labels and details; The lighting in this shop is of high quality; The lighting is appropriate for the store environment. All statements in the questionnaire are measured with a 5-point Likert scale ranging, from 1 for strongly disagree to 5 for strongly agree.

Research Analysis and Results

Sample characteristics are presented in the form of demographic profiles of respondents in Table 1.

Table 1. Demographic profile of survey respondents

Indicators		Frequency	Percentage
Age group	18-24	238	57.8
	25-34	174	42.2
Gender	Male	138	33.5
	Female	274	66.5
Occupation	Employed	166	40.3
	Student	232	56.3
	Unemployed	14	3.4
Education	Undergraduate	210	51.0
	Secondary	202	49.0
Family income (monthly)	up to 1mln MNT	72	17.5
	1-2 mln. MNT	124	30.1
	2 or more mln. MNT	216	52.4
Time spent in store	up to 30 minutes	180	43.7
	30 min.-1 hours	134	32.7
	1-2 hour	71	17.2
	more than 2 hours	27	6.5
Money spent per visit	up to 50.000 MNT	125	30.3
	51.000-100.000 MNT	126	30.6
	101.000-150.000 MNT	73	17.7
	151.000-200.000 MNT	43	10.4
	201- 350.000 MNT	31	7.5
	351.000 or more MNT	14	3.4
Number of visits to the store per	1-2 times	72	17.5
	3-5 times	146	35.5
	6-8 times	67	16.1
	9 or more	127	30.9

The sample in this study are consumers, who were regular shoppers of the selected stores. Sampling was done by purposive sampling with the criteria that they are customers of the selected 9 stores, aged 18-34 years, and decided to visit the store and make purchases by themselves. The results indicated that the highest percentage of respondents was observed for females (66.5%). Most respondents (76.1%) spend up to 1 hour in the store, spending 50'000-100'000 MNT per visit (60.9%), and have visited the selected stores either 3-5 or 9 times per month. Income as an economic variable was categorized into four categories. The highest percentage of respondents was observed for those with more than 2 mln. MNT. By education level, the respondents were divided into two groups, having bachelor's degrees or secondary education, of almost similar size (Table 1). To reduce weaknesses such as the subjectivity of respondents' answers, researchers emphasized the seriousness of respondents in answering the questionnaire.

Table 2. Rotated Component Matrix

		1	2	3
Shopping intention (SI)	B17.5	.828		
	B17.6	.809		
	B17.3	.805		
	B17.4	.802		
	B17.2	.767		
	B17.7	.764		
	B17.10	.739		
	B17.8	.737		
Decision to purchase (PD)	B2.2		.801	
	B2.3		.787	
	B2.1		.776	
	B2.4		.762	

	B2.6	.717	
	B2.5	.701	
Store Light (SL)	B8.3		.798
	B8.2		.786
	B8.1		.780
	B8.4		.698

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.
a. Rotation converged in 5 iterations.

Model Measurement Evaluation

The data analysis is done by using inferential statistics. Before testing the variable relationships, analysis is carried out of the validity and reliability. Cronbach's alpha, indicating the reliability of the questionnaire measuring internal consistency, was found to be at an acceptable level (purchase decision-making: 0.882; lighting: 0.749; purchase intention: 0.942). These values suggest that the internal consistency among the variables is satisfactory, allowing the questionnaire results to be used for further model evaluation and analysis (Buyantur, O., et all., 2023). In this study, exploratory factor analysis (EFA) was conducted. Kaiser-Meyer-Olkin and Barlett's test with Varimax rotation and Principal Component Analysis extraction method were performed. As a result, the KMO index for the model (KMO=.919) was above 0.7, which is in a good range of analysis[2]. Additionally, Bartlett's test of the Sphericity of both groups was significant (Sig. = .000), which implies a sufficient correlation between these factors. The factor loading of all items is well above the minimum requirement (.60)[3]. The survey employed a questionnaire with three sub-groups of variables and 30 items. According to the results of the principal component analysis, 18 items from these three groups were deemed valid. Further, Process v.4.2 by Andrew F. Hayes regression was used for the analysis of the effect on purchase decisions through the intention of the 18-34 age group of customers.

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Run MATRIX procedure:

***************** PROCESS Procedure for SPSS Version 4.2 ****************

        Written by Andrew F. Hayes, Ph.D.      www.afhayes.com
        Documentation available in Hayes (2022). www.guilford.com/p/hayes3

***************************************************************************
Model : 4
   Y : PD
   X : SL
   M : SI

Sample
Size: 412

***************************************************************************
************** TOTAL, DIRECT, AND INDIRECT EFFECTS OF X ON Y **************

Total effect of X on Y
   Effect      se        t         p       LLCI      ULCI     c_cs
   .3880     .0357   10.8771    .0000     .3179     .4581     .4732

Direct effect of X on Y
   Effect      se        t         p       LLCI      ULCI     c'_cs
   .2129     .0409    5.2006    .0000     .1324     .2934     .2597

Indirect effect(s) of X on Y:
        Effect    BootSE   BootLLCI   BootULCI
   SI   .1750     .0415     .1050      .2656

Completely standardized indirect effect(s) of X on Y:
        Effect    BootSE   BootLLCI   BootULCI
   SI   .2135     .0376     .1431      .2876

********************** ANALYSIS NOTES AND ERRORS ***********************

Level of confidence for all confidence intervals in output:
   95.0000

Number of bootstrap samples for percentile bootstrap confidence intervals:
   5000

------ END MATRIX -----
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[2] *B. G. Tabachnick and L. S. Fidell, Using Multivariate Statistics, 4th ed. New York: HarperCollins, 2001.*
[3] *F. Hair Jr. et al., Multivariate Data Analysis, 7th ed., Prentice Hall, 2010*

Furthermore, Process v.4.2 by Andrew F. Hayes was utilized to analyze the mediation effect of shopping intention on purchase decisions for the 18-34 age group customers. The regression analysis revealed a direct effect of store lighting on purchase decisions of 0.2129 (p < 0.001), indicating statistical significance and supporting hypothesis H1a. The indirect effect of store lighting on purchase decisions through shopping intention was 0.1750 (p < 0.001), which supports hypothesis H1b. These findings indicate a partial mediation effect of shopping intention on the purchase decisions of customers in supermarkets and convenience stores, suggesting that lighting significantly influences purchase decisions. The results showed that purchase intention mediates the relationship between store lighting and purchase decisions (Effect = 0.175, Boot SE = 0.0415, Boot LLCI = 0.105, Boot ULCI = 0.2656), thus supporting hypotheses H1, H1a, and H1b. Overall, the findings highlight that purchase intention serves as both a direct and indirect predictor of purchase decisions, reinforcing the importance of store lighting in influencing consumer behavior. This comprehensive analysis offers valuable insights into the factors at play in the purchasing decisions of the target age group.
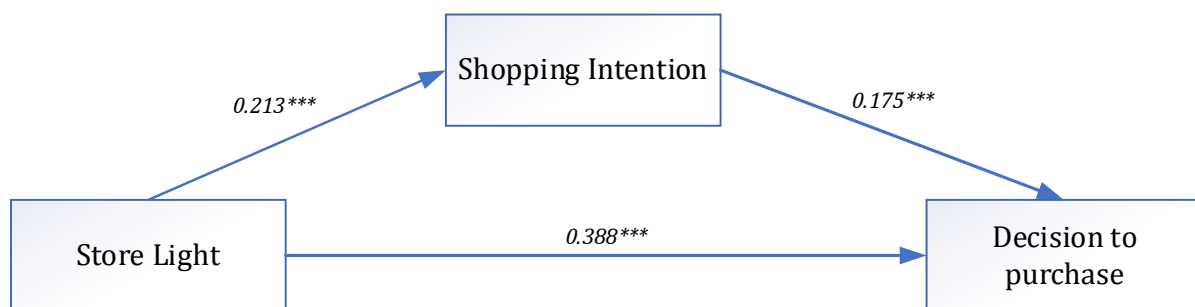

Figure 2. An effect of store light on Decision to purchase

Conclusion and Discussions

This study has delved into the complex relationship between store lighting, customer shopping intentions, and purchase decisions among younger consumers in Ulaanbaatar, Mongolia. Utilizing the Theory of Reasoned Action (TRA) as a foundational framework, the research illustrates how well-designed store environments, particularly lighting, significantly influence consumers' intentions and decisions to make purchases. The findings indicate that store lighting has both a direct effect on purchase decisions and an indirect influence through shopping intentions. Mediation analysis confirms that positive shopping intentions serve as a significant intermediary between store lighting and purchasing behavior, emphasizing the importance of creating an appealing store atmosphere to enhance consumer engagement and satisfaction. These results contribute to the existing literature by providing empirical evidence that supports the critical role of retail atmospheric cues, such as lighting, in shaping consumer behavior. Retailers can leverage these insights to optimize their store environments, thereby improving the overall shopping experience and encouraging higher purchase rates. Given that a substantial portion of respondents were young consumers aged 18 to 34, the implications of this study are particularly relevant for retailers targeting this demographic, as their shopping behaviors are significantly influenced by the sensory aspects of the shopping environment. Moreover, the study underscores the significant impact of store lighting on consumers' purchasing decisions, highlighting how effective lighting enhances the shopping experience and influences purchase intentions. Specifically, the presentation of the store environment, in conjunction with its lighting, plays a crucial role in shaping purchase decisions by affecting customers' intentions to shop. The findings suggest that improving store lighting can positively influence consumer perceptions and reactions, ultimately increasing the likelihood of purchase. Based on these research results, several conclusions can be drawn. First, store lighting influences purchasing decisions by enhancing the customer's desire to buy while in the store. Second, the effect of store lighting on purchasing decisions is statistically significant, varying based on several factors such as the lighting in different store sections, the illumination of product shelves, the clarity of product

visibility, the readability of product labels, the overall appropriateness of the lighting for the store, and the quality of the light itself. Third, analysis of the proposed hypotheses reveals a positive and direct effect of store lighting on customers' purchase decisions, with approximately two-thirds of customers indicating that they are influenced by the lighting in the store, corroborating previous research findings. Regardless of the store type or layout, effectively adjusting lighting for products, counter shelves, and shopping areas can significantly enhance the store environment. Proper lighting highlights products by illuminating them effectively, creates spatial distinctions by delineating different sections of the store, enhances the store's image by improving its overall appearance and organization, and guides customer attention by directing focus from one feature to another upon entering the store. Furthermore, bright lighting conditions encourage more frequent inspection and handling of products compared to dim lighting. Research indicates that products displayed under high light levels are perceived as more attractive than those under lower light levels, even when the spectral distribution remains constant.

Theoretical Applications
This study provides significant theoretical contributions to the understanding of consumer behavior, particularly regarding the influence of environmental factors on purchasing decisions. Firstly, it expands the application of the Theory of Reasoned Action (TRA) by demonstrating how store lighting serves as a crucial atmospheric cue that affects consumer intentions and decisions. This integration encourages further exploration into the relationships between other sensory elements, such as scent and sound, and their combined effects on shopping behaviors. Additionally, the findings highlight the mediating role of shopping intentions, suggesting that future research could investigate the specific mechanisms through which store lighting influences these intentions. This framework can also be applied in diverse retail contexts, enriching the academic discourse around consumer behavior in physical shopping environments.

Managerial Applications
From a managerial perspective, the insights derived from this study can guide retail practices to optimize store environments and enhance the shopping experience. Firstly, retail managers can leverage the findings to assess and improve their store lighting, ensuring it aligns with the preferences of their target demographic, particularly younger consumers. Effective lighting strategies can create a more inviting atmosphere that encourages consumer engagement, leading to increased purchase intentions. Secondly, training programs for store employees can be developed to emphasize the importance of maintaining optimal lighting and presentation standards. This empowerment can enhance staff awareness of how their actions impact customer experiences and purchasing decisions. Lastly, the study's insights can inform strategic decisions regarding store layouts and product placements. By situating high-margin or popular items in well-lit areas, retailers can maximize visibility and attract consumer attention, ultimately driving higher sales and improving overall store performance.

Limitations and Future Research Directions
Firstly, one limitation of this study is its focus on a specific demographic group—young consumers aged 18 to 34 in Ulaanbaatar, Mongolia. This narrow demographic scope may limit the generalizability of the findings to other age groups or cultural contexts. Future research could expand the sample to include a broader range of consumers, examining how different demographics perceive and react to store lighting. This would provide a more comprehensive understanding of consumer behavior across various segments and cultures. Secondly, the research relied on self-reported data through questionnaires, which may introduce biases such as social desirability or recall bias. Respondents might provide answers they believe are expected rather than their true opinions or behaviors. To address this limitation, future studies could incorporate observational methods or experimental designs to collect more objective data on

consumer behavior in response to different lighting conditions. Thirdly, the study focused solely on the direct and indirect effects of store lighting on purchase decisions without considering other atmospheric factors, such as scent, music, or store layout. While this study provides valuable insights into the role of lighting, it would be beneficial for future research to adopt a holistic approach, exploring the interplay between multiple atmospheric cues and their combined impact on consumer behavior. Finally, the temporal aspect of consumer behavior was not explored in depth. This study assessed purchasing decisions in a single shopping context, but consumer reactions to store lighting may vary over time or across multiple visits. Future research could investigate how repeated exposure to different lighting conditions influences long-term shopping intentions and purchasing behavior, thereby providing insights into consumer habits and loyalty.

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