**The Impact of the Physical Environment in the Hospitality Industry**
by

Luana Nanu

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Approved by

Imran Rahman, Chair, Associate Professor, Nutrition, Dietetics & Hospitality Management
Faizan Ali, Associate Professor, School of Hospitality & Tourism Management
David Martin, Associate Professor, Nutrition, Dietetics & Hospitality Management Veena
Chattaraman, Professor, Consumer, and Design Sciences
Jennifer Robinson, Professor, Psychology

**Abstract**

The physical environment is amongst the few tangible cues available for customers when it comes to hospitality services and is meant to draw the customers into space and create a visual narrative that they can remember long after their experience. Considering the simultaneous production and intangibility, as you may not touch or feel a hospitality service before you experience it, the physical environment plays a vital role in impacting customers' moods, expectations, and emotions as well as in assessing the quality of the service provider. Consequently, the physical environment is observed to have a pivotal role in influencing customer intentions and behavior towards service providers in various facets of the hospitality industry.

The objectives of this dissertation are to understand the current state of physical environment research in the hospitality field and to identify the major gaps. Moreover, this dissertation also aims to explore the use of theories of cognitive psychology in conjunction with upper-midscale hotels and trending designs such as biophilic design. To achieve these objectives, the dissertation takes the form of three independent articles which answer 3 research questions and explores 12 hypotheses via both qualitative and quantitative methods. The overall arching theme of the 3 independent articles is the physical environment.

The first article is a systematic literature review within the hospitality context in the last 20 years. This article identified all hospitality-related research as published in the top 5 research journals listed in the Social Sciences Citation Index (SSCI). The scope of this literature review is to understand what has been done in the past in the field of hospitality physical environment research, what are potential gaps and saturated areas, and what should be explored in the future.

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The second article draws from the gaps that were identified in the systematic literature review, mainly the lack of studies on the interior design of midscale hotels and the multi-dimensional attributes of the physical environment, the perceiver, and the context. This study also applied design-specific models and theory in a hospitality context, which have also proven to be a gap in the systematic literature review. The scope of this article is to understand how consumer process the physical environment and how does it lead to behavioral intentions. The results indicated that the booking intentions were higher for the upper midscale hotel room and bathroom scenario that followed the MAYA principle compared to any other combination. Moreover, travel expertise and travel goals moderated the relationship between the design type and booking intentions. The scenario designed on the MAYA principal led to higher booking intentions for the experienced traveler as well as for the utilitarian goal of traveling. This study also pointed out that consumer pleasure and interest mediated the effects of typicality and innovativeness on booking intentions. However, fluency and disfluency did not mediate the effects of typicality and innovativeness on pleasure and interest.

The third article analyzed the influence of biophilic design in a major public place of the hotel, the lobby, and its influence on the emotional experiences of hotel guests. The public spaces of hotels and biophilic design have been scarce in the last 20 years of research in the hospitality field. Moreover, this study will also investigate the moderating effect of health consciousness, peace of mind, and willingness to pay. The results showed that the biophilic environment positively and significantly affected pleasure and arousal. Moreover, the arousal state significantly and positively influenced the pleasure state. Pleasure and arousal also mediated the effects of the biophilic lobby on willingness to pay more. Similarly, pleasure and

arousal mediated the effects of biophilic design on peace of mind. When customers experienced

peace of mind it also led to a positive and significant effect of wiliness to pay more. Lastly,

health consciousness strengthens the relationship between the biophilic design scenario and

peace of mind however, it did not render significant for willingness to pay more.

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## Overarching Introduction

The dissertation is organized within the framework of three publishable academic articles. The purpose, problem statement, research questions, and hypotheses of the articles are presented in Chapters 1, 2, and 3. Each study contains its own introduction, literature review, and methodology, as well as a detailed presentation of the results and implications. The first article aimed clarify the contribution of the current research on the physical environment, identify the major research themes, and focus areas as well as identify the under-researched areas and future research directions. This first article served as the steppingstone of identifying the focus of article two and three.

Drawing from the Pleasure-Interest Model of Aesthetic Liking (PIA) (Graf & Landwehr, 2017) and the Most Advanced Yet Acceptable (MAYA) principle (Hekkert et al., 2003), the purpose of the second articled is to provide a holistic understanding of how the fluency of mental processing associated with the typicality and innovativeness of the design impacts pleasure and interest, which in turn leads to booking intentions. Moreover, this study will also investigate the moderating effect of the trip goal (hedonic or utilitarian) as well as the travel expertise on the relationship between design type and booking intentions.

Lastly, drawing from the Pleasure-Arousal Theory, and the effects of biophilic design, the purpose of this third article is to understand how the emotional experience of hotel guests impacts their willingness to pay more and feel internal peace and harmony in the form of peace of mind. Moreover, the current study also aims to understand if health consciousness plays a role in the guests' emotional experience when biophilic design is present.

# Definitions of Key Terms

**Fluency:** The subjective experience of ease or difficulty with which we can process information (Oppenheimer, 2008). In the current study it will be measured on a Horizontal slider (a visual analog scale with an internal resolution of 100 steps) using 4 items (Mayer & Landwehr, 2018)

**Pleasure:** According to Reber et al. (2004), aesthetic pleasure is a subjective experience that is directed to an object and not mediated by intervening reasoning. Moreover, Hekkert and Leder (2008) defines aesthetic pleasure as pleasure that comes forth simply from perceiving something using sensory and motor understanding. In the current study, the before-mentioned definition is adapted to hotel room interior design rather than an object. In the current study it will be measured with 3 items from Turner and Silvia (2006), measured using 1–7 bipolar Likert scales.

**Interest –** Represents a pre-insight anticipation, evoked by the appraisal of high stimulation potential and the expectation of coping potential (Silvia, 2008). In the current study it will be measured with 2 items from Turner and Silvia (2006), measured using 1–7 bipolar Likert scales.

**Travel Goal**

> **Hedonic:** The consumption practice as traveling in one's spare time (Hirschman & Holbrook, 1982). The hedonic dimension is more subjective and personal as well as reflecting the potential and desire for product uniqueness, symbolic meaning, and emotional arousal (Gursoy et al. 2006).

> **Utilitarian:** Utilitarian behavior is characterized as functional or task oriented (Dhar & Wertenbroch, 2000). The value for utilitarian behavior results "from some type of conscious pursuit on an intended consequence" (Babin et al., 1994, p.645). In the current study utilitarian trips are ones that are done with the scope of work, rather than vacation, or escape.

**Travel Expertise:** The amount of travel one takes part in on a regular basis. Experienced travelers are more accustomed to a variety of standards and expectations when it comes to traveling (Tussyadiah & Pesonen, 2016). Previous travel experience increases the familiarity with hotels in general (McCleary et al., 2007). Travel experience will be measured using a 3 item scale measured on 5 point Likert scale by Teichmann (2011) as well as using the yearly average number of trips in the U.S. If the participant took less than 4.4 trips per year (average number of trips in the U.S.) then they would be not experienced, anything over would make them experienced

**Booking Intentions:** According to Spears and Singh (2004) purchasing intention is the conscious plan or intention to make an effort to purchase a product; booking intention is similar to purchasing intention, and it refers to the consumer booking a hotel room. Will be measured on a 7-point Likert scale with 3 items by Baek and Ok (2017).

**Room/Bathroom Typicality:** Typicality can be defined as the degree to which an object, or design in the current study, is representative of a category (Blijlevens et al., 2011). In a budget hotel room design, typicality would be defined as a room that offers minimum amenities and meets basic needs of the guest.

**Room/Bathroom Innovativeness:** Is defined by Carbon and Leder (2005) as "originality by virtue of introducing new ideas" (p.587), in other words introducing something new. In the context of budget hotel room design, innovativeness would be using the basic elements that are in the room and giving them a newer, more innovative sense. Examples: Patterns on the bedsheets, colorful wall, colorful carpet, pegs on the wall instead on closet etc.

**Arousal -** The extent to which a person feels stimulated and active (Bigné et al. 2005).

**Biophilic Design -** According to Ryan et al. (2014, p. 62) "biophilia is the deep-seated need for humans to connect with nature". Biophilic design is using elements from the natural world such as plants, sounds, water, and lighting into the built environment (Kellert et al., 2008).

**Health-Consciousness -** According to Becker et al. (1977), health consciousness analyzes the readiness of consumers to undertake health actions. The health-conscious consumers are not only aware of their state of well-being but also motivated to improve and maintain it (Newsom et al., 2005).

**Peace of Mind –** Peace of Mind of PoM is defined as an affective well-being and is characterized by internal peace and harmony (Lee et al., 2012)

**Willingness to Pay More -** Willingness to pay or WTP is defined as the highest amount a customer is willing to pay for a product or service (Ayadi & Lapeyre, 2016). Furthermore, it is the excess amount paid over the "fair" prices that is justified by the "true" value of the product (Wang et al., 2009).

# Chapter 1. Article 1. Physical Environment in the Hospitality Industry: 20 years of research

## 1.1.Introduction

When walking in a hospitality-related establishment, the very first thing that will catch your eye is the physical environment. As customers enter the business, they will get absorbed by the colors, shapes, and atmosphere within the space. The physical environment is amongst the few tangible cues available for customers when it comes to hospitality services (Bitner, 1992), and is meant to draw the customers into space and create a visual narrative that they can remember long after their experience. Considering the simultaneous production and intangibility, as you may not touch or feel a hospitality service before you experience it, the physical environment plays a vital role in impacting customers' moods, expectations, and emotions (Mehrabian and Russell, 1974; Bitner, 1992) as well as in assessing the quality of the service provider (Ryu et al., 2012). Consequently, the physical environment is observed to have a pivotal role in influencing customer intentions and behavior towards service providers in various facets of the hospitality industry (Booms & Bitner, 1982). Owing to the importance of the hospitality industry and its contribution to the global GDP, several researchers from multiple disciplines including environmental psychology and marketing are emphasizing the role and significance of the physical environment for the service providers and consumers in the hospitality industry (Ali & Amin, 2014; Lin & Liang, 2011; Russell & Pratt, 1980; Ryu & Han, 2010).

In the early '70s, Kotler (1973) coined the term 'atmospherics' and stated that atmosphere can affect consumers' behaviors. He defined atmospherics as, "…. *The effort to design buying environments to produce in the buyer specific emotional effects that enhance his purchase probability . . .*" (pp. 50–51). Following a more holistic approach, Bitner (1991)

introduces the servicescape. To describe 'the built environment' or more specifically, "*the man-made, physical surroundings as opposed to the natural or social environment*" (p. 58). Bitner (1992) further adds that the physical surroundings included all the objective physical factors that can be controlled by service firms to enhance customers' and employees' cognitive, emotional and physiological responses. These two terminologies result in intertwined streams of research that help structure the understanding of the physical environment and its conceptualization (Mari & Poggesi, 2013).

In several theoretical and empirical studies, scholars have acknowledged the crucial dimensions of the physical environment including ambient conditions (e.g., temperature, music, odor), spatial layout and functionality (e.g., equipment, furnishing), and signs, symbols, and artifacts (e.g. style of décor) that are particularly pertinent to the hospitality industry (Ali et al., 2016; Apaolaza et al., 2020; Han & Ryu, 2009). These three factors, namely ambient conditions, layout, and functionality, as well as signs, symbols, and artifacts, have been frequently included in most research related to the physical environment and are the most adequate dimensions of the physical environment for customer behavior study in hospitality service settings.

The physical environment has been studied in many different hospitality contexts over the past decades, exponentially increasing in the 21st century. As the world became more connected, at the inset of the 21st century, the physical environment also took a global approach. These studies and the following research have pushed the environmental changes to satisfy customers' enjoyment of the spaces created. Lobbies have been transformed from a place to merely check into a hotel to revenue-producing aesthetically pleasing, bright-colored living

rooms, with tech zones, bars, light dining areas, art galleries and exhibits, and often live music. These studies over the last few decades have attributed too much of the change as consumers' eyes for the physical environment have changed. Much can also be said about the physical environment of another modern gathering place for human enjoyment. Even though there is extensive research conducted on the concept of the physical environment in the hospitality industry, an up-to-date systematic review of the literature related to it is still missing. This is needed to codify people's reactions to different environmental settings. To this point, the research has been used primarily from text alone and hospitality businesses left to do their physical benefit work. This research attempts to obtain what has been studied regarding people's response to environmental settings. By conducting a systematic literature review of the physical environment in the hospitality field, this study will expose what has been done and how to move in the future. Therefore, the purpose of this study is to clarify the contribution of the current research on the physical environment, identify the major research themes, and focus areas as well as identify the under-researched areas and future research directions. Abiding by the original definitions of servicescape (Bitner, 1992) and atmospherics (Kotler, 1973), this paper intends to systematically review the literature currently available on the physical environment in the hospitality industry, explore the trends and developments that have emerged in recent years, explore the theories that were applied, and ultimately identify future avenues of research. This study will have scholars in the hospitality field potential opportunity and guidelines to clearly understand the past and future of physical environment research. In terms of practical contribution, the results of this study can better guide practitioners on how to use the physical environment to their advantage. This study aims to answer the following research questions:

**RQ1:** What is the state of the physical environment research in the hospitality industry as presented by the top scholarly journals in hospitality?

**RQ2:** What are possible research gaps and what areas have been overly saturated?

**RQ3:** What are the recurring themes of the physical environment research in a hospitality context?

The details of this systematic literature review are as follows. First, following this introduction, the next sections will discuss the research methods employed for this study. Second, general descriptive findings are provided:

1. Distribution of research articles by the selected journals and periods

2. Number of articles in specific categories (hotels and resorts, restaurants, casinos, and others)

3. Theories used

4. Analytical methods

Third, the research focus on the main hospitality areas will be presented. Fourth, discussion, research focus, and future research direction are presented.

### 1.2. Methodology

A systematic literature review has been adopted by several scholars in different academic disciplines such as management (e.g. Crossan & Apaydin, 2010), marketing (e.g. Mari & Poggesi, 2013), hospitality (e.g. Myung et al., 2012; Madanaguli et al., 2021), retailing (e.g. Turley & Milliman, 2000), tourism (e,g, Antonova et al., 2021; Le et al., 2019). Contrary to traditional review papers, a systematic literature review is conducted to apply rigorous and reproducible methods of selection and evaluation of the papers and postulate future research

suggestions in line with the past research. To achieve this, the study developed a review protocol containing information on search terms, databases, and screening criteria.

To satisfy a rigorous and reproducible method of collecting all the articles on the interesting topic top five hospitality journals were selected as listed in the Social Sciences Citation Index (SSCI) including the *International Journal of Contemporary Hospitality Management* (IJCHM), *International Journal of Hospitality Management* (IJHM), *Journal of Hospitality and Tourism Research* (JHTR), *Journal of Hospitality and Tourism Management* (JHTM), and *Journal of Hospitality Marketing & Management* (JHMM). Based on the systematic literature review process guidelines provided by (Peričić & Tanveer, 2019) the following set of inclusion/exclusion criteria:

- Only full-length published peer-reviewed journal articles were included; hence, books, book chapters, book reviews, introductions to special reports, research notes, conference proceedings, working papers, and other unpublished works were excluded (Kim, 2020).
- They had to be published in these five journals during the last 20 years i.e., from 2000 to 2020, as this marks an era of a significant transformation to adapt to the changing demands of guests (Coles, 2021).

Like many published systematic review articles (Kim, 2020; Myung et al., 2012; Streimikiene et al., 2021), this study conducted a content analysis to examine articles individually. Journal articles were downloaded and screened in May and June 2021 for review. To ensure the substantive relevance, only those papers were downloaded whose abstracts and

keywords had contained at least one of the following words, often considered synonyms: 'physical environment', 'servicescape', 'atmospherics', 'physical surrounding', 'physical dimension', 'physical setting', 'physical design', 'tangible element', 'tangible dimension', 'environmental dimension', 'service environment', 'architectural design' and 'aesthetics element'. To adhere to Bitner's (1992) servicescape model, we also extended our search for the abstract containing words related to ambient conditions such as 'scent', 'smell', 'perfume', 'fragrance', 'odor', 'aroma', 'olfact', 'music', 'light', 'illumination', 'color'. Moreover, for the dimension of signs, symbols & artifacts, words such as 'sign', 'signage', 'decor', 'décor', 'style of décor', 'personal artifact', 'artwork', 'wayfinding' were searched. For the last dimension of spatial layout and functionality, the words that were searched included 'layout', 'fixture', 'furnishing', 'equipment', 'design', and 'space'.

Based on the criteria explained, a total of 210 research papers were retrieved from the mentioned journals' databases. When searching in the journal database by using the mentioned keywords, often papers that did not focus on the physical environment were retried, simply due to the matching of the keywords. These papers were carefully examined to ensure they adhere to the above-mentioned criteria. The papers that did not fit the topic were removed. All the retained papers were read again to ensure that they align with the inclusion criteria. Consequently, a final sample emerged that consisted of 155 papers. An Excel worksheet was created to document the characteristics of each paper, including a paper ID, name of the Journal, authors, title of the paper, year of publication, sample, setting, the country where research was conducted, methods, analytical analysis tools, main findings, used theory. The papers were examined carefully once

more and recorded their characteristics in the Excel worksheet. Figure 1 is a PRISMA flowchart that shows the identified papers, and the study selection process (Kim, 2020).

**Figure 1. Flow chart**
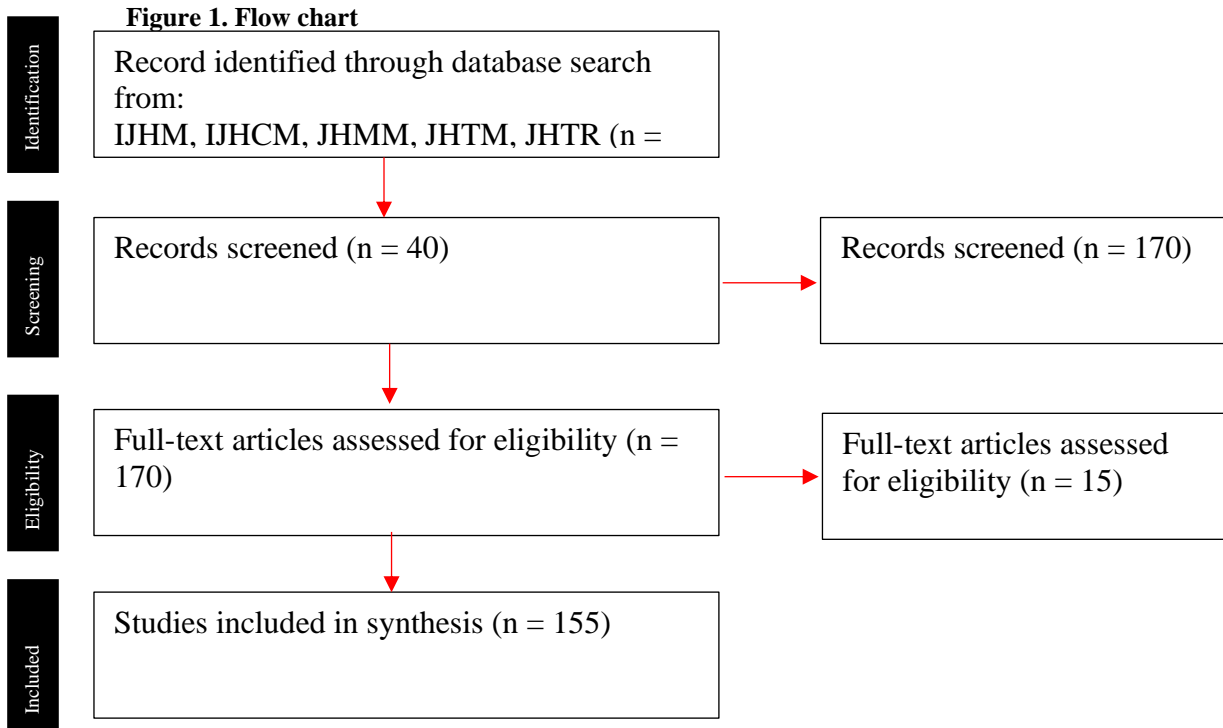


*Note:* IJCHM: International Journal of Contemporary Hospitality Management

IJHM: International Journal of Hospitality Management

JHTR: Journal of Hospitality and Tourism Research

JHTM: Journal of Hospitality and Tourism Management

JHMM: Journal of Hospitality Marketing & Management (JHMM).

**1.3.Results**

**7.3.7.** *General Descriptive Findings*

In this section, articles were analyzed by: (1) distribution of research papers by the journal; (2) number of articles in the areas of lodging, restaurant, casinos, and others (3) geographic locations of the studies; (4) used theories.

*1.3.2. Distribution of Articles by Journal*

Table 1 presents the distribution of research articles by journal. IJHM (72) by far published the most articles, followed by IJCHM (37), JHTR (17), and JHMM (20) published relatively close number of research articles, while JHTM (9), published the least.

**Table 1. Distribution of research articles by journals.**

| Name of journal | Number of Articles |
|---|:---:|
| International Journal of Hospitality Management (IJHM) | 72 |
| International Journal of Contemporary Hospitality Management (IJCHM) | 37 |
| Journal of Hospitality & Tourism Research (JHTR) | 17 |
| Journal of Hospitality and Tourism Management (JHTM) | 9 |
| Journal of Hospitality Marketing & Management (JHMM) | 20 |
| Total number of articles | 155 |

*1.3.3. Articles by area and time distribution*

The number of articles published in each area is presented in table 2, as guided by (Myung, et al. 2012). Each area of publication is important as it will offer an overview of each area that has been overly researched, as well as where there are more opportunities to explore.

The major research areas identified were lodging (55 articles), restaurant (64), Casinos (10), and Bars and Nightclubs (6 articles). Other areas were also studied as presented in table 2, however, there were less than 5 articles per area identified. Looking at the trend over the years, 2019 and 2020 were specifically rich for the areas of lodging and restaurants, indicating the topic of physical environment gained more value and importance. Throughout all five top hospitality journals, the area of restaurants was the most studied, followed by lodging and casinos.

**Table 2. Number of articles by areas.**

| Years | Lodging | Restaurant | Casinos | Airports | Cafes and Coffee Shops | Bars and Nightclubs | Cruises | Events | Retail | Theme Parks | Spas | Golf | Hospitals |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 2000 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2001 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2002 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2003 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2004 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2005 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2006 | 4 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2007 | 0 | 2 | 1 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2008 | 1 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2009 | 1 | 7 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2010 | 1 | 4 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2011 | 2 | 6 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2012 | 1 | 5 | 2 | 0 | 1 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| 2013 | 1 | 5 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 |
| 2014 | 1 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| 2015 | 4 | 2 | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 |
| 2016 | 5 | 0 | 1 | 0 | 1 | 0 | 0 | 1 | 0 | 1 | 0 | 1 | 0 |
| 2017 | 2 | 5 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 1 |
| 2018 | 7 | 5 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 | 1 |
| 2019 | 11 | 4 | 1 | 0 | 1 | 1 | 1 | 1 | 1 | 0 | 0 | 1 | 0 |
| 2020 | 13 | 12 | 0 | 1 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| Total | 55 | 65 | 10 | 1 | 4 | 6 | 3 | 3 | 2 | 1 | 2 | 2 | 2 |

## 1.3.4. Geographical locations of study

The hospitality industry has an international outlook and therefore table 3 presents the presence of physical environment studies across different continents (Myung et al., 2012). Countries were grouped into 7 continents. Studies that used more than one location were categorized as "cross-countries" (Myung et al., 2012). Of 155 studies covering countries, slightly over one third were conducted in North America (38.06%) and Asia (38.06%). Europe was covered in 14.19% of studies, while Oceania, Africa, Middle East, South America were under 3%. In terms of cross-country studies, 5.81% of studies adopted this method of collecting data.

**Table 3. Study locations.**

| Study location | Number of articles | % |
|---|---|---|
| North America | 59 | 38.06% |
| Asia | 59 | 38.06% |
| Europe | 22 | 14.19% |
| Cross-countries | 9 | 5.81% |
| South America | 2 | 1.29% |

| | | |
|---|---|---|
| Oceania | 2 | 1.29% |
| Middle East | 1 | 0.65% |
| Total | 155 | 100% |

## *1.3.5. Type of research*

Table 4 presents the type of research that has been conducted for the identified studies. As presented, most of the studies have adopted a quantitative approach, survey approach (115 articles), followed by experimental design (19 articles), mixed methods (13 articles), and finally interviews (5 articles).

**Table 4. Type of research**

| Type of Research | Frequency |
|---|---|
| Survey | 115 |
| Experimental | 19 |
| Mixed Method | 13 |
| Interview | 5 |

## *1.3.6. Statistical techniques used*

Almost half of the articles employed Structural Equation Modelling for their analysis (79 articles), followed by analysis of variance (ANOVA, MANOVA) (23 articles).

**Table 5. Statistical methods**

| Statistical methods | Frequency |
|---|---|
| SEM | 79 |
| Analysis of Variance | 23 |
| Factor analysis | 6 |
| Logistic regression | 5 |
| Multiple Regression | 5 |
| T-test | 5 |
| Hierarchical regression | 4 |
| Analysis of Covariance | 2 |
| Deductive; Inductive | 2 |
| Grounded theory | 2 |

| | |
|---|---|
| Hierarchical Linear Model | 2 |
| Means and frequencies | 2 |
| Behavioral Mapping | 1 |
| Chi Square | 1 |
| Conjoint analysis | 1 |
| Content Analysis; Hermeneutic Circle of Constant Evaluation | 1 |
| Correlation analysis | 1 |
| Hierarchical multiple regression | 1 |
| Linear Regression | 1 |
| Multi-level Analysis | 1 |
| Nested structural equation modeling | 1 |
| Netnography | 1 |
| OLS Regression | 1 |
| Paired t-test | 1 |
| Principal Component Analysis (PCA) | 1 |
| Semi-log regression analysis | 1 |
| Smart-PLS | 1 |
| Thematic analysis | 1 |
| Triangulation Method | 1 |

### 1.3.7. Adopted theories

Theory-guided research is becoming the norm in hospitality research (Moscardo, 2021). Theory is highly important in research as it provides a comprehensive and complex outlook and therefore it is crucial for any research work to give direction and to validate or disapprove a phenomenon. Theoretical basis helps to decipher the way things are as well as the basis of specific actions. More so, in the context of the physical environment where one investigates how the physical environment Interacts with emotions, feelings, and behaviors, Table 6 presents the various theories applied across the 155 articles. As presented in the table, 54 studies did not utilize a theory, Stimulus, Organism, Response (S-O-R) was the most utilized theory (30). The

articles applied 59 different theories from different fields, indicating the multidisciplinary aspect
of hospitality research. Many of the theories were used on a one-time basis, just a few were used
across several studies.

**Table 6. Theories**

| Theory Name | Frequency |
| --- | --- |
| No Theory | 54 |
| Stimulus, Organism, Response (S-O-R) | 30 |
| Attribution theory | 5 |
| Expectancy-Disconfirmation theory | 3 |
| Grounded theory | 3 |
| Theory of consumer demand | 3 |
| Appraisal Theory | 2 |
| Cognitive appraisal theory | 2 |
| Congruity theory | 2 |
| Field theory | 2 |
| Gestalt theory | 2 |
| Information processing theory | 2 |
| Nature based solutions (NBS) | 2 |
| Role theory | 2 |
| Self-congruity theory | 2 |
| Signaling Theory | 2 |
| Theory of planned behavior | 2 |
| Assimilation–contrast theory | 1 |
| Attachment theory | 1 |
| Attention restoration theory | 1 |
| Attitude theory | 1 |
| Bottom-up spillover theory | 1 |
| Broke windows theory | 1 |
| Carlson's model on the aesthetics of nature | 1 |
| Categorization theory | 1 |
| Color-in-context theory | 1 |
| Congruence of background music (BGM) | 1 |
| Construal level theory | 1 |
| Cue utilization theory | 1 |
| Customer value theory | 1 |
| Customer-based brand equity | 1 |
| Elaboration likelihood model | 1 |
| Embodied cognition theory | 1 |

| | |
|---|---|
| Environmental psychology theory | 1 |
| Equity theory | 1 |
| Fractal Theory | 1 |
| Gender schema | 1 |
| Hall theory | 1 |
| Herzber''s theory | 1 |
| Hierarchy of effects | 1 |
| Human territoriality theory | 1 |
| Hunter–gatherer theory | 1 |
| Inference theory | 1 |
| Involvement Theory | 1 |
| Justice Theory | 1 |
| Optimum stimulation level (OSL) theory | 1 |
| Performance theory | 1 |
| Person-environment theory | 1 |
| Positive Affect and Negative Affect Schedule | 1 |
| Prospect-refuge theory | 1 |
| Self-identity theory | 1 |
| Servicescapes framework | 1 |
| Signaling theory | 1 |
| Social cognitive theory | 1 |
| Social exchange theory | 1 |
| Social facilitation theory | 1 |
| The schema theory | 1 |
| Theory of affordances | 1 |
| Theory of supportive design | 1 |
| Arousal Theory | 1 |

## 1.4. Research focus

Throughout the literature that was analyzed, 3 distinctive research settings/contexts were identified including (i) lodging, (ii) restaurants, (iii) casinos, as well as (iv) others, such as bars, night clubs, event areas, theme parks, and shopping areas. This section will focus on each of these different settings and further identify trends of physical environment research within. To better understand the flow of research further themes were identified within the larger contexts,

lodging area, and restaurants. These themes were extracted by using inductive content analysis (Kyngäs & Kaakinen, 2019).

## 1.4.1. *Physical environment in the lodging area*

Many of the studies analyzed in the current review have focused on customers' perceptions of the servicescape and physical environment in general. Servicescape was a major recurring theme throughout the studies. As presented in table 7, most studies took place in unidentified types of hotels (18), while the runner up are luxury hotel settings (14), followed by five-star hotels (5), resorts (5), and four-star hotels (4). These settings are important because it gives us an understanding of the areas that need more research, as clientele and the physical environment significantly different by the type of lodging.

**Table 7. Lodging types**

| Type | Frequency |
|---|---|
| Unidentified type of hotel | 15 |
| Luxury Hotel | 14 |
| Five Start | 5 |
| Resort | 5 |
| Four Star | 4 |
| B&B | 2 |
| Budget Hotel | 2 |
| Marriott chain | 2 |
| Airbnb | 1 |
| Business Hotel | 1 |
| Capsule Hotel | 1 |
| Eco-friendly Hotel | 1 |
| Hostel | 1 |
| Motel | 1 |

**Note*: One paper has been excluded from the table as it included 3 different types of lodging

For the physical environment in the lodging area the following recurring themes were extracted: satisfaction, quality, servicescape, ambience, green spaces/biophilic design, and design. These themes are important because they further explain the major focus of research in this category.

*1.4.1.1.Satisfaction*

Satisfaction was one of the most common outcomes of the identified studies. For instance, Gu and Ryan (2008) investigated the preferences and satisfaction of 941 Chinese clientele from 20 Chinese provinces in Chinese hotels. They identified the physical environment as a major contributor based on regression analysis and structural equation modeling as the main determinants of satisfaction with the hotel. Lin (2009) explored a hotel bar scenario by using Gestalt theory, where they concluded that novel and unique colors, as well as music that are in sync with the bar atmosphere, will enhance the customers' arousal level. Moreover, arousal level was used as a moderator, indicating that individuals with low arousal were more satisfied in a non-Gestalt (tranquil) bar than in a Gestalt (dynamic) bar. The study was designed as a two-by-two factorial between-subject design and collected data from 127 subjects that were recruited from various sources such as hotel employees, graduate, and undergraduate students from a northeastern university in the US.  Brunner-Sperdin et al. (2012) identified that flow experience, human ware (employees), and hardware (Design, Lighting effects, color effects, and sound effects) had a significant influence on the customers' emotional state which further positively affected their satisfaction level. The authors were interested in investigating the factors determining the service setting that enhanced the customers' emotional reaction in a high-quality hotel. Furthermore, data were collected in Austria, Southern Germany, and Italy, summing up to a total of 239 responses. Han et al. (2019) analyzed the internal (air quality, temperature, lighting, layout and furniture, plants, and pictures, etc.) and external (architectural style, exterior décor/signage, natural surroundings, etc.) hotel physical environment, concluding that both elicited emotional well-being, which in turn lead to the increased guest satisfaction and retention. Data was collected through a field study in six luxury resort hotels with a convenience sampling

approach in South Korea. Moreover, Ali et al. (2016) concluded in their study that service experience and emotions, jointly influenced customer satisfaction which in turn lead to price acceptance by customers. The service experience was measured as a formative construct consisting of three dimensions—physical environment (setting), interaction with customers (audience), and interaction with staff (actors). Data was collected from guests who stayed at Chinese resort hotels from three cities in China (i.e., Beijing, Xian, and Yinchuan) and analyzed using Structural equation modeling–partial least squares. Lastly, Sanchez-Fernandez et al. (2020) investigated consumer value and how their value dimensions influence satisfaction and loyalty. Data was collected in Spain, and a total of 285 questionnaires were valid. The purpose of the study was exploratory and PLS was used to analyze the data. Aesthetics and escapism were measured as reactive dimensions of value while play and ethics were measured as active ones. The results pointed out that reactive intrinsic values positively contributed to active ones, which in turn had a direct effect on satisfaction and loyalty.

*1.4.1.2.Quality*

The physical environment has also been studied in the context of quality, from the perspective of quality in the physical environment, and the physical environment being part of the overarching hotel and service quality. Juwaheer and Ross (2003) investigated the customers' expectations and perceptions of service offered by hotels in Mauritius. Using factor analysis with Varimax rotation the authors identified 39 service attributes from which 9 quality dimensions were formed. Moreover, SERVQUAL instrument was used to measure the service quality in hotels. Room attractions and décor factors were classified as new factors additional to SERVQUAL that positively impacted the service quality perception. Akbaba (2006) identified the physical environment, specifically room quality in business hotels, as a determinant of guest

satisfaction and repeat patronage. Data was collected from business hotels situated in a large city in the West coast of Turkey. Like the previous study the authors used an adapted/modified version of SERVQUAL. Kirilloca and Chan (2018) conducted their research through a scenario-based experimental design with 230 Chinese respondents. Data was collected based on the respondents' previous stay at a four- or five-star hotel. Their results showed that when a hotel projected higher aesthetic value, it is regarded as having superior physical facilities, and therefore can perform the promised services. Additionally, the visually appealing hotels also were seen more dependable by the guests as well as of higher quality. Kirilloca and Chan (2018) also used SERVQUAL instrument, focusing on physical facilities and the dependability of the service. Furthermore, Alexandris et al. (2006) investigated skiing resorts, collecting data from 264 recreational skiers. The purpose of their study was to measure the service quality, the contribution of place attachment on the contribution of customers' loyalty as well as the influence of service quality on the development of place attachment. The service environment quality (physical, social, and psychological). The physical environment dimension was found to significantly predict place attachment and place dependence. Hemsley-Brown and Alnawas (2016) investigated the extent to which service quality affected brand attachment (brand passion, brand affection, and self-brand connection). Data was collected from 355 respondents in the UK. The authors measured service quality as staff behavior and physical quality. In their results, the authors pointed out that physical quality had a stronger and more significant effect on customer brand attachment than the staff behavior. Han and Hyun (2017) discussed in their results that the quality of physical environment, service, and food affect guest'' satisfaction and intentions to revisit a luxury hotel restaurant and visit another restaurant in the same hotel. Korean luxury hotel restaurant customers were targeted, and a total of 308 responses were used in the analysis.

Wu et al. (2018) also investigated the physical facility quality regarding the achievement of green satisfaction in addition to environmental friendliness. The data used in the study was based on a sample of 517 customers staying at a green B&B in Taiwan. Their findings reveal that perceived experiential quality was formed by five dimensions (peer-to-peer quality, physical environment quality, outcome quality, venue quality and administration quality). Once these five dimensions achieve quality, they can positively achieve green experiential satisfaction in addition to environmental friendliness. While Channoi et al. (2018) in a beach resort hotel context and Clemens et al. (2010) in a motel context, identified physical environment as one of the tree primary dimensions, along interaction and outcome quality, to conceptualize service quality. Similarly, Walls (2013) also revealed that both the physical environment and the human interactions have a significant and positive relationship with perceived value. Data was collected from a variety of hotel market segments including select-service, mid-scale and upscale/luxury in the United States. The physical environment and human interaction had a positive emotive, cognitive, and social/self-concept consequence on the customers. In a later study, Zemke et al. (2018) investigated the effect of hotel design, navigability, and signage, on ADR, RevPar, and overall quality. The authors discussed in their results that the easier a property was to navigate the greater penetration in the competitive set 's availability room market, moreover, ADR was negatively influenced by a flexible hotel design. Data was collected from 480 hotel properties yielding 4995 responses. Furthermore Surucu et al. (2019) concluded that the surroundings, lobbies, guest rooms, and amenities all formed the physical quality of the brand. Their study was based on 918 hotel guests of 29 five-star hotels in 10 cities in Turkey. As with previously mentioned studies, the physical environment quality was measured as part of the service quality construct. Moreover, the service quality construct was further used as part of the items measuring

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customer-based brand equity. The research concluded that physical quality and personnel behavior had a significantly positive impact on customer-based brand equity. Similarly, Liu et al. (2020) concluded that the executive brand identity positively affected brand internalization, which in turn led to positive customer-based brand equity. Moreover, the executive brand identity positively influenced the physical facility quality, which in turn lead to positive customer-based brand equity. Their study introduced a multilevel model and collected 1978 employee and 925 executive responses from 62 upscale hotels in China. Jeaheng et al. (2020) evaluated the impact of service quality of halal-friendly hotels and their association among service quality attributes, perceived price, satisfaction, trust, and revisit intention. The physical environment was measured as part of the halal-friendly hotel performance quality. A total of 350 responses were collected in popular destinations in Thailand (Bangkok, Phuket, and Krabi) and analyzed using structural equation modelling. In their results the halal-friendly physical environment played a crucial role in achieving a high level of satisfaction among Muslim guests. Moreover, the halal-physical environment was not positively associated with perceived price of the hotel.

*1.4.1.3.Servicescape*

The servicescape was also a common theme in the selected articles. Nguyen (2006) concluded in their study that both service workers and servicescape have interactive effects on corporate image of the service provider. Data was collected from 409 hotel customers and 277 travel agency customers for upper-scale four-star establishment in Canada. The study reveals a curvilinear relationship with corporate image for service workers and a linear relationship for servicescape. Moreover, an exploratory study on luxury hotels was conducted by Walls et al. (2013), discussing the important role of the servicescape in perceived experience dimensions.

Data was collected in Oralndo, Florida, and the population evaluated were adult hotel travelers. The findings support that the design, facility upkeep, and physiological aspects of the physical environment impacted customers' hotel experience. Moreover, the findings also confirm the positive relationship between physical environment, human interaction, and perceived value. Lim (2014) identified the servicescape as being positively related to customer hedonism, which in turn affected both satisfaction and perceived value. A total of 400 responses were collected in Malaysia. Their findings confirmed that the servicescape significantly and positively was related to customers hedonism. Moreover, the servicescape and employee interactions crucially influenced customer consumption experiences in a resort context (Chang, 2016). Data was collected from both customers (519) and managerial employees (177) from a hot spring resort in Taiwan. The substantive staging of the servicescape, as perceived by customers, positively affected customers emotions. Moreover, the perceived communicative staging f the servicescape created an equivalent effect on customers' emotions. These findings suggest that the tangible faculties and the intangible services interact and by doing so create value for customers. In a different study Dedeoglu et al. (2018) discussed that staging the servicescape had a significant impact for hedonistic value perceptions of first-time tourists whereas emotional value is a more effective premise for re-visiting intentions of repeat visitors. Data was collected from hotel customers in Turkey. Results suggested that servicescape factors positively affect hedonic value perceptions, and hedonic value perceptions positively affect behavioral intentions. Similarly, Lockwood and Pyun (2019) show that the hotel servicescape significantly affected emotional and behavioral responses. Four elements of the servicescape were measures, namely aesthetic quality, functionality, atmosphere, spaciousness, and physiological conditions. Spaciousness, atmosphere, aesthetic quality', and physiological conditions, contributed to explaining both

pleasure and arousal, while spaciousness had the most significant impact on pleasure while aesthetic quality made the most unique contribution on arousal. Data was collected from five hotels in London that attracted both business and leisure travelers. Park et al. (2019) investigated two servicescape dimensions, namely communicative and substantive. Dara was collected from 150 participants that have patronized a luxury hotel in Spain. The results from PLS-SEM indicated that substantive servicescape and communicative servicescape have a positive influence on positive affect. Moreover, the effect has a positive effect on satisfaction which in turn increased behavioral intentions. Furthermore, brand familiarity significantly moderated the relationship between substantive servicescape and positive affect so much so that positive influence of substantive servicescape on positive affect was greater for participants with low brand familiarity than for those with high brand familiarity. Similarly, Li (2021) also concluded that substantive and communicative servicescapes have positive effects on customers' cognitive, affective, and behavioral engagements. Data was collected from Chinese domestic tourists that had stayed at a five-star hotel. Moreover, their results also pointed out that when customers experience pleasant physical and social hotel environments it tends to hotel-related thought processing, it pushes customers to engage with the hotel cognitively, affectively, and behaviorally. Bravo et al., (2019) included the servicescape as part of the service perception as a second-order factor and concluded that the emotions elicited towards an individual hotel influenced the customer response towards the hotel chain. Data was collected via telephone in Spain and yielded a total of 298 valid responses. The results showed that the service perceptions of an individual hotel determine customer satisfaction both directly and indirectly through the emotions created by the hotel experience. Song et al. (2020) empirically proved that the relationship between servicescape, emotions, perceived value and word-of-mouth were

significant, moreover, for health care travelers who stayed at an accommodation with a traditional interior design style, in addition to enhancing positive emotions of health care travelers, substantive servicescape significantly reduced their negative emotions. Lastly, customer engagement mediated the effects of physical and social servicescapes on customer citizenship behavior of providing feedback to an organization, while gender played a role on the indirect effects of three types of customer citizenship behavior. The study targeted health care travelers that used per-to-peer accommodations (i.e., Airbnb) and collected a total of 682 responses.

*1.4.1.4.Ambiance*

In the context of lodging, ambiance was also discussed by several authors. For instance, Suh et al. (2015) discussed in their results that multidimensional ambiance factors (air quality, temperature, odor/aroma, music, and noise/sound level) generate and influence the overall image, customer satisfaction, and loyalty intentions towards the hotel. Data was collected in South Korea from 422 five-star hotel customers. Moreover, this study also investigated the mediating effect of customer satisfaction on the relationship on ambient conditions and loyalty intentions as well as repurchase and word of mouth intentions. Customer satisfaction was a complete or partial mediator in the relationships between some ambient factors and loyalty intention factors. While Jani and Han (2015) affirm the effect of hotel ambiance on guests' consumption emotions as moderator by personality traits. Data was collected in South Korea from five-star hotel customers, a total of 563 useable responses were used for the analysis. The ambience had significant positive effects on the positive consumption emotion and a significant negative effect on negative consumption emotion. The positive and negative consumption emotions had positive and negative effects on hotel guest loyalty. Moreover, extraversion,

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openness to experience, and agreeableness as personality traits strengthen the relationships, with higher scores for the traits creating a stronger ambience-consumption emotions–loyalty relationships. Cetin and Walls (2016) point out that ambience space/function/amenities, design, signs/symbols/artifacts (physical environment) and interaction with staff and guests (social interactions) both impact guest perception and experience of a luxury hotel. Data were collected from 33 luxury hotels and 14 hospitality managers in Turkey. A total of 18 interviews were conducted with guests and 14 hotel managers and the data was analyzed using deductive and inductive approaches.

*1.4.1.5.Green Spaces/Biophilic Design*

Several articles have discussed the impact of plants, and other natural elements on consumers and employees. Cheng et al. (2016) explored the artistic servicescape, where a nature-based environment and nature-based layout, as well as signs and artifacts, played an important role in enabling the hotel to enhance its service capability and continually improve their services. Data was collected in three stages from multiple data sources: secondary data, 14 in-depth interviews, and transcription of the in-depth interviews. Lee (2019) discussed in their study that biophilic design in the hotel lobby elicited a stronger positive emotional response than non-biophilic design. This study was conducted as a scenario-based experiment, between-subject design, and collected a total of 246 responses. Three elements of biophilic design were investigated, namely, plants, water, and natural light. Biophilic design led to a stronger positive emotional response than non-biophilic design. Moreover, the presence of biophilic design not only significantly affected components of emotions and behaviors but also customers experience more arousal and pleasure. Moreover, the hotels that included biophilic design were considered to have superior quality. Similarly, Nanu et al. (2020)'s findings discussed that biophilic design

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in contemporary and outdated lobbies impacted the satisfaction and emotions of guests across different generations. This study was also set up as a scenario-based experiment and data was collected from 455 US basedUS-based participants. The lobby interior design styles significantly impacted booking intentions among different generations. Moreover, the addition of plants positively impacted satisfaction and emotion across all generations. While Han et al. (2020) and Han et al. (2019) discussed that nature-based hotel solutions significantly increased guest mental health perception and well-being. Han et al. (202) collected 317 responses in South Korea from hotel customers. The results of the study point out that green spaces within the hotel as well as outdoor natural environment significantly and directly impacted well-being perception and self-rated mental health, and indirectly affected satisfaction, affective commitment, and retention. While Han et al. (2019) investigated luxury hotels in South Korea and collected a total of 603 responses. Their findings point out that internal and external physical environments increase guest emotional well-being, which in turn contribute to building guest satisfaction and retention. In the context of B&B Cai et al. (2021) observed that the relationship between a green/healthy physical environment, well-being perception, tourist satisfaction, and tourist loyalty, led to a better understanding of how to support sustainable tourism recovery. The authors focused on East China and collected a total of 574 responses after the first wave of Covid-19. Their findings indicate that design-based strategies and design environmental value were the most relevant drivers of the promotion of green-based loyalty. Healthy indoor and outdoor environments were deemed important in green B&B construction and services.

*1.4.1.6.Design*

Quite a few articles investigated different elements of Bitner's (1992) servicescape model. Li et al. (2015) indicated in their study that decoration style had a critical role in

explaining Chinese customers' purchase intention. Specifically, a low conspicuous decoration style led to stronger customer purchase intention than did a high conspicuous decoration style. Two studies were conducted for this study in China on luxury hotels. A total of 67 respondents were collected for the first study while for the second study 211. Image perception acted as a mediating variable in study 2. The results revealed that image perception fully mediated the effect of decoration style on purchase intentions. Countryman and Jang (2006) identified three atmospheric elements (color, lighting, and style) to significantly relate to the overall impression of a hotel lobby, color was the most significant. A total of 102 responses were used for the analysis from various university faculty across the US. The objective of the study was to test atmospheric elements on guests' first impressions of a hotel lobby. Color was the most influential when it came to first impressions. Similarly, Siamionava et al. (2018) investigated the difference between two contrast hues with two levels of saturation and brightness in hotel room design. In their study the highest level of arousal was associated with a red hotel room, however, participants enjoyed spending time in a blue hotel room more. A Best Western Hotel Chain was used a sample for the hotel room to conduct the experiment. A total of 139 participants were recruited from a Midwestern University for the study. Heo and Hyun (2015) concluded in their study that when luxury amenities were placed in the room, customers' estimation of the room rate and their willingness to pay more for it increased. Three experimental settings were used for this study, and a total of 566 Chinese hotel guests were used in total. Bogicevic et al. (2017) analyzed the perceived servicescape of computer-generated images of hotel rooms, and identified guestroom aesthetics, layout, light, and furniture quality as factors of LODGSCAPE. Of these, two factors (aesthetics and layout) had significant and positive effects on customer satisfaction. The study was set up as a sequential exploratory mixed method design. Two studies were

undertaken with 20 US guests for the first one and 762 guests for the second study. In a follow-up study Bogicevic et al. (2018) investigated age and gender as a moderator for hotel guest satisfaction and room design style. Younger guests prefer contemporary design styles, while older guests show equal satisfaction with traditional and contemporary styles. Male guests prefer rooms decorated in masculine colors, while women are equally satisfied with masculine or feminine color schemes. The study was designed as a virtual scenario-based quasi-experiment and used a sample of 150 students from two US universities. Lv et al. (2019) investigated the home-like feeling of AirBnB, leading to a sensory experience for the customers. The study was set up in two stages collecting online reviews and setting up two experiments to analyze the proposed hypotheses. A total of 3479 participants were recruited. Enthusiasm and hospitality were found to help create a better sensory experience for customers. This study showed that only genuine service enthusiasm and hospitality help create a home-like feeling for the customer.

While Choi and Kandampully found that social and room design were antecedents to customer satisfaction. The study was set up in the context of luxury hotels of at least four stars and data was collected in the US from 472 customers. Their findings indicated that each atmosphere factor contributed differently to customer satisfaction. Moreover, the room design factor had the greatest impact on satisfaction, followed by the social factor. Additionally, neither the public space design nor the ambiance factor contributed to customer satisfaction in this study. Furthermore, Bengwal and Tiwari (2019) were the one of the only studies to look at employee perspectives, concluding that workplace design in hotels positively influences employee's intent to stay through job satisfaction. Data was collected from 311 LEED-certified hotel employees in the UK. Verissimo and Costa (2019) investigated the symbolic meaning of hostel design, revealing that the hostel experience is more symbolic than utilitarian meaning. The study used

ethnography, concentrating on five top-rated hostels. The study concluded that guests appreciated when the design of the hotels was beautiful for functional. Moreover, the results also suggest that there is a link between the positive experience of the gust and the hostel environment. Chen et al. (2020) investigated capsule hotels, suggesting in the findings that optimum stimulation level had a positive effect on experiential value and perceived risk. Data was collected using a snowball effect from 276 capsule hotel travelers. Aesthetic playfulness scored the lowest in their study, indicating that the sensations of playfulness that were experienced during the stay were not as good as expected. Lastly, Lee (2020) positive design in hotels. Corporate social responsibility to the environment, escapism, and compatibility positively influenced customers' well-being. A total of 307 responses were collected in the USA from customers who previously stayed at a Marriott property.

### 1.4.2. The Physical environment in Restaurants

Like the studies that used a hotel setting, the studies that focused on restaurants also considered satisfaction as an outcome. As presented in Table 8, most studies were conducted in Unidentified Type of Restaurants (20), followed by Asian Restaurants (14), and full-service restaurants (8), and ethnic restaurants (7). The other types of restaurants were relatively scarce.

**Table 8. Restaurant types**

| Type | Frequency |
|------|-----------|
| Unidentified type of restaurant | 20 |
| Asian Restaurant | 14 |
| Full-service restaurant | 8 |
| Ethnic Restaurant | 7 |
| Casual Dining | 4 |
| Fine Dining Restaurant | 3 |
| Luxury Restaurant | 3 |
| Upscale Restaurant | 3 |
| Fast Casual Restaurant | 2 |
| Open Kitchen Restaurant | 2 |
| Theme Restaurant | 2 |
| Italian Restaurant | 1 |
| Pizzeria | 1 |
| Traditional Restaurant | 1 |

*1.4.2.1.Satisfaction*

Satisfaction was found predominantly in restaurant-related studies as an outcome of the physical environment. Based on previous literature Han and Ryu (2009) investigated the physical environment in restaurants by using three factors, namely décor and artifacts, spatial layout, and ambient conditions; concluding that they strongly influenced how customers perceived price which in turn enhanced customer satisfaction. A total of 279 responses were collected through a survey in the USA. Moreover, décor and artifacts were the most significant predictors of price perception. Ryu and Han (2010) discussed in their results that the quality of the physical environment, together with the quality of food, and service, significantly determined customer satisfaction. Data was collected from 341 participants in the USA. Moreover, the results indicate that when customers feel that the physical environment reflects quality, then the satisfaction level increases as well. Additionally, the perception of reasonable prices also increased the effect of the quality of the physical environment on their satisfaction in quick-casual restaurants. Ryu et al. (2021) investigated customer satisfaction in the context of Chinese restaurants. A total sample size of 300 customers was collected in the US from 42 Chinese restaurants. The quality of the physical environment was a significant determinant of restaurant image, which in turn. Influenced customer satisfaction and behavioral intentions. Similarly, While Zhang et al. (2013) expressed in their results that the influence of the physical environment on customer satisfaction is most likely to be moderated by regional factors. A total of 30,893 customer reviews from 52 cities in China were analyzed. The study targeted quick-service restaurants. The results indicated that the region negatively moderated the influence of the physical environment on customer

satisfaction. In a different study Kim and Lee (2013) discuss in their findings that the physical environment alone did not influence either gratitude or satisfaction in restaurants. The study was conducted with 413 guests of an upscale restaurant in Seoul, Korea. The relationship between perceived quality and satisfaction, service quality, and food quality considerably reduced satiation levels, whereas physical surroundings were associated with an increase in satisfaction (Park & Jang, 2014). The study was conducted in the US with 531 general restaurant customers. Song and Qu (2017) measured the hedonic value of visiting a restaurant by looking at interior design, music, mood, and layout, demonstrating in their results that hedonic value only indirectly affects customer satisfaction through positive emotions. Data was collected from 435 American customers who have diner at Asian restaurants. Byun and Jang (2018) explored how the kitchen design affected causal attribution of blame for service failure. Data were collected from 110 customers and the study was set up as an experiment. Customers' behavioral intentions were found to differ significantly between open- and closed-kitchen restaurants. Both customer satisfaction and behavioral intentions were influence by the interaction with the kitchen design and service failure through the mediation of causal attribution. Moon et al. (2020) focused on solo dining, and in their results, they showed that restaurant physical and psychological boundaries positively influenced perceived territoriality, leading to positive solo dining satisfaction and revisit intention. The survey collected a total of 300 participants who have dined in five Korean casual dining restaurants. Lastly, Buin and Jang (2020) investigated the perception of open kitchen design in restaurants, the findings demonstrating that open kitchen design is perceived as a negative signal for noise and smell but not as a positive signal for food hygiene and food quality. A total of 278 responses were collected from open kitchen restaurants in the US. Furthermore, the results pointed out that the kitchen design acted as a negative signal

regarding noise and smell, however, it signaled food hygiene and quality. In terms of

satisfaction, customer showed less satisfaction and intention to revisit when there was a loud

noise in the kitchen as opposed to closed kitchen restaurants.

*1.4.2.2.Quality*

Quality was an important factor in many studies in the restaurant setting. Kim et al.

(2006) measured the physical environment as part of the tangible aspects of a luxury restaurant,

discussing in their results that the physical quality significantly impacted the relationship quality.

A total of 887 customers from luxury restaurants in Seoul, Korea participated in the study.

Physical quality and food quality were measured as tangible antecedents of relationship quality

and were proven to be weaker predictors than intangible antecedents. Namkung and Jang (2008)

aimed to identify the quality attributes that distinguish between highly satisfied diners and non-

highly satisfied ones. Data was collected from 287 full-service restaurant customers in the US.

The study indicated that spatial seating arrangement fascinating interior design and pleasant

background music were important attributes in contributing to the high satisfaction of diners.

Similarly, Oubre and Brown (2009) measured aspects of the physical environment as part of

tangibles, leading to the overall quality of service. Data was collected from 266 participants that

have visited three fine-dining restaurants in the USA, 12 managers, and 43 wait staff. Similarly,

Nam and Lee (2011) also measure the physical environment as tangibles and concluding that

intangibles, tangibles, and food were part of the three dimensions of service quality, as well as

positively influenced satisfaction. Barber et al. (2011) analyzed if a correlation exists between

physical environment service quality attributes and repeat patronage. Results indicated decisions

to return were based upon cleanliness attributes. A total of 280 customers of full-service

restaurants were used for the study, and data were collected from the US. Jeong and Jang (2011)

investigate university dining atmosphere as part of the restaurant experience, leading to positive eWOM motivation, concluding that superior atmosphere in restaurants elicited positive eWOM motivated by a concern for others. A total of 201 responses were used for the data analysis, from students in the US. The customers' pleasant experience with the atmosphere of the restaurant served as a motivation to spread positive eWOM due to concern about others. Perceived quality of the surrounding space, including the attractiveness of the interior design and décor of the restaurant, a clean environment, and neat and well-dressed employees affected the customer's behaviors and emotional state after the experience, leading to post-dining behaviors. Hwang and OK (2013) researched the consequence set and consequences of consumer attitudes toward restaurant brands, discussing that the physical environment quality had a significant effect only on hedonic attitudes. The study evaluated several different types of restaurants, using a total of 310 responses for fine dining, and 324 for casual dining. The physical environment quality had a positive influence on interactional and outcome qualities. Moreover, the interactional quality had a positive effect on the outcome quality. Ryu and Lee (2012) examined the restaurant quality, relationship benefits, and customer reciprocity from the perspective of relationship marketing investments. In their results food quality and price fairness had less significant roles in developing customer relationship marketing investment perception compared with service quality and physical environment. Data was collected from Chinese restaurants located in the US, a total of 300 responses were used for the analysis. Prayag et al. (2019) pointed out in their study that the physical environment was not a significant predictor of relationship quality. Data was collected from 300 casual dining customers in Malaysia. In a different study by Prayag et al. (2020), the authors examined how knowledge, physical environment, and service quality influence co-creation within the culinary tourism context. Data was collected from 575 domestic

tourists who participated in cooking classes. Prior knowledge impacted the tourists' reflective and recreational motive to participate which shaped how they evaluated the physical environment and service quality.

*1.4.2.3.Servicescape*

Servicescape played a major role in several articles that studied the restaurant's physical environment. Namasivayam and Mattila (2007) investigated the effects of a service exchange on consumers' satisfaction after considering the effects of the servicescape. A total of 203 student responses were collected for the analysis. The study was set up as a factorial experiment, where the participants were presented with a written scenario that simulated a real-life situation. The results indicated that servicescapes had an important effect on customers' mood states. Moreover, age had a significant effect on levels of satisfaction. Verhoeven et al. (2009) conducted two scenario experiments and found in their results that environmental cues served as a means to establish the servicescape and reinforced the desired price image. Data was collected from 282 students from the Netherlands for both scenarios. Kim and Moon (2009) investigated how the servicescape influences perceived quality, pleasure-feeling, situational factors, and revisit intention. Data was collected in Canada from 2020 theme restaurants. The results indicate that stimuli from the servicescape influence the service quality, which in turn indirectly affects customers' behaviors. Lin and Mattila (2010) examined the impact of the servicescape on customers' emotions and satisfaction. The study had a mixed-method approach, customers were interviewed with open-ended questions and a survey was conducted as well. A total of 479 customers participated in the survey, and data was collected from a Japanese Restaurant in Taiwan. The results pointed out what both the servicescape and service encounter influenced customer pleasure and satisfaction. Moreover, perceived congruency had a positive impact on

pleasure level, while the impact of arousal was minimal Perceived congruency and pleasure had a joint impact on satisfaction. Wang and Matilla (2013) also investigated the servicescape in the context of Chinese restaurants. The purpose of the study was to investigate the dimensions of the servicescape and their impact on consumers' prepurchase authenticity perceptions and patronage. Data was collected from 274 US customers and 275 Chinese customers. The findings revealed that the servicescape dimensions can induce pre-consumption authenticity perceptions. Moreover, the dimension cues interplay to effects authenticity assessments. In a different study, Chen et al. (2015) investigated how clarity, self-efficacy, purchase importance, and the servicescape influence mandatory customer participation in a full-service restaurant. Data was collected from 386 customers in the US. The results pointed out that the exterior servicescape displayed a moderately significant relationship with information participation, however, no relationship attitudinal or actionable participation. On the other hand, interior servicescape had no impact on information nor actionable participation, however, it displayed a moderate effect on attitudinal participation and customer loyalty. Im and Qu (2017) explored customer co-creation by integrating drivers and resources that promote customer co-creation. The study was set up as a scenario-based survey and collected a total of 501 full-service restaurant customers in the US. The perceived physical environment was positively related to self-efficacy and motivation, when the physical environment was perceived more favorable customers were motivated to participate in the co-creation experience. Moreover, the effect of the perceived physical environment on motivation is greater than that on self-efficacy. Meng and Choi (2017) investigated the quality-of-life model in a theme restaurant context. A total of 381 theme restaurant customers in China participated in the study. Based on their results servicescape along with customer emotions, satisfaction, and perceived authenticity was utilized towards their restaurant customers' quality of

life evaluation. Meng and Choi (2018) examined restaurant customers' decision-making process in light of the theory of planned behavior model. A total of 357 responses were collected in China from theme restaurant customers. The findings imply that the external formation process of behavior is explained by the servicescape–attitude–intention linkage. Moreover, restaurants with specific themes exert significant influences of the servicescape on attitude-behavior. In a separate study Line et al. (2018) investigated the effects of other customers on consumption behavior in a restaurant environment. Data was collected from 1094 customers in the US. The results identified that the mere presence of others in addition to traditional identified aspects of the servicescape impacts individuals' perceived feelings of attachment to the restaurant. Moreover, this effect took place via the mediating effect of company identification. In another study, Poria et al. (2019) investigated through a qualitative study obese participants, total of 36 participants in the US were interviewed, with open-ended questions. The participants identified the servicescape as an important role in shaping their restaurant experience. Moreover, issues related to the interaction between the participants' bodies and the physical environment were pointed out. Specifically sitting did not accommodate their body size, leading to a sense of shame and humiliation. Moreover, the difficulties associated with the servicescape also led to a sense of frustration and discrimination. Song et al. (2019) investigated the social factors of the servicescape in the context of ethnic restaurants in the US. A total of 220 customers were recruited for this study. The results pointed out that the congruity between employees' ethnic background and the theme of the ethnic restaurant positively affected the customers' intentions to purchase or spread positive word of mouth. Moreover, the customers' perceived authenticity was also positively impacted. Apaolaza et al. (2020) examined the effects of natural plants on satisfaction and loyalty in a casual restaurant in the US. A total of 119 customers participated in

the experimental study. Indoor plants had a positive and significant effect on satisfaction and loyalty, mediated by the experiential value components of aesthetic value, service excellence, and escapism. Chao et al. (2021) also investigated ethnic restaurants in Taiwan. A total of 591 customers participated in their study. The study explored the influence of servicescape on consumers' word-of-mouth intentions using the stimulus-organism-response framework. The results indicated that servicescape influenced experiential value, which in turn affected the customer's emotions and generated word-of-mouth intentions. Moreover, authenticity as a moderator weakened the impact of substantive staging on experiential value. Additionally, the interaction between substantive and communicative staging weakened the impact of the servicescape on experiential value.

*1.4.2.4.Atmospherics*

Atmospherics was a recurring theme within the restaurant setting. Gueguen and Petr (2006) investigated the odors and consumer behavior in restaurants. An experiment was carried out in a small pizzeria in France, where lemon scent and lavender scent were dispersed as opposed to no scent. A total of 30 participants participated in the survey for no-odor, 20 for lemon, and 30 for lavender. The results confirmed that scents had an impact on restaurant consumers' behavior. Lavender scent positively impacted the amount of time spent and money spent in the restaurant, while the lemon scent was found to have no effect on both. Ryu and Jang (2007) investigated how customers' perceptions of dining in upscale restaurant environments influence behavioral intentions. Data was collected from 253 participants in the US. Based on structural equation modeling analysis, facility aesthetics, ambiance, and employees had a significant effect on the level of customer pleasure. Moreover, arousal was significantly influenced by the level of arousal. Pleasure appeared to be more influential on emotions.

Magnini and Thelen (2008) tested the influence of music on consumers'' perceptions of brand personality, décor, and service quality in a laboratory experiment. A total of 66 undergraduate students were used for the experiment, setting the scenario as a fine dining restaurant. Findings indicate that music does have an influence on perceptions of brand personality and décor but does not appear to have a significant impact on perceptions of service quality. Rahman (2009) adopted a grounded theory approach to examine restaurant décor. The study focused on Italian restaurants located in Manhattan, USA. A total of 243 restaurants were included in the analysis. The results indicated that age and competitive intensity are negatively associated with décor, and competitive intensity exacerbates the extant negative association between age and décor. Lu and Liang (2009) also investigated luxury restaurants located in hotels. A total of 392 customers participated in the study in Taiwan. The results indicated that restaurant environment factors, interactions with the service employees, and other consumers, positively influenced customer satisfaction through experiential value. Liu and Jang (2009) examined the relationship among dining atmospherics, emotional responses, perceived value, and behavioral intentions in Chinese restaurants. A total of 348 questionnaires were collected in the US. Dining atmospherics had a significant effect on customer positive and negative emotions as well as perceived value. In a different study, Ha and Jang (2010) investigated the role of customer atmospherics in an ethnic restaurant, moreover, the relationship between perceived quality and satisfaction as well as loyalty was examined. Data were collected from American customers of casual-dining Korean restaurants. A total of 607 responses were used for the analysis. Atmospherics was used as a moderator, and the study found that good employee service can be more effective in increasing satisfaction and loyalty for customers with a low perception of atmospherics as compared to those with high perception. Moreover, when atmospherics were not satisfactory, food quality

played a critical role in creating customer satisfaction with the restaurant. Ryu and Han (2011) investigated how atmospherics influenced disconfirmation, customer satisfaction, and customer loyalty for the first time and repeat customers in upscale restaurants. Data was collected from 310 participants in Seoul, Korea. The results indicated that facility aesthetics, lighting, layout, and service staff significantly affected disconfirmation, moreover, the disconfirmation was significantly different from first-time customers and repeat ones. Fatimah et al. (2011) investigated hygiene factors in restaurants from the customers' perspective. A total of 265 customers were recruited for the study from Chinese and Indian restaurants. The results foodservice hygiene was one of the top three considerations when selecting a dining place. Moreover, a confirmatory factor analysis indicated that scent aspects were part of a four-factor model. Jang et al. (2011) investigated how authentic atmospherics affected customers' emotions and behavioral intentions in Chinese restaurants based in the US. Data were collected in the US from 348 respondents of a full table service restaurant. The findings revealed that authentic atmospherics significantly influenced consumers' positive and negative emotions. Moreover, both types of emotions acted as full mediators between authentic atmospherics and behavioral intentions. Additionally, menu presentation, furnishing, and music were significant predicators of positive emotions while menu presentation and music of negative emotions. Heung and Gu (2012) investigated the influence of restaurant atmospherics on the dining satisfaction and behavioral intentions. Data was collected from full-service restaurants in Hong Kong, China A total of 118 responses were used for the analysis. Restaurant atmospherics had a significant influence on customer satisfaction and behavioral intentions. Intention to return and the spread of positive word of mouth as well as willingness to pay more where of interest. In a different study, Jang and park (2012) intended to identify the dining factor of an ethnic restaurant and how they

influence customers' emotions, perceived value, and future behavioral intentions. A total of 517 non -Korean customers evaluated full-service Korean restaurants in the US. The results uncovered that food quality, atmospherics, and authenticity of the food and the dining environment significantly induced customer's positive emotions. Line et al. (2012) researched homophily in fine different restaurant settings. A total of 1220 customers participated in the study in the US. The results indicated that social capital is a factor part of atmospherics. Moreover, homophily gave customers a significant meaning during dinner and later evening hours as well as fine dining venues. Hyun and Kang (2014) investigated luxury restaurants. The authors examined the impact of environmental and non-environment cues on customers' emotional responses as well as the influence of emotions on behavioral intentions as moderated by motivational orientation and hedonism. A total of 379 luxury restaurant patrons based in the US participated in the study. The results revealed that both environmental and non-environmental cues induced arousal, with environmental cues having a stronger impact. Additionally, ambient conditions were found to be the most powerful elements to drive arousal. Prayag et al. (2015) investigated the relationship between service quality, food quality, and restaurant atmospherics as perceived quality and positive emotions, behavioral intentions. Data was collected from casual dining restaurants in France, and a total of 211 customers participated in the study. Positive emotions had a strong influence on behavioral intentions, while service quality, food quality, and restaurant atmospherics are all linked to positive emotions. In a different study by Peng et al. (2017) investigated restaurant stimuli on diners' emotions and loyalty to teppanyaki restaurants. Data was collected from 308 participants located in Taiwan. The results indicated that other diners and the restaurant atmospherics only affected the negative emotions of diners. Moreover, both positive and negative emotions influence loyalty intentions.

Ogilvie et al. (2018) investigated the impact of Feng Shui in Chinese restaurants. The authors adopted an interpretivist epistemology approach and conducted a total of 20 interviews with restaurant managers. The results indicated that the Feng Shui practices have a significant impact in managing the servicescape as well as influencing the decisions and behaviors of proprietors. Ribeiro and Prayag (2018) investigated ethnic restaurants and analyzed the three dimensions of service quality and emotions on the overall customer experience in ethnic restaurants. Data was collected in the UK from 688 Brazilian ethnic restaurant customers. The results indicated that atmospherics had a positive influence on positive emotions, however, they did not have a negative influence on negative emotions. Tantanatewin and Inkarojrit (2018) investigated the emotional response to interior color on restaurant entry decisions. A total of 496 customers from the US participated in the study. The findings indicate that light pink and orange colors received high scores for pleasure increasing the chances of customers to enter. The effect of the colors was analyzed using The Pleasure-Arousal-Dominance (PAD) Emotion Model. Wen and Leung (2020) also investigate ethnic restaurants. The study analyzed the influence of background music on customers' perception of ethnic restaurants. A total of 346 responses were collated from various ethnicities. The results indicated that the congruency between ethnic music and restaurant theme showed more significant effect on perceived authenticity than the enjoyment of music itself. Moreover, perceived authenticity had a significant positive effect on satisfaction and behavioral intentions. Additionally, the effect of music enjoyment on perceived authenticity was higher for customers who dined with families, while music congruency was higher for customers who dine with friends. Taylor (2020) investigated customer sitting preference in light of re-opening after the COVID-19 pandemic. Data was collected from 324 customers in the US. Respondents indicated that partitions between tables were preferred to mannequins being placed

at tables. Chen et al. (2020) examined the role of nostalgia in influencing customers' loyalty intentions in traditional restaurants in China. A total of 1082 customers were recruited in China for the study. The results indicated that restaurant food, environment, and service, played an important role in triggering nostalgia, which later on impacted perceived value and loyalty intentions. Lastly, Im et al. (2021) examined the influences of openness to experience and the perceived physical environment on customers' intention to participate in a co-creation experience. Dara was collected from 555 customers of full-service restaurants in the US. The results indicated that customers who scored high on openness to experience were more likely to participate in co-creation, and perceived physical environment did not influence the intention directly. However, the mediating role of positive anticipated emotions was significant between the perceived physical environment and the intention and between openness to experience and the intention. Wu et al. (2021) explored lighting designs on customers' approach intentions toward restaurants. A total of 576 customers from the US participated in the between-subject experimental design. Focal light as opposed to dimmed light positively affected the perceived attractiveness and visit intention among high relationship customers as opposed to low ones. Moreover, when general lighting is dim but not bright, ambient intimacy mediates the effect of focal lighting presence (vs. absence) on restaurant's perceived attractiveness and restaurant visit intention, with the mediation path more profound among diners that have high (vs. low) relational intimacy.

### 1.4.2.5. Crowdedness

Environmental psychology research points that crowding illustrates how the physical environment may affect human behavior. Tse et al. (2002) investigated how the perception of crowded restaurants could be attributed to high food quality, good reputation, and low food

prices. Data was collected in Chinese restaurants located in Hong Kong. A total of 300

customers participated in the study. The results confirmed that crowded restaurants were

associated with high food quality, good reputation, and low food price, while quiet restaurants

were associated with the opposite. Kim et al. (2009) investigated the difference between

American and Chinese perceptions concerning congestion attributed to crowded restaurants.

Data were collected both in the US and China, and a total of 59 Americans and 44 Chinese

customers participated. The results pointed out that cultural differences existed between the two

countries when it comes to congestion and customer attribution. Chinese customers evaluated

crowdedness based on spatial factors while Americans were more sensitive to the number of

people in the given space. Moreover, Chinese customers attributed crowdedness to better food

quality and reputation whereas Americans showed the opposite position. Hwang et al. (2012)

analyzed the effect of crowding in a waiting environment. The study was set up in a virtual

reality simulation, and data were collected from 61 students based in the US. Crowding was

found to have a significant impact on arousal and dominance, but not in pleasure and approach-

avoidance responses. Moreover, the desire for privacy moderated the relationship between

crowding and affiliation. Hanks et al. (2017) investigated how density in the servicescape

affected three interpersonal dimensions. A total of 336 responses were collected from the US.

The results indicated that customers were confident in the serving abilities to be adequate in high

density for fine dining and sports bar conduction. In contrast, family casual restaurants reported

the same results when the density was low. In a different study Line and Hanks (2020)

investigated the impact of the physical, employee, and customer servicescape simultaneously in a

fast-casual restaurant context with crowding as a moderator. Data were collected in the US from

1110 participants. The results indicated that crowdedness acted as a moderator in the context of

customer servicescape. The customer servicescape was a determinant of satisfaction only when the restaurant is perceived to be crowded. Lastly, Wang et al. (2021) analyzed the effects of crowdedness and in-restaurant safety measures on customers' patronage choices during COVID-19. A total of 593 US consumers and 591 Australian customers participated in the study. The study was set up as an online experiment to simulate the scenario. The results indicated that US customers were more sensitive to crowdedness, whereas Australian customers were more sensitive to different safety measures.

### 1.4.3. *Physical environment in Casinos*

The casino setting was the third most popular throughout the research articles. Zemke and Shoemaker (2007) explored the effect of ambient scent on social interactions; their results pointing out that ambient scent has a significant and positive influence on the behavior of guests. A focus group was established in Las Vegas, Nevada, to conduct the experiment. A total of 77 participants were recruited. The results indicated that pleasant ambient scent, essential oil of geranium in this experiment, had a positive effect on increasing the interaction behaviors of participants in an environment where participants do not know each other. Moreover, the number of interactions was increased by 52% on a per-participant basis. Yi and Busser (2008) identified the gaming value and environment as the top factor affecting re-patronage intentions and willingness to recommend. Data was collected in Las Vegas, Nevada, and a total of 382 responses were used for the analysis. The study conducted a factor analysis to identify important casino attributes for re-patronage intentions. Their results were heavily supported by previous studies as well. In a different study Wong and Fong (2010) concluded that the service environment and the service delivery are significant predictors of customer satisfaction, however, not every service value proposition is necessarily important to the referenced customer

satisfaction. Based on two studies of Chinese casino players, and a total of 238 customers for the first study and 224 for the second study were recruited. The results point out that in addition to the physical service environment, supplementary services such as "place" and interpersonal interactions are also important. Overall, the participants considered the game service essential to the gambling experience. In a similar study, Lam et al. (2011) indicated that the overall servicescape dimensions showed a significant impact on gamblers' cognitive and effective satisfaction. Data was collected from 513 gaming customers in Macau, China. Customers were satisfied when gambling in an attractive physical environment controlling for the betting outcomes and overall gaming results. While Rose and Penny (2011) indicated that the servicescape (or service environment, including floor layout, cleanliness, lighting, etc.) of the slot areas has little impact on Chinese gamblers' behavior. The study adopted a mixed research approach, with 259 Chinese casino customers and 51 casino employees. Wong et al. (2012) discussed that both male and female leisure players and male hardcore players think of the service environment as the most important dimension of casino service quality. The study proposed the CASERV as a comprehensive instrument in measuring casino services. A total of 238 responses were collected from Macau, China. In a similar study also Wong et al. (2012) identified that the service environment was one of the four casino service facets influencing the service quality evaluation. The study used the CASERV scale to evaluate the aspects of the casino service, collecting a total of 145 leisure gamblers and 93 hardcore gamblers in Macau, China. While Wong (2013) explored the customer equity and the role of service experience in the casino service encounter, pointing out in their results that service experience is driven by four first-order factors: the service environment, employee service, service convenience, and hedonic service. Data was collected through 47 in-depth interviews as well as a questionnaire with 274

responses, in Macau, China. The study concludes that the service environment plays an experiential role in the casino experience. Prentince et al. (2016) concluded in their study that the casino service environment influenced impulse gambling, even more so when brand equity was present. Data was collected in Macau, China, and a total of 530 participated. The results confirm that impulsive gambling can be triggered by the tangibles in the casino physical environment. The tangibles include internal and external cues such as architectural design, interior décor, lighting, ambiance, as well as other servicescape elements. Lastly, Ho et al. (2019) discussed in their results that the customers' servicescape evaluation is positively associated with their perceived internal and external control, however, no indirect effect of casino servicescape on unplanned gaming behaviors through perceived external control was found. Data was collected in Macau, China, and a total of 559 responses were collected. The results indicate that a well-designed casino environment enhances customers' perceived internal and external control. Moreover, the casino servicescape induces customers cognitive and emotional responses which in turn leads to customer gaming behaviors.

### 1.4.4. *Physical environment in Others*

### 1.4.4.1.Airports

Airports were very scarce researched within the time frame and journals picked. Han et al. (2020) investigated the green physical surroundings in airports concluding that there is an association with emotional well-being and green place attachment, ultimately building the travelers' intention for green behaviors. This study used an exploratory sequential mixed method design, and data was collected from 350 respondents who have visited an airport in the past six months. Their study successfully identified how green physical surroundings, emotional well-being, and green place attachment induced travelers' decision or willingness to adopt green

behaviors such as recycling, reducing waste and water consumption as well as green purchase behaviors.

### 1.4.4.2.Cafes and Coffee Shops

Several studies investigated cafes and coffee shops and their impact on the physical environment. Tumanan et al. (2012) revealed that the physical and social dimensions defined the customers' attachment to the coffee shops. Data were collected through two focus groups, interviews, as well as questionnaires. A total of 272 respondents participated in the questionnaire in the Philippines. Proper lighting, comfortable furniture, spacious and airy layout, and even the presence of reading materials created a positive effect on the respondents' food and beverage consumption and length of stay in the coffee shops. Jeon et al. (2016) researched background music in coffee shops, concluding that patrons experienced a positive mood, and in turn, showed an approach behavior represented by spending more money and time. Two studies were conducted for this research, study one collecting 117 students filled questionnaires while study two 243 customers questionnaires in South Korea. Background music was explored as a co-creation in boosting patron's approach behavior and concluded that not only it made patrons stay longer in the establishment, but also to spend more money. Ambiance as part of the café experience was investigated by Zhang et al. (2019), concluding that intangible attributes weigh more than tangible ones. Data was collected in New Zeeland from 205 participants. Intangible attributes such as service quality and ambiance were considered more important in terms of value for money, customer satisfaction, and loyalty intentions. Moreover, coffee quality, service quality, and ambiance were identified as significant antecedents of customer satisfaction. Similarly, Lim et al. (2020) also investigated ambiance in Cafes, the results showing that ambiance and social interactions positively shaped the customers' intentions to patronize

traditional coffee operations. Data was collected from 363 participants in Malaysia. The results indicated that customers may not consider all the ambiance conditions as significant, however, the ones that are considered significant do positively affect intention to patronize. Cleanliness and furnishings played an important role in creating ambiance. Moreover, ambiance and social interactions also negatively affected customer patronize intentions, specifically when elements of the ambiance deteriorated due to overuse.

*1.4.4.3. Bars and Nightclubs*

In the setting of bars and nightclubs, the servicescape was a major focus. Both Skinner et al. (2005) and Kubacki et al. (2007)'s findings indicated the various servicescape elements prompted the customer to enter the establishment for the first time as well as re-visit intentions. Skinner et al. (2005) conducted a mixed-method study with two focus groups and a survey with students in a UK campus. Results pointed out that spatial functionality and layout of the nightclub and bar servicescape was particularly important to the participants. Moreover, music was the key attractor. Kubacki et al. (2007) also collected data from university students in the UK and Poland. The results pointed out that the décor of nightclubs and pubs play a significant role in return intention, like the previous study respondent had a particular preference for spatial functionality and layout. Lin and Worthley et al. (2012) used Gestalt versus Non-Gestalt servicescapes to moderate the relationship between arousal-seeking tendencies and emotions, concluding that pleasure enhanced satisfaction while satisfaction enhanced approach-avoidance behaviors.  Data was collected from 261 participants in the US. Olson and Park (2019) investigated LGBT servicescape cues, and how they affected gay customers' cognition, perception, and behaviors, concluding that the perceived LGBT-friendliness of the bar mediated the positive effects of the stimuli on behavioral intentions. The study was designed as an

experiment and investigated 109 gay males in the US. LGBT servicescape cues positively affected gay customers' cognition, perception, and behaviors about the bar. While LGBT-friendliness of the bar mediated the positive effects of the stimuli on behavioral intentions. Moreover, the physical and social LGBT cues resonated better with the older age cohort than the younger ones. In a different setting Martin et al. (2019) developed a pubscape for breweries in the UK, extending the servicescape, while Thomas et al. (2018) concluded that the winescape influenced satisfaction with the wineries.

*1.4.4.4.Cruises*

Cruises were also relatively under-researched. Lyu et al. (2017) concluded in their study that cruise operations can enhance perceived servicescape by including natural and built environments. The study was conducted through a mixed-method approach, collecting 18 in-depth interviews, an expert panel of 5, 317 participants for an on-site survey, and 300 participants for an online survey. The concluding remarks point out that an ideal cruise servicescape should be physically appealing, socially supportive, symbolically welcoming, and naturally pleasing. Moreover, Chinese cruise tourists preferred tangible elements over intangible ones. While Ahn and Back (2019) revealed that the relative effects of sensory, affective, behavioral, and intellectual factors had a significant effect on perceived functional and wellness values. Data was collected from 389 US cruise customers. Sensory and intellectual experiences involve functional and wellness values in the cruise setting, which significantly affected customers' satisfaction and behavioral intention. Calza et al. (2020) suggested in their findings that the onboard environment was a good predictor of behavioral intentions, and the relationship was strongly mediated by satisfaction and perceived value. A total of 417 questionnaires were collected from US cruise customers. The results pointed out that the physical environment was

perceived as a one-dimensional experience of the ships' overall experience. Moreover, the onboard environmental stimuli were predictors of behavioral intentions. This relationship was strongly mediated by satisfaction and perceived value.

*1.4.4.5.Events*

Servicescape was also researched in the context of events. Siu et al. (2012) discussed that servicescape elements positively influenced customers' perceived quality of the service, customer satisfaction, and desire to stay. Data was collected in China from 362 participants. They concluded in their results that customers take a detailed perspective on servicescape, so much so that the servicescape construct should be customized based on the service context. While Wong et al. (2016) challenge the traditional view of program quality by highlighting that the service environment is a key antecedent to the quality–value–satisfaction framework. Data was collected in China from 341 festival attendees. Carneiro et al. (2019) researched the influence of eventscape on emotions, satisfaction, and loyalty. Data was collected from 517 festival attendees in Portugal. The findings indicate that in re-enactment events, the eventscape may contribute to improving the satisfaction and loyalty of attendees. The research reveals that design and entertainment are the eventscape dimensions with the most positive effect on emotions, satisfaction, and loyalty.

*1.4.4.6.Retail*

In the context of shopping areas Sharma et al. (2015) concluded in their study that the store environment did not elicit different positive influence on customer perceived value for international shoppers compared to domestic. Data was collected from 892 Chinese customers both domestic and international, in 6 shopping areas. The authors reasoned that the store

environment could have been taken for granted by both type of consumers as the location was already a mature consumer market. Han et al. (2019) revealed a significant role of self-image congruity in the retention generation process. This research uncovered a significant role of ambient atmospherics as a moderator in strengthening the relationships between emotional experiences and shopper retention as well as between shopper satisfaction and retention. Daa was collected in South Korea from 408 customers. The authors particularly emphasized on the importance of the quality of ambient atmospherics in the retail environment.

*1.4.4.7.Theme Parks*

One study explored the physical environment in theme parks. Wu et al. (2014) which concluded that the physical environment quality was the primary dimension of experiential quality perceived by the visitors. Data was collected in a theme park located in Taiwan from 424 visitors. Moreover, physical environment quality is confirmed to be the most important dimension of experiential quality perceived by theme park visitors.

*1.4.4.8.Spas*

Two studies investigated spas. Loureiro et al. (2013) revealed that atmospheric cues and involvement are important antecedents of relaxation and pleasure. Data was collected in Portugal in thermal spa hotels, targeting the spa. Collecting a total of 220 responses. Relaxation and pleasure influenced satisfaction with the spa and word-of-mouth intention. Moreover, the more customer considered the spa experience as playing a central role in their lifestyle the greater the pleasure and relaxation they felt. Virabhakul and Huang (2018) considered the physical environment as part of the service experience, indicating a significant relationship with emotions, perceived value, satisfaction, and behavioral intentions. Data was collected from 500 spa goes in

Thailand. Four factors were identified as part of the service experience physical environments, therapists and staff, spa products and treatments, and other customers. The service experience had significant effects on customers' emotions, perceived value, and satisfaction. However, no relationship was found between the service experience and behavioral intentions.

*1.4.4.9.Golf*

Wu et al. (2016) and Kim et al. (2019) focused on golf courses and golf events respectively. The first study found the physical environment quality as the third most important dimension of experiential quality perceived by golf tourists. A total of 542 valid questionnaires were collected in China. The results also pointed out that the perceived physical environment quality had an impact on the overall evaluation of the quality of the gold industry. Ambiance and design were the most important subdimensions of the physical environment quality, moreover, ambiance and design have been found to play a critical role in the overall evaluation of perceived quality.

The second study supported the full mediating effects of excitement between sport service environments (i.e., other consumers' passion and aesthetic scenery) and consumer citizenship behavior. A total of 281 participants from three Korean Ladies Professional Golf Associations tournaments took part in the study. The findings endorse that consumers are susceptible to both social and physical elements in a hedonic consumption environment. The study also found that the more excited the consumers were by the service environment (i.e., other consumers' passion and aesthetic scenery) the more they were willing to engage in social interaction with other consumers.

*1.4.4.10.        Hospitals*

Suess and Mody (2017, 2018) investigated hospitals, pointing out that patients preferred high-end material finishes and hospitality-certified healthcare while in the second study the infusion of hotel-like features that foster a sense of control, provide positive distractions and access to social support. Suess and Mody (2017) conducted a scenario-based experiment and collected a total of 406 responses from various countries, while Suess and Mody (2018) collected a total of 406 responses from the US looking at overall hospital room features.

**1.5.Discussion and future research directions**

*1.5.1.   Discussion of descriptive findings*

As presented in Table 1, the primary outlets for the physical environment in hospitality-related studies where IJHM and IJCHM. These two journals are highest ranked based on impact factor 9.237 and 6.514 respectively, and it seems logical that researchers would target them for publications. The top five hospitality journals each published a limited amount of physical environment studies considered the total amount of published studies. This dearth of research suggests that this is a relatively new field, and the research stream is still evolving. Particularly we can conclude this by the comparatively large number of studies published in IJHM (46% of total identified studies), compared to the other journals.

In terms of distribution by period, the research activity seems to have increased over the last years for the areas of Lodging and Restaurant. There was a sharp increase in 2019 and 2020. This can be considered as an indication of the importance of gaining and increasing attention from hospitality scholars. These results are in line with the industry trends of investing more capital and R&D in lodging and restaurant physical environment (Hospitalitynet, 2019; QSR,

2021). The restaurant area represents most of the research, research in areas of Airports, Cafes, Casinos, and Bars are largely lacking, suggesting more research opportunities.

When it comes to geographical location, two-thirds of the studies have been conducted in North America and Asia, suggesting studies should be conducted in other continents as well, to test the validity of conceptual models, but also the external validity of implications (Das, 2009). Most studies were conducted in developed countries, and the likely reason for this is because developed countries are where tourism and hospitality flourish as they have the capital for development. Only a few studies were conducted cross-country, and therefore more studies could be conducted in this matter to gain a greater understanding of how the physical environment may act comparably. Surprisingly only two studies were conducted in South America, two in Oceania, and only one in the Middle East, leaving room for future research in this area as well, especially considering the cultural background, and guest types.

In the methods section, most studies used survey methods for data collection. Heavily relying only on a single method of data collection may limit more conceptual areas that are underdeveloped in hospitality research. Surprisingly only 19 studies used an experimental design. The nature of the physical environment can be truly understood through experiments. Bell (2009) explains that through properly set up experimental design, researchers gain the increased ability to determine causal relationships and state causal conclusions. Although one may say that the physical environment research within the hospitality context may still be in the early stages, the literature will be enriched greatly if a wider range of research methods would be applied. Moreover, only 11.6% of studies adopted a qualitative approach. These results indicate the need for more conceptual support to facilitate knowledge. Several researchers argue the importance of qualitative studies, especially in younger fields (Xiao & Smith, 2006).

Statistical methods used in the identified articles were also presented in table 6. Over half of the articles used structural equation modeling for their analysis. The growing complexity of issues in hospitality research, especially as related to the physical environment can be characterized using complex techniques over time. Future research could benefit from expanding into other fields and integrating their methods in hospitality research.

An important shortcoming of the literature was identified when examining the theories that were used. A third of the articles (34.8%) did not adopt a theoretical perspective. The main theoretical lens adopted for 19.4% of the studies was the Stimulus, Organism, Response (S-O-R) (Mehrabian & Russell, 1974). The S-O-R model has been a predominant pick in the found studies as it has extensively been used in previous consumer behavior studies. Moreover, it offers a parsimonious and structured manner to integrate the critical roles of environmental cues in influencing consumer behavior (Liu & Zheng, 2019). However, several authors have criticized the use of S-O-R in general, as stimuli are not the beginnings of the cognitive processing, but the cognitive preparation is. Moreover, human beings' cognitive processing is a goal-oriented way instead of the passive way for the machines. Lastly, the reactions are not immediately initiated by a conscious intention, but rather, the responses are automatic and unconscious. Although a total of 59 different theories were used throughout the literature, indicating the multidisciplinary aspect of hospitality research, only a few theories that explain the multi-dimensional attributes of the physical environment, the perceiver, and the context in explaining aesthetic response were utilized (i.e., Hwang et al., 2012; Park & Jang, 2014; Chen et al., 2020). It is important to draw from theoretical frameworks developed in other disciplines, to provide useful insight into physical environment impacts and aspects in a hospitality context. Some theories are potentially relevant to understanding at a processing level the interaction between the physical environment

and the perceiver such as Processing Fluency Theory (Reber et al., 2004), Dual-processing model (Graf & Landwehr, 2005), or Categorization Theory (Loken et al., 2008).

*1.5.2. Discussion of research focus*

Within the research stream in the lodging area, four major themes have been identified and two subthemes: Satisfaction, Quality, Servicescape with subthemes of ambiance and design, and Biophilic Design. Based on the lodging types that were studied, and over a third of the studies did not identify what types of hotels they used for the data collection, while the other third pointed out that the context was of luxury hotels, followed by five start hotels, resorts, and four-star hotels. Very few studies focused on the budget and economy tier. In the United States, budget hotels especially represent a large proportion of the overall hotel industry and there is a need to understand how the physical environment impacts customers and employees.

Customer satisfaction was a highly frequent outcome in the lodging studies. While some studies used satisfaction with the physical environment as the outcome of their research (Gu & Ryan, 2008) other studies used satisfaction with the physical environment as a stepping stone towards behavioral intentions such as price acceptance (Ali et al., 2016). Moreover, the physical environment was often measured as part of the service experience (Brunner-Sperdin et al., 2012; Sanchez-Fernandez et al., 2020). All the studies that investigated satisfaction as an outcome of the physical environment investigated customers, however, no studies considered the impact on employees. Therefore, research in how the physical environment in a hospitality setting impacts employees would be welcome. Moreover, only one study, Sanchez-Fernandez et al. (2020), was found to analyze more in-depth how and what the customer (perceiver) processed in the physical environment. The lack of studies of this nature is perhaps due to the use of the S-O-R model predominantly, instead of other theories that consider the cognitive preparation as well as the

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processing mode. Future studies should expand to using aesthetics and design theories to better incorporate the whole process of reaching satisfaction.

Quality was a second emerging theme in the lodging area. The physical environment was studied in the context of the quality of the physical environment as well as part of the overarching hotel quality. Many studies (i.e., Juwaheer & Ross, 2003; Akbaba, 2006; Kirilloca & Chan, 2018) measures the physical environment by using SERVQUAL, which is a scale that measures service quality; however, it also has a component of the physical environment within it. An overwhelming number of studies used the physical environment as a component of the service quality of the hotel. Only a limited number of studies such as Surucu et al. (2019) and Liu et al. (2020) investigated the actual perceptions of the physical environment quality. Future research should explore scale development for measuring the physical environment quality in specific types of hotels. Moreover, none of the studies investigated potential moderators for the perception of quality, such as different generations, or types of travelers.

Servicescape was another recurring theme. The servicescape is a model developed by Booms and Bitner (1982) that emphasizes the impact of the physical environment in which a service process takes place. The servicescapes model aims to explain the behavior of people within the service environment to design environments that do not accomplish organizational goals in terms of achieving desired behavioral responses. The ambiance layout and design are also incorporated. The servicescape was present in a large proportion of the studies. The servicescape of hotels was closely examined regarding hedonic value perceptions (Chang, 2016) and other emotions (Lim, 2014), as well as guest perceptions. Similar to the satisfaction studies, all studies in this area focused on luxury or 5-star properties, leaving a gap in the literature when it comes to economy and budget hotels. Moreover, there is room for investigating more niche

types of travelers such as Song et. (2020) did with health care travelers. A deeper understanding

of business travelers, as opposed to leisure travelers, is lacking when it comes to atmospherics. In

terms of design, quite a few articles investigated different elements of Bitner's (1992)

servicescape model, however, most studies analyzed only hotel rooms, leaving room for future

research in other communal areas of the hotel. One study investigated the hotel lobby (Lee,

2019), while only one study looked at employees' perspectives (Chang, 2016). Future research

should take into consideration employee and management perspectives as well, as they do shape

the overall service experience (Nguyen et al., 2021).

Green spaces and biophilic design are relatively new trends in hospitality research

(Browning, 2020). Based on the identified studies, it is a growing area. A few studies

investigated nature-based spaces and biophilic settings. The handful of studies that investigated

this theme took place in the hotel lobby and the surrounding hotel areas. Moreover, this area was

one of the only ones which included budget hotels, and B&B. The growing number of articles in

the area in the last 3 years, indicates that future research should explore it. Moreover, several

facets of biophilic design are present, moving beyond the health benefits, but also considering

the overall impact on the experience.

Restaurants were the first most studied area in the identified articles. A total of 20 studies

did not specify the type of restaurants they investigated, however, 14 studies investigated Asian

restaurants, 8 full-service restaurants, 7 ethnic restaurants, 4 casual dining, and a few other ones

with very little frequency. Table 9 indicates that there is room for studies to focus on other types

of restaurants than Asian, ethnic, or themed restaurants. Like the lodging studies, satisfaction

was a major outcome of restaurant studies. Many different aspects of Bitner's service model

were investigated concerning satisfaction. However, there was a general lack of investigating

guest types, the purpose of the restaurant visits, and their previous experience. Moreover, no studies investigated the employees' perspectives, leaving room for potentially more research in this area. Quality was also a recurring theme in the restaurant research. Most studies analyzed the quality of the physical environment and how it impacts guest perception, hover some studies also included the physical environment as the overarching service quality umbrella. A very limited number of studies cross-analyzed different types of restaurants future research could greatly benefit more comparison studies. Many studies focused on restaurants that offered a particular type of cuisine such as Asian, however, little to no studies investigate American dinners for example, or local cuisine. Moreover, there are several new types of restaurants such as gastropubs which have not been present in the literature.

Servicescape was also a recurring theme in the restaurant research, represented by a large proportion of the studies. These studies took place on several continents and investigated the impact of servicescape on a deeper level. Satisfaction yet again played a central role as an outcome of the servicescape (Namasivayam & Mattila, 2007; Lin and Matilla, 2010). Several other studies also looked at the authenticity of servicescape in ethnic restaurants (Wanf & Matilla, 2013; Chao et al., 2021, Meng & Choi, 2017). Most of the studies investigated full-service restaurants, with no studies looking into quick service or fast food. Future studies should focus on this industry as well, and how can the servicescape enhance the service experience. Moreover, no studies investigated chain restaurants, with 100,383 Chain Restaurants businesses ("Chain Restaurants in the US", 2021) in the US, this area represents a large potential for research. Moreover, investigating chain restaurants would have significant managerial implications as well. Just one study investigated the impact of plants in restaurants (Apaolza et al., 2020) potentially opening another gap for research. Roughly half of the studies were guided

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by theory, from which S-O-R and Mehrabian and Russel Model played an important role. Future studies should dive into disciplines for theories, to broaden the understanding and research.

Atmospherics was also investigated in the restaurant research. However, there seemed to be a general confusion between atmospherics and servicescape, where the two terms were often used interchangeably. The two terms are different from each other and should not be used interchangeably (van Heerden et al., 2009). Similar to servicescape research, all articles in this section focused on full-service or luxury restaurants, leaving an opportunity for research in fast-food and chain restaurants. Moreover, only one study (Tantanatewin & Inkarojrit, 2018), focused on a specific location of the restaurant, the entry. Future studies should focus on specific areas of the restaurant as well, such as the bar location and the outside sitting. In the case of fast-food restaurants, the ordering counter, and the style of the kitchen design (open or closed).

Crowdedness was another area pertaining to the servicescape (Ali et al., 2021). Several articles investigated the effects of crowdedness on quality perception, and food perception (Tse et al., 2002). More so, some articles (Wang et al., 2021) also investigated the effect of crowdedness during the COVID-19 pandemic. A few articles also compared different cultures, i.e., the US and China in terms of congestion perceptions. Future studies should dive deeper into the perceptions of crowdedness and investigate different moderating variables such as age, family status, and income.

The third popular area in the studies was Casinos. Although not many studies focused on the Casino setting, the ones that did examine scents, the power of the physical environment to bring customers back, and how it impacted impulse gambling. Overall, there is room to explore the settings of the Casino and the impact of the physical environment, perhaps combining certain elements that were explored in other settings, such as biophilic design, crowdedness. The

locations of these studies were mainly Macao, China, or Las Vegas, US. Other casino-prone

areas should be investigated as well, including cruise ships casinos.

Surprisingly, only one study was identified to have focused on airports (Han et al., 2020).

This is an area that is reach and needs exploring. Customers go through airports for traveling and

business all the time. Interestingly, this study tapped into the benefits of green physical

surroundings, a recurring theme in the other areas as well. The research in cafes, although

limited, has tapped into ambiance (Lim et al., 2020), more specific aspects of the physical

environment such as lighting, layout, and music (Jeon et al., 2016). A gap identified in this area

is related to types of cafes being explored more in-depth, as well as researching them in the

context of different café going cultures. Moreover, different behavioral outcomes should

potentially be investigated, such as eWOM, tipping intentions, etc. Similarly, bars and nightclubs

did not have a great presence in the identified studies, however, the studies that focused on bars

and nightclubs investigated different servicescape elements (Kubacki et al., 2017). Moreover,

one study also took into LGBT-friendliness (Olson & Park, 2019), being the only study from all

the identified studies to take sexual orientation into account. More studies should be inclusive of

LGBTQ communities as well as gender non-conformist ones.

Cruises were also relatively under-researched, with only four studies. The existing studies

confirm the importance of physical environment on guest satisfaction, and behavioral intentions.

Future studies should analyze more in-depth the impact of atmospherics on consumers,

especially for different types of cruises that target specific customers such as families, singles,

retired customers.

The context of events was also under-researched with only 3 studies. Two studies

investigated the impact of the physical environment on satisfaction and quality with only one

study Carneriro et al. (2019) including emotions and loyalty. Events play an important role in the hospitality industry, and future studies should investigate more the "eventscape" in correlation to different emotions as well as behavioral intentions. Moreover, studies should also investigate the impact of the physical environment on upselling, and willingness to pay more. Furthermore, image congruity should be investigated as well, as customers participate in events as the eventscape is representative of the customers' interests.

Retail, theme parks, spas, golf, and hospitals, were under-researched. This is understanding as most of them are pertaining to the service umbrella, having specific journals. However, it is surprising spas were not more represented in the literature, as atmosphere and the physical environment is a major contributor to the experience.

## 1.6. Conclusion

The purpose of this study was to systematically review the literature currently available on the physical environment in the hospitality industry, explore the trends and developments that have emerged in recent years, explore the theories that were applied, and ultimately identify future avenues of research. Tranfield et al. (2003) explained that the results gathered from multiple studies and presented bound together, had to ability to present a more comprehensive and valid result than a single source. This study was guided by a series of overarching research questions and the findings are summarized henceforth.

RQ1 asked what the state of the physical environment research in the hospitality industry is as presented by the top industry journals. The overall lack of theory-driven research is worrisome, as to how else researchers can allow the abstraction of knowledge from the specifics of context (Cash, 2018). Moreover, based on the descriptive findings, there is an upward trend in

investigating the physical environment in the hospitality industry, however, it seems that this trend is mainly revolving around the hotel and restaurant industry.

Coming to RQ2, several gaps were identified in the above discussion. In terms of saturation, it seems clear that satisfaction as an outcome was overly used. Moreover, S-O-R was overwhelmingly used as the main theoretical basis along with Mehrabian and Russel. Future studies should adopt other interdisciplinary theories or mechanisms to guide their studies. Moreover, the theme of crowdedness was explored within the restaurant context, but not within the hotel or other contexts. Future studies should focus on this aspect as well. Similarly, the biophilic design was explored within the hotel context but was scarce in other contexts.

Lastly, RQ3 investigated the recurring themes of the physical environment research in a hospitality context. These recurring themes were presented both under descriptive findings, as the major contexts of research, hotels, restaurants, and casinos. And further broken down within each context, for hotels: satisfaction, quality, and servicescape, while for restaurants: satisfaction, quality, servicescape, atmospherics, and crowdedness.

Through analyzing 155 articles from the top 5 hospitality journals in the period 2000 – 2020, the study was able to identify the evolution of research and the direction of future research. The presented research indicates that the subject of the physical environment in the hospitality industry is still relatively young and rapidly growing.

## 1.7. Limitations

The present review has some limitations. Firstly, to maintain clear boundaries and to ensure high external validity, some works were not included such as book chapters, books,

conference proceedings, and gray literature. Moreover, only research articles in English were

considered. Furthermore, only five journals were included.

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## Chapter 2. Article 2. The Effect of Hotel Room Innovativeness and Typicality on Booking Intentions

### 2.1. Introduction

The Upper Midscale Hotel sector in the United States offered the highest number of rooms (21.4%) in 2020 after independent and unaffiliated hotels (Statista, 2021). Borrowing a page from the upscale playbook, midscale hotels have shifted their attention to the physical environment (Airoldi, 2019; Driedger, 2020; Fox, 2021). Guests no longer accept poor design just because they have paid $100 per night, they still want high design sensibility (Airoldi, 2019). The midscale market, which has been developed to make cheaper hotels attractive to own and stay in has evolved from the images of conformity and boringness to innovativeness and contemporary design (Ting, 2017), tending to the changing consumer attitudes and lifestyles. Moreover, the growing number of domestic travelers and the maturity of the hotel industry (Ren et al. 2016) helped the upper-midscale sector to continuously increase year after year (Elyssa, 2019). Based on STR data, there has been a shift in demand from high-end to low-end hotels from 2019 to 2020. In May 2019, luxury and upper-upscale accounted for 16% of all rooms sold that month while economy and independents made up 39.4% of all rooms sold. In May 2020, luxury and upper-upscale hotels made up 7.1% of all rooms sold while the economy and midscale properties accounted for 49.6%, STR data shows (Hess, 2020).

However, the current COVID-19 pandemic situation is unique for every sector across the globe, and the hotel industry had been among the hardest hit (Sönmez et al., 2020). Moreover, the situation for the midscale and economy class is faring better than others (Craig et al., 2021; Krishnan et al., 2020). Midscale hotels are better able to tap segments of demand that remained relatively healthy during the travel restrictions, such as truck drivers and extended stay guests;

moreover, they are also able to remain open at lower occupancy rates and as well as to reduce their variable and semi-fixed costs, especially labor (Krishnan et al., 2020). Therefore, midscale hotels are expected to bounce back faster to pre-pandemic levels than luxury and upper-scale hotels.

Previous studies have primarily focused on hotel sectors, where upper midscale was part of a subcategory but not the primary focus. Some of these studies investigated price response (Zhao et al., 2020), technology adoption (Hua et al., 2015), social media marketing (Leung et al., 2017), and overbooking taxonomy (Riasi et al., 2019). Regarding specifically focusing on upper-midscale hotels, Matilla and O'Neill (2003) focused on the relationship between pricing, occupancy, and satisfaction, Morosan et al. (2017) investigated e-commerce expenses and financial performance, as well as switching intentions (Han et al., 2011). Just a handful of studies specifically looked at the servicescape, such as Lee (2019) investigating the effects of biophilic design while Baek et al. (2020) compared lifestyle and traditional hotels service experience. Moreover, even though there is a plethora of research on hotel room design (e.g., Siamionava et al., 2018, Zhang et al., 2011; Bogicevic et al., 2018; Ransley 2001; Wittmann-Wurzer, 2019), the hotel sector, upper-middle-class hotel, is not discussed.

Based on previous research the physical environment, in general, has been considered by many studies to not only positively influence customer satisfaction (Ryu et al., 2012) but also retention (Sim et al., 2006). Although physical environment and room design, in general, have been considered in several research studies, they have not been the focus, but rather as part of success factors or antecedents of satisfaction, loyalty, and retention (Hua et al., 2009). Moreover, while investigating behavioral intentions and hotel rooms, researchers have only used the guest rooms, whereas the current research also incorporates the bathroom. Previous studies on hotel

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bathrooms have focused on sustainable environmental practices (Bobbett, 2010), brand packaging (Jeong & Kubickova, 2020), or bathroom as a hotel attribute in general (Dolnicar & Otter, 2003).

Overall, very little empirical attention has been given to room interior design and how does it impact the customer behavior intentions for upper midscale hotels. Due to the nature of the hospitality industry, customers have many more restrictions in terms of evaluating the services compared to products (Ali et al., 2015). Service providers have started exploring deeper the factors that can enhance their experience (Wong & Dioko, 2013). In terms of hedonic consumption, physical surroundings are a strong antecedent of customer satisfaction (Ryu & Han, 2010). Interior design is part of the physical environment, and there is overwhelming evidence on how important the physical environment is to perception, emotions, and behavioral intentions in the hospitality industry (Nanu et al., 2020). Design, in general, has become a pillar in today's competitive market, in terms of creating a differentiable product (Seifert & Chattaraman, 2020). Moreover, to distinguish themselves in a very competitive market, hotels have more than often relied on the aspects of the physical environment to capitalize on competitive advantage (Zemke et al., 2017). Although the importance of the physical environment and interior design has been proven to play a major role in behavioral intentions and various guest emotions, academic research on hotel room design is scarce, even more so in the context of upper midscale hotels. Drawing from the Pleasure-Interest Model of Aesthetic Liking (PIA) (Graf & Landwehr, 2017) and Most Advanced Yet Acceptable (MAYA) principle (Hekkert et al., 2003), the purpose of this study is to provide a holistic understanding of how the fluency of mental processing associated with the typicality and innovativeness of the design impacts pleasure and interest, which in turn leads to booking intentions. Moreover, this study

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will also investigate the moderating effect of the trip goal (hedonic or utilitarian) as well as the travel expertise on the relationship between design type and booking intentions.

This study will have both theoretical and practical implications. From a theoretical standpoint, the current research applies the Pleasure-Interest Model of Aesthetic Liking (PIA Model), a dual-processing theory in a hospitality context, advancing the understanding in the midscale hotel context. To the knowledge of the authors, the current article is the first to integrate the PIA in a hospitality context. Moreover, there is a gap in the literature in terms of the physical environment, particularly in the midscale hotel room area and bathroom, and this research aims to contribute to this gap. In terms of practical contributions, practitioners can use the findings of their study to guide them in how an ideal midscale hotel room and bathroom should look, leading to better customer attraction and an increase in bookings.

## 2.2. Literature Review

### 2.2.1. *Physical Environment*

The physical environment can be defined as the outward appearance of the service provider, and it plays an important role in influencing customers' expectations (Ali & Amin, 2014). Moreover, the physical environment impacts perceptions, behaviors, and emotions (Ryu et al., 2012). An increase attention was brought to the influence of the on-consumer behavior when Kotler (1973) introduced the term "atmospherics". While Bitner (1992) coined an umbrella term, "servicescape", referring to the physical feature of the environment where consumers and employees function (Pizam & Tasci, 2019). Therefore Bitner (1992) furthered the concept by demonstrating that servicescapes play an important role in the affective, cognitive, and

behavioral response of not only consumers but also employees. Kotler (1973) extended the concept of atmospherics to servicescapes.

There is an upward trend in empirical research focusing on the physical environment, having proven numerous times an essential factor in satisfying and attracting customers in the hospitality industry (Ryu & Han, 2011). Moreover, studies have proven the significant relationship between the physical environment manipulation and consumers' shopping behavior (Turley & Milliman, 2000). Bitner (1992) points out that the physical environment plays an important role when it comes to hedonic consumptions, which includes hospitality products. Furthermore, according to Kim and Moon (2009) the physical environment is a strong influencer of feelings and emotions, activating approach or avoidance.

### 2.2.2. Theoretical Background

#### 2.2.2.1. The Pleasure – Interest Model of Aesthetic Liking (PIA Model)

Research on cognitive psychology suggests that people experience the working of their ongoing cognitive operations such as perceiving, processing, and generation of information (Barsalou, 2010). The PIA Model offers a refined view on the aesthetic liking judgment between fluent and disfluent stimuli.  Graf and Landwehr (2015) build on previous fluency processing studies such as Reber et al. (2004), Muth and Carbon (2013) by providing a coherent theoretical explanation to why and when fluent versus disfluent stimuli lead to aesthetic liking. The PIA Model differentiates between pleasure-based and interest-based aesthetic liking and further explains the processing dynamics of these two routes. Moreover, the model also postulates that the processing of an aesthetic object can only be automatic, or first automatic, and then controlled. Automatic processing is the default aesthetic response as the controlled processing requires motivation. Furthermore, controlled processing can lead to the interest-based positive

aesthetic response as it is perceiver-driven. Graf and Landwehr (2015) ground their work in the

social psychology duality of mental processing (Strack & Deutsch, 2004). According to the PIA

model aesthetic preferences can be formed by both processing approaches, which represents two

hierarchical processing levels (Graf & Landwehr, 2015). Moreover, the model explains stimulus

preferences that only refer to the aesthetic quality of that stimulus.

The core premise of the Pleasure-Interest Model (Graf & Landwehr, 2015) has been

further tested by Graf and Landwehr (2017) by adding attractiveness in the context. Their results

point out that the effect of stimulus fluency on attractiveness was fully mediated by the aesthetic

pleasure, more so during automatic processing. The relationship between pleasure and interest

has further been investigated by Consoli (2016), looking at the multidimensionality of aesthics

liking. Moreover, Consoli (2017) further points out that the definition and opalization of

aesthetics pleasure, aesthetics interest, and liking have not been done adequately in the pleasure

interest model. Particularly, Stienmetz et al. (2021) argues that the automatic preference

formation as well as the controlled one can produce different outcomes.

Several articles utilized the PIA model to explain the dual processing phenomena in

terms of art (Ball et al., 2018), design newness (Talke et al., 2017), and and aesthetics sensitivity

(Seifert & Chattaraman, 2017). The PIA Model has not yet been explored in the context of

hospitality research, to the best of the authors' knowledge. The current section will explore its

application in other research fields, to elaborate and present its application. In the context of

abstract art, Ball et al. (2018) explored the effects of stimulus complexity and conceptual fluency

of aesthetic judgements of abstract art. The participants in this study were presented with two

levels of complexity and five levels of fluency based on the PIA Model. The participants were

then asked to rate the beauty and creativity.  The predictive capacity of the PIA Model in relation

to beauty judgements was supported. In a similar study Vissers and Wagemans (2021) the authors tested the PIA model on a series of low, medium, and high-fluency photographs. The results indicated that similar low interest percentages were found for the highest fluency photographs, and highest interest ratings were found for medium levels of fluency. Kumar et al. (2018) investigated appscape in terms of app adoption and m-loyalty, explaining that non-fluent aesthetics liking can create interest in the users. Moreover, in the context kitsch and art, basing the viewer's aesthetics appreciation on the dual processing dynamics. Steciuch et al. (2021) further tested the PIA model in the context of abstract artwork. Their results indicated that the controlled processing conditions led to greater pleasure and interest. Moreover, the gut-reaction condition and fluency affected pleasure but not interest. Lastly, Damiano et al. (2021) used the PIA model to analyze the role of local and global symmetry of natural scenes. Their results provided further support for the PIA model, finding distinct roles of global and local symmetry.

As people constantly experience the ongoing of their cognitive operations such as perceiving, processing, and generation of information, this working is reflected in a feeling of fluency or disfluency. The PIA model further postulates that automatic processing is stimulus driven, and the default way of processing, while controlled processing is perceiver-driven and therefore leads to an interest-based positive aesthetic response. The model further explains that the type of processing leads to the formation of pleasure and interest. Pleasure is triggered by fluency during the automatic processing, while interest in experienced during the controlled processing. Graf and Landwehr (2015) proposed two studies to investigate the pleasure portion of aesthetics liking as triggered by fluency that is experienced during the automatic processing. Moreover, interest is caused by the experience of disfluency reduction as it occurs during the controlled processing. In the current study, the upper midscale hotel room design will trigger

either automatic or controlled processing for the hotel guests, which will lead to either fluency or disfluency, and further leading to pleasure or interest, and lastly arriving at a positive behavioral intention.

*2.2.3. Hypotheses Development*

*2.2.3.1. The most advanced yet acceptable design (MAYA) and booking intentions*

According to Fishbein and Ajzen (1975), behavioral intentions are the main predictors of actual behaviors. In hospitality and tourism-related research, booking intentions have widely been utilized especially with the advancement of technology and the internet (Sparks & Browning, 2011). According to Spears and Singh (2004) purchasing intention is the conscious plan or intention to make an effort to purchase a product; booking intention is similar to purchasing intention, and it refers to the consumer booking a hotel room. Previous research has concluded that images of the physical environment of a hotel can significantly impact consumer's intentions to book (Baek & Ok, 2017). Moreover, there has been a considerable amount of research investigating how consumers react to visual cues and how it is used in making decisions (Bagozzi et al., 2000). Previous research has focused on two different effects of typicality on aesthetics liking (Blijlevens et al., 2012); one strand of the research proposed that people prefer typical over less typical objects (Whitfield & Slatter, 1979) while another strand postulated that people are more attracted to novel appearances (Berlyne, 1950). However, Lowey (1951) argued that when typicality and novelty are well balanced, they can have a positive effect on the aesthetic appraisal. The MAYA principle postulates that there is a logic that explains why there is a general preference for a balanced mix between typicality and novelty (innovativeness in the current research) (Hekkert et al., 2003). Specifically, when it comes to new products there is general support for this harmonious mix, as the MAYA principle seeks to integrate the

preference for prototypes with the need for novelty (Hekkert et al., 2003). Although the aesthetic properties of typicality and novelty are opposite on a continuum, they are very much important in discovering product design preferences and ultimately product sales (Lidwell et al., 2010). Researchers pointed out that when people are forming first impressions a prototypical stimulus is preferred (Mayer & Landwehr, 2018), in the current case the customers are forming a first impression on the budget hotel room.

The novelty of a product has been previous described by many similar terms such as originality (Howard et al., 2008), novelty (Amabile, 1983), or innovativeness (Galati, 2015). In the current study, the novelty will be operated as innovativeness, which is defined by Carbon and Leder (2005) as "originality by virtue of introducing new ideas" (p.587), in other words introducing something new. The authors further add that innovative products represent either highly novel object properties or an uncommon combination of known properties. There is a plethora of research investigating the effects of the physical environment and interior design on consumer innovativeness (Oksanen & Stahle, 2013), however, there is a lack of empirical research in terms of interior design attributes that are perceived as creative or innovative (Cho & Yoo, 2018).

Typicality can be defined as the degree to which an object, or design in the current study, is representative of a category (Blijlevens et al., 2011). According to Hekkert et al. (2003) typicality is considered as a measure of goodness of example. McClelland et al. (1986) explain in their study that when a typical stimulus is presented to a perceiver the cognitive apparatus recognizes and categorizes the stimulus with ease, the moreover typical design is processing more fluently than the atypical one, resulting in a positive appraisal. According to Whitfield and Slatter (1979), the more prototypical an object is the more it will be aesthetically preferred. This

linear relationship has been explored in a wide array of fields including house design (Purcell, 1984) and interior design (Pedersen, 1986). Environmental cues are used by consumers to categorize services such as hotels as these kinds of products cannot be evaluated before purchase, and therefore tangible cues are sought out for (Shostack, 1977). In a sense, consumers rely on the physical environment cues to categorize and process much as they would do for product packaging (Bitner, 1986). Ward and Dahl (2014) pointed out in their study that mass-market services being perceived as typical was beneficial. In their context typical design was defined as exemplary within its category. The above-mentioned study also corroborates Ward's (1990) study which pointed out that products from within a category are more to share a range of attributes that cause them to be typical.

Overall, the literature on hotel room design is scarce. Bogicevic et al. (2018) investigated the gender and age preferences of hotel room design, concluding that age and gender moderation the relationship between guest satisfaction and room design style (masculine and feminine colors as well as contemporary and traditional). The aforementioned study applied the hunter-gatherer theory to explain the color choices between the two genders. In a similar study Siamionova et al. (2018) investigated how spatial colors impacted guests' perceptions of a hotel room. Finding a strong relation between wall hue and arousal level, as well as blue tones being viewed more pleasant than red ones. The color-in-context theory (Elliott & Maier, 2012) was used as well as Oliver's et al. (1997) circumplex models. Several other studies using hotel room design as an attribute to the overall experience, or base of paying a higher rate, without further discussing any theoretical concepts (e.g., Matilla & O'Neill, 2003; Ransley & Ingram, 2001; Signaw & Enz, 1999; Wittmann-Wurzer & Zech, 2019; Zhang et al., 2011).

Building on the MAYA principle and the above discussion, for a design to be successful the harmonic balance between innovativeness and typicality, must be established, trying to be as innovative as possible while preserving as much as possible the typicality of the design. Therefore, the following hypothesis is proposed:

*H1*: Booking intentions are more favorable for upper midscale hotel interior designs with high innovativeness and high typicality (the most advanced yet acceptable design) as compared to other combinations.

*2.2.3.2. Moderating Role of Trip Goal (Utilitarian vs. Hedonic)*

Research shows that consumer attitudes are formed of two dimensions: utilitarian and hedonic (Voss et al., 2003). Online as well as offline shopping is done for both utilitarian and hedonic reasons (Wolfinbarger & Gilly, 2001). Moreover, previous studies have classified trip goals as utilitarian of hedonic (Mirzaei & Mignot, 2021). When traveling in one's spare time, the consumption practice can be defined as hedonically (Hirschman & Holbrook, 1982). The hedonic dimension in terms of travelling is more subjective and personal as well as reflecting the potential and desire for product uniqueness, symbolic meaning, and emotional arousal (Gursoy et al. 2006). In contrast, utilitarian behavior is characterized as functional or task oriented (Dhar & Wertenbroch, 2000). The value for utilitarian behavior results "from some type of conscious pursuit on an intended consequence" (Babin et al., 1994, p.645). Ham et al. (2019) further add that utilitarian travel consumers base their purchase decision on rational judgments, perceiving their purchases as rational. Therefore, the utilitarian dimension is associate with travel services that can prove instrumental in fulfilling functional goals. Following the lead of Prebensen and Rosengren (2016), the current study delineates that travel consumption can occur for both

hedonic and utilitarian reasons. Babin et al. (1994) further add that hedonic values are subjective and include playfulness and fun, moreover Holbrook and Hirschman (1982) further add that consumers seek fantasy, arousal, and sensory stimulation. However, the tourism industry must be capable of providing both hedonic and utilitarian services and facilities as this is fundamental to travelling. When a consumer travels for hedonic purposes, they are looking for fun or to be social, whereas when travels for utilitarian purposes they are more concerned with value for money, efficiency during their experience (Prebensen & Rosengren, 2016). A upper midscale hotel can have both utilitarian and hedonic value. Consumers with a utilitarian goal count on their consumer need to be satisfied with success, their behavior being translated into simple acquisitions of products and services (Vinerean, 2013). In a study conducted by Ryu et al. (2010) the authors pointed out that utilitarian values are more likely to impact behavioral intentions in a hospitality context.

The current study will investigate how the hotel room design impacts consumers with utilitarian and hedonic goals. The MAYA principle aims to offer the highest innovativeness and typicality in design and based on the above discussion consumers with utilitarian goals are more likely to be interested in simple yet advanced upper midscale room design. The services that they seek need to accommodate functional goals (Vu & Nielsen, 2018). In contrast consumers with hedonic goals would be more interested in non-tangible benefits (Arnold & Reynolds, 2013), which can stimulate design uniqueness, emotional appeal, not related to the physical function (Dhar & Wertenbroch, 2000). Previous studies have pointed out repeatedly that hedonic travel goals include fun, enjoyment, and entertainment (Mainolfi et al., 2021). Hedonic travel goals may be interpreted as the experience of spending time (Shiau & Luo, 2013) in the upper midscale hotel room. Additionally, Scholl-Grissemann and Schnurr (2016) explain that hedonic

hotel rooms are perceived as being fancier as opposed to utilitarian ones. Utilitarian value refers to attributes such as reliability, durability, and price, and is rooted in the economic utility theory (Sheth et al., 2000). In comparison the hedonic value is related to emotions and sees the hotel customer as a feeler rather than a doer (Holbrook & Hirschman, 1982). In the context of the MAYA principle, the goals sought by hedonic travel consumption would translate into high innovativeness and low typicality, as opposed to high innovativeness and high typicality, which would resonate more with the utilitarian travel consumption. Considering the above discussion, the following hypothesis is proposed:

> *H2*: Compared to other design combinations, the most advanced yet acceptable upper midscale hotel interior design will result in more favorable booking intentions for utilitarian rather than hedonic goals in hotel reservations.

*2.2.3.3. Moderating Role of Travel Expertise (Experienced vs. Inexperienced Traveler)*

Previous research has emphasized on the importance of product and service knowledge and expertise, especially when processing a given set of information (Bruck, 1985; Moore & Lehmann, 1980). It impacts the perception of the message content, be it related to the product or service itself, the class, or usage (Pan et al., 2020). Scholl-Grissemann and Schnurr (2016) explain in their study that experienced consumers are more confident and have an easier time to express their preferences as opposed to inexperienced ones. Hoeffler and Ariely (1999) further add that experienced consumers already have a combination of products and services that they prefer, and over time it changes and stabilizes. Experienced travelers are more accustomed to a variety of standards and expectations when it comes to traveling (Tussyadiah & Pesonen, 2016). Consumer knowledge is mostly referred to as product expertise (Cordell, 1997) and has been

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found to be an antecedent of tourism related information seeking, and travel organization (Eletxigerra et al., 2021). Auh et al., (2007) further add that the more expertise the consumers gather, the better they can assess the attributed of various offerings. Moreover, the lack of expertise leads to reasons to why consumers are resistant to adopting new products (Montaño & Kasprzyk, 2015). Teichmann (2011) discuss in their findings that travel experience leads to product expertise. Previous travel experience increases the familiarity with hotels in general (McCleary et al., 2007). Pearce and Caltabiano (1983) argue that experience changes the consumers' evaluation of a product, playing an important role in future behavioral intentions (Samuel et al., 2015). Pearce and Lee (2005) posit that motivation changes according to the travel experience.

According to the PIA Model, an observer needs to have the desire to possess knowledge about an object to process an aesthetic stimulus. Graf and Landwehr (2005) discuss in their study that preexisting knowledge structures of a stimulus motivate the perceiver to gather more and process to adapt and revise the existing knowledge structure. Naturally experienced travelers have utilized upper midscale hotel rooms and therefore already have a knowledge base. On the other hand, inexperienced travelers would be satisfied with the processing of this new knowledge and would not be motivated to pursue it further. As inexperienced travelers do not have the possibility to bank into previous perceptions that were formed (Walls et al., 2011). Moreover, Walls et al. (2011) point out in their study that the processing of the hotel room is a rather complex phenomenon, and among other elements the physical environment is perceived uniquely by each guest, moreover, personal characteristics (experience in the current case) and trip related factors also influence the overall perception (Domenico & Lynch, 2007). Baker (1998) also explains that people categorize products and services based on congruency,

accordingly, the information that is available to them in terms of visual and past experiences will be used. Furthermore, in a study conducted by Ranscompe et al. (2015) the authors point out that people form their opinions on the "sweet spot" of a design, in the current case most advanced yet acceptable, in a category based on what they have been exposed to in their daily life; in other words, experienced travelers would have had more exposure than non-experienced ones. Hence, the following hypotheses are proposed:

> *H3*: Travel experience will moderate the relationship between the design type and booking intentions, such that the most advanced yet acceptable design will result in more favorable booking intentions for experienced travelers rather than non-experienced.

*2.2.3.4. Mediating Role of Pleasure and Interest*

According to Reber et al. (2004), aesthetic pleasure is a subjective experience that is directed to an object and not mediated by intervening reasoning. Moreover, Hekkert and Leder (2008) defines aesthetic pleasure as pleasure that comes forth simply from perceiving something using sensory and motor understanding. In the current study, the before-mentioned definition is adapted to hotel room interior design rather than an object. The PIA model further explains that the amount of pleasure and displeasure are a function of the processing-based affective feeling. When the processing is stimulus-driven and automatic, then the processing is followed by perceiver-driven controlled processing. Although the feeling is not assigned to the stimulus it channels the motivation to process the stimulus controlled. The PIA model argues that the perceivers only experience fluency of their automatic processing if it is different from their expected fluency. When the stimulus processing ends with automatic processing, then the affective feeling will translate into aesthetic pleasure or displeasure. The current research will

focus on aesthetic pleasure. If there is further motivation to process, then it will lead to disfluency. An interest to process further arises when people have the desire to learn more about a stimulus. Interest represents a pre-insight anticipation, evoked by the appraisal of high stimulation potential and the expectation of coping potential (Silvia, 2008). Previous research has shown that after working on cognitive tasks there is an increase in interest in the task (Efklides & Petkaki, 2005). Berlyne (1971) further adds that those stimuli that are within the aversive range, at the same time will permit relatively prompt arousal reduction. Graf and Landwehr (2005) further explain that as long as people experience fluency increase and disfluency reduction then they will be interested to seek that future positive affective feeling. Interest will consist of an appraisal of novelty followed by an appraisal of coping potential (Silvia, 2005). In the current case, consumers will appraise the high innovativeness and then use high typicality as the coping potential. Merhabian and Russel (1974) attributed a behavioral reaction as a sign of increased pleasure. Fiore et al. (2005) found that stimulating the experience through design can lead to consumer pleasure, as well as willingness to purchase. Graf and Landwehr (2017) also pointed out in their study that the aesthetic judgement depends on the perceiver's processing style and that pleasure was a stronger predictor of liking than interest. Winkielman et al. (2006) discussed in their study that typical design are easy on the eye, and therefore easier to process, while Yang et al. (2019) pointed out that matured markets, such as the upper midscale hotel market, may lack innovation which would negatively impact interest. Adam et al. (2016) stress that emotions such as pleasure play a pivotal role in shaping behavioral outcomes. Moreover, pleasure is triggered by an experience of fluency during automatic processing, while interest is driven by an experience of disfluency reduction during controlled processing (Graf & Landwehr, 2017). Based on the above discussion and the PIA model the following hypothesis is proposed:

*H4a*: Consumer pleasure will mediate the effects of typicality and innovativeness in upper midscale hotel interior designs on booking intentions.

*H4b:* Consumer interest will mediate the effects of typicality and innovativeness in upper midscale hotel interior designs on booking intentions.

### 2.2.3.5. Mediating Role of Fluency and Disfluency

Fluency has been found to impact the ratings of aesthetic liking especially for simple or standard products (Mayer & Landwehr, 2018), in the current case upper midscale hotel rooms. Fluency is the subjective experience of ease or difficulty with which we can process information (Oppenheimer, 2008). Fluency facilitates pattern recognition and higher familiarity or reducing the processing costs (Reber et al, 2004). Higher fluency leads to easier processing and therefore a positive effect (Winkielman & Cacioppo, 2001). The core characteristics of a stimulus can influence the experience of fluency when they are nonspecific to its content (Reber et al., 2004). Winkielman et al. (2006) explain in their study that prototypical stimuli trigger higher fluency as product categorization is activated more quickly. Fluency is hedonically marked and has the potential to drive positive effects for two reasons. First, fluent processing may exhibit the progress of recognition and interpretation of the stimulus. Second, it may be the cue that the stimulus is familiar and therefore has been encountered before (Schwarz, 2001). Winkielman et al. (2003) prove in their study that fluency yields more favorable judgements of the stimuli. A study conducted by Posner and Kreele (1968) pointed out that when people are presented with random-dot patters, prototypical patterns are identified much faster than distorted ones. Moreover, several researchers discussed that fluency is associated with stimulus recognition across broad dimensions (Park et al., 2020). Furthermore, Bierdman and Vessel (2006) found in

their study that more novel or innovative designs are more appreciate, as long as recognition or fluency also takes place. As fluency plays a vital role in processing typicality and innovativeness the following hypothesis is proposed:

> *H5:* Fluency will mediate the effects of typicality and innovativeness on pleasure in upper midscale hotel interior design.

Processing encompasses a full continuum from disfluency to fluency (Greifeneder& Unklebach, 2013). Disfluent processing is defined as slow and effortful progress towards stimulus recognition and judgment (Winkielman et al., 2006). Kuhl & Eitel (2016) argue in their study that disfluent processing forces a deeper and more analytical processing. Alter et al., (2007) further adds that disfluency can serve as a cue that pushes individuals to adopt a systematic approach to information processing. Alter (2013) found that disfluency makes people think more deeply, therefore sparking an interest that can lead to a positive behavioral outcome. Similarly, Pocheptsova et al. (2010) also point out in their study that disfluency can enhance the products uniqueness in certain consumption scenarios, that would lead to purchase intentions. Consumers are interested in both familiar products but at the same time they seek novelty or innovativeness, and therefore disfluency is desirable even though fluency is hedonically marked. The effects of typicality and innovativeness in the context of the MAYA principle would require more extensive processing and hence the following hypothesis is proposed:

> *H6:* Disfluency will mediate the effects of typicality and innovativeness on interest in upper midscale hotel interior designs
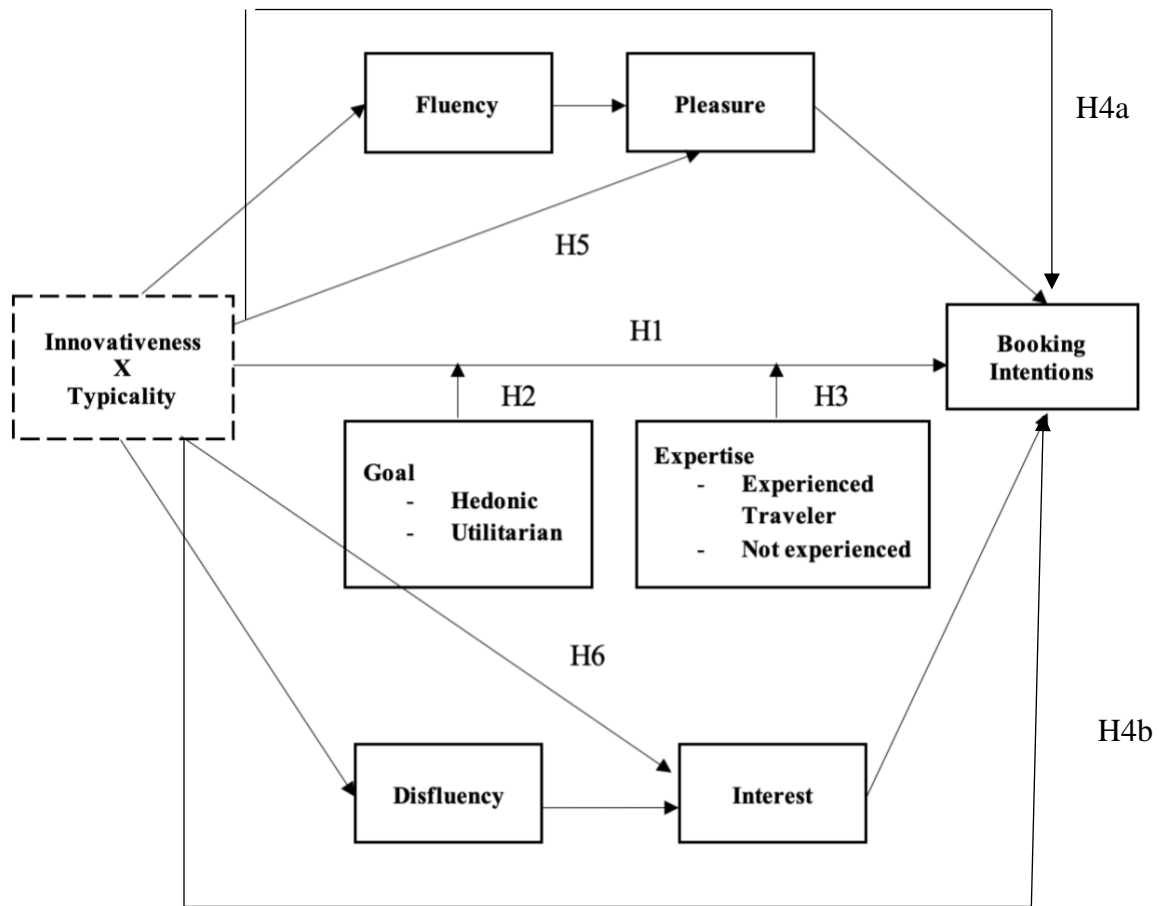
**Figure 2. Article 2 Model**

## 2.3. Methods

### 2.3.1. Research Design

This quantitative study will be designed as an online scenario-based experiment. The study will use a 2 (Innovativeness: Low vs. High) × 2 (Typicality: Low vs. High) between-subjects experimental design. Participants will be randomly assigned to one of the 4 experimental conditions.

### 2.3.2. Sampling Procedure

Both the stimuli check and survey for the main study were distributed via Amazon Mechanical Turk™ (MTurk) Master List as a self-administered online questionnaire. The sample

of the pretest was a non-probabilistic quota sample, consisting of 120 U.S. participants recruited from Amazon Mechanical Turk (MTurk). The questionnaire was posted on the Qualtrics platform and distributed online via Amazon Mechanical Turk (MTurk). Prior research has indicated that MTurk is an appropriate tool to reach a diverse demographic. Moreover, it offers an inexpensive data collection method that yields reliable results (Lu et al., 2021). In addition, Mturk has been widely adopted in the field of hospitality and tourism for data collection (e.g., Jeong & Lee, 2017; Kim & Baker, 2020; Shin & Matilla, 2020). To improve response quality the guidance of Lu et al. (2021) on how to improve response quality by using MTurk for data collection will be followed. Participants were shown one of the four scenarios. To ensure quality of data several steps were taken such as implementing pre-qualifying questions, asking the date of birth of the participants at the beginning and at the end of the survey, asking participants to fill two text boxes briefly describing what they look for in a hotel room and what is the name of the last hotel they have stayed at. Additionally, several attention check questions where placed in the survey as well.

### 2.3.3. Stimulus Development

Using STR's list of upper-midscale hotels and Statista's highest rated upper midscale brands in North America, 2021, an initial list of the top 14 hotels in the US were be established. Various rooms of these hotels were retrieved to establish what design attributes of an upper midscale hotel room and bathroom has. These results were used to model the actual stimuli. The room shape was manipulated for innovativeness/typicality while the bathroom fixtures were also manipulated. Before the main experiment, a pretest was conducted to identify if the stimuli are representative of low and high innovativeness and low and high typicality.

*2.3.4. Measurements*

All measurements will be used from previously published studies and adapted to fit the current

context.

**Table 9. Original Measurements**

| Variable | Measures | Source | α |
|---|---|---|---|
| Typicality | 7-point Semantic differential scale<br><br>This hotel room design is:<br><br>• Very typical – very atypical<br>• Extremely good example – extremely poor example<br>• Very representative – very unrepresentative | Loken and John (1993) | .98 |
| Innovativeness (Novelty Scale) | 5 Point Liker Scale<br>• NOV1: This room design is new<br>• NOV2: The room design is novel and refreshing<br>• NOV3: This room design unique<br>• NOV4[*]: This room design will provide an unusual experience<br>• NOV5[*]: I found going to this hotel room can be a novel exper | Jeong et al. (2017) | .88 |
| Booking Intentions | 7-point Likert Scale<br>• If I were going to reserve a hotel room, the probability of reserving this hotel room is...<br>• The probability that I would consider reserving this hotel room is...<br>• The likelihood that I would reserve this hotel room is... | Baek and Ok (2017) | .96 |
| Expertise | In 2018 Americans took on average 4.4 trips per year, with an average of 6.7 days long (Frickle, 2020). If the participant took less than 4.4 trips per year then they would be not experienced, anything over would make them experienced<br><br>5-point Likert Scale<br>• I do not travel a lot (1)<br>• I do not consider myself as experienced regarding traveling (2)<br>• For many years, I have been traveling a lot, I have seen many places and consider myself as experienced regarding travelling (3) | Frickle, (2020)<br><br><br><br><br>Teichmann (2011) | N/A<br><br><br><br><br>.72 (item 1)<br><br>.89 (item 2)<br><br>.79 (item 3). |

| Goal | HED/UT Scale developed by Voss et al. (2003) has been previously used by Gursoy et al. (2006) to measure attendees' attitudes toward festivals. | Voss et al. (2003) | |
|---|---|---|---|
| | 7-point Liker scale | | |
| | • Utilitarian | | |
| |     o Necessary/unnecessary | | .90 |
| |     o Effective/ineffective | | |
| |     o Functional/not functional | | |
| |     o Practical/impractical | | |
| |     o Helpful/unhelpful | | |
| | • Hedonic | | |
| |     o Dull/exciting | | |
| |     o Not delightful/delightful | | |
| |     o Not fun/fun | | |
| |     o Not thrilling/thrilling | | |
| |     o Boring/interesting | | |
| | | | .96 |
| Subjective fluency experience | Horizontal slider (a visual analog scale with an internal resolution of 100 steps) | Mayer and Landwehr (2018) | N/A |
| | • The process of thinking about this picture . . . | | |
| | • is difficult for me versus comes naturally to me | | |
| | • is exhausting for me versus is easy for me | | |
| | • I perceive to be sluggish versus I perceive be smooth | | |
| Pleasure | 1–7 bipolar Likert scales | Turner and Silvia (2006) | N/A |
| | • enjoyable - unenjoyable | | |
| | • cheerful - sad | | |
| | • pleasing - displeasing | | |
| Interest | 1–7 bipolar Likert scales | Turner and Silvia (2006) | N/A |
| | • interesting - uninteresting | | |
| | • boring - engaging | | |

## 2.4. Findings and Analysis

### 2.4.1. *Pre-Test Manipulation Checks*

To make sure each scenario is perceived as intended an interdependent sample t-test was performed. The participants were placed in 2 different scenarios, one with the atypical bathroom

design, and atypical room design, and the second one with the typical bathroom and room. The

manipulation check was conducted by measuring typicality and innovativeness of each of the

rooms and bathrooms. A total of 60 participants were placed in the typical bathroom/room

scenario while 58 were placed in the atypical bathroom/room, 9 respondents were removed as

they failed the prequalifying questions. Overall, the manipulation checks were successful, further

details are provided in the table below. Further details are offered in table 10.

**Table 10. Manipulation Checks Scenarios Pilot**

| Room Typicality | | M | SD | df | t | p |
|---|---|---|---|---|---|---|
| | Typical Room | 3.43 | .84 | 116 | 6.36 | <.001 |
| | Atypical Room | 2.52 | .72 | | | |
| Room Innovativeness | | | | | | |
| | Typical Room | 3.29 | 1.19 | 116 | -5.06 | <.001 |
| | Atypical Room | 4.18 | .61 | | | |
| Bathroom Typicality | | | | | | |
| | Typical Bathroom | 3.15 | 1.05 | 116 | 4.43 | <.001 |
| | Atypical Bathroom | 2.35 | .90 | | | |
| Bathroom Innovativeness | | | | | | |
| | Typical Bathroom | 3.61 | 1.1 | 116 | -2.2 | .029 |
| | Atypical Bathroom | 4.03 | .97 | | | |

### 2.4.2. *Manipulation check*

As recommended by previous studies (e.g., Purani and Kumar (2018), Tifferet and Vilni-

yavets (2017), and Lee et al. (2019)), the experimental manipulations were assessed. The

manipulation checks showed significant differences in the expected directions. An independent-

samples t-test revealed that the participants who were placed in the innovative room had had a

higher mean when checked again the innovative room scale ($M = 5.18$, $SD = .97$) compared to

the participants placed in the scenario with the typical room ($M = 2.65$, $SD = .59$), $t(197) = -$

$22.47$, $p < .001$. Furthermore, the typical rooms were also checked against the typicality scale.

The participants successfully identified that the typical room ($M = 4.84$, $SD = 1.26$) as rating

higher on typicality compare to the innovative room ($M = 2.71$, $SD = .86$), $t(197) = 13.88$, $p = .001$

A similar procedure was followed for the innovative and typical bathrooms. There was a significant difference between the innovative and typical bathroom while checking against the innovativeness scale; the innovative bathroom ($M = 5.07$, $SD = 1.25$) scoring much higher than the typical bathroom ($M = 2.74$, $SD = .68$), $t(197) = -16.62$, $p < .001$. Similarly, while checking against the typicality scale, the typical bathroom ($M = 4.67$, $SD = 1.49$) scored higher than the innovative bathroom ($M = 2.82$, $SD = .73$), $t(197) = -10.82$, $p < .001$.

### 2.4.3. Sample description

A sample of 500 participants was collected using Amazon Mechanical Turk Master List. However, only 199 responses were usable as the rest failed the pre-qualification questions and the various attention check questions. The survey started with a pre-qualifying question, followed by a text box answer. Participants were also asked their age at the beginning and end of the survey. Hence, the failure of any of these checks rendered those answers unusable. Similar numbers of males (57.3%) and females (42.7%) participated in the study. Many of the participants were between 35 and 44 years old (35.2%) followed by 25 to 34 years old (30.7%). The educational level of the participants varied, however, the most frequently reported educational level was bachelor's degree (52.3%), followed by some college (10.6%) and high school graduate (10.6%). Almost all participants (94%) were employed. Most participants (66.3%) traveled for pleasure, while only 19.1% traveled for business; 14.6% traveled for both. In terms of income, 14.6% received an income of $40.000 - $49.999, 13.6% received an income of $50.000 - $59.000 while 11.6% received an income of $30.000 - $39.999. More details information on the demographic characteristic of the participants can be found in table 11.

**Table 11. Characteristics of Participants**

| Variable | Values | % | Variable | Values | % |
|---|---|---|---|---|---|
| **Gender** | Male | 57.3 | **Occupation** | Management, professional, and related | 32.8 |
| | Female | 42.7 | | Service | 15.1 |
| | | | | Sales and office | 18.1 |
| **Age** | 18-24 years old | 3.5 | | Farming, fishing, and forestry | 2.5 |
| | 25-34 years old | 30.7 | | Construction, extraction, and maintenance | 6.5 |
| | 35-44 years old | 35.2 | | Production, transportation, and material moving | 4.5 |
| | 45-54 years old | 13.6 | | Government | 4 |
| | 55-64 years old | 13.1 | | Retired | 5 |
| | 65+ years old | 4 | | Unemployed | 6 |
| **Marital Status** | Married | 58.3 | **Education** | Less than high school degree | .5 |
| | Widowed | 1 | | High school graduate (high school diploma or equivalent including GED) | 10.6 |
| | Divorced | 7 | | Some college but no degree | 10.6 |
| | Separated | .5 | | Associate degree in college (2-year) | 12.1 |
| | Never married | 33.2 | | Bachelor's degree in college (4-year) | 52.3 |
| **Income** | Less than $10,000 | 5 | | Master's degree | 12.1 |
| | $10,000 to $19,999 | 10.6 | | Doctoral degree | 1 |
| | $20,000 to $29,999 | 10.6 | | Professional Degree (MD, JD) | 1 |
| | $30,000 to $39,999 | 11.6 | **Travel** | Pleasure | 66.3 |
| | $40,000 to $49,999 | 14.6 | | Business | 19.1 |
| | $50,000 to $59,999 | 13.6 | | Mixed | 14.6 |
| | $60,000 to $69,999 | 6 | **Travel companions** | With Family | 65.8 |
| | $70,000 to $79,999 | 6 | | Alone | 34.2 |
| | $80,000 to $89,999 | 5.5 | | | |
| | $90,000 to $99,999 | 5.5 | | | |
| | $100,000 to $149,999 | 7.5 | | | |
| | $150,000 or more | 3.5 | | | |

N = 199

## 2.4.4. Reliability

The reliability of the constructs was tested through SPSS's scale reliability analysis.

According to Hair et al. (2010) Alpha Cronbach's value above 0.7 is considered a reliable and

acceptable index. As shown in Table 12, the findings confirm that all the variables are valid and reliable.

**Table 12. Scales Reliability**

| Construct | Cronbach's Alpha |
|---|---|
| Innovativeness Room | .930 |
| Innovativeness Bathroom | .938 |
| Typicality Room | .890 |
| Typicality Bathroom | .883 |
| Fluency | .737 |
| Interest | .911 |
| Pleasure | .930 |
| Booking Intentions | .910 |
| Travel expertise | .755 |
| Utilitarian | .889 |
| Hedonic | .928 |

### 2.4.5. Hypotheses Testing

The six hypotheses were tested using independent sample t-test and Process Macro for the mediations and moderations. First the scenarios were recoded whereas the MAYA principle was reflected in innovative room and typical bathroom and typical room and innovative bathroom.

To test hypotheses H1 and independent sample t test was utilized, to understand if the scenario with high innovativeness and high typicality leads to more favorable booking intentions. There was a significant difference in scores for booking intentions in the MAYA scenario ($M = 4.84$, $SD = 1.38$) as opposed to the other scenarios ($M = 3.46$, $SD = 1.00$), $t(197) = 8.06$, $p < .001$ booking intentions being higher when placed in the MAYA scenario in **support of H1**.

To test H2, where travel goal (utilitarian vs hedonic) was used as a moderator for the booking intentions Process Macro model 2 was utilized. The continuous variables were mean centered to reduce any effects of multi collinearity. Bootstrapping was carried out with a sample size of 5000. The overall model was significant $F(5, 193) = 19.339$, $p < .001$, $R^2 = .334$,. The

interaction between the scenario and hedonic travel goals was not significant $b = -.23$, $t(193) = -1.33$, $p = .186$. Unstandardized indirect effects were computed for each of 5,000 bootstrapped samples, and the 95% confidence interval was computed by determining the indirect effects at the 2.5th and 97.5th percentiles. The bootstrapped unstandardized indirect effect for pleasure was .254, and the 95% confidence interval ranged from -.576 to .113. Furthermore, the interaction between the scenario and the utilitarian travel goal was significant $b = .398$, $t(193) = 2.086$, $p = .038$.

As shown in Table 13, travel goal significantly moderated the effect of the MAYA scenario on booking intentions. More specifically, the more utilitarian goal the higher the willingness to book the hotel room and bathroom combination that followed the MAYA principle. This interaction effects are illustrated in Figure 1 and Figure 2. The interaction was probed by testing the conditional effects of MAYA scenario at three levels of utilitarian and hedonic, one standard deviation below the mean, at the mean, and one standard deviation above the mean. As shown in Table 14 presents the conditional effects of the MAYA principal scenarios at the values of the moderators (One SD below the mean, at the mean, and one SD above the mean). All interaction were significant with the expectation of the Hedonic moderator at a value of one standard deviation above the mean when the utilitarian moderator is at one standard deviation below the mean ($p = .102$). The more utilitarian the goal is the higher booking intentions for the MAYA scenario while the more hedonic the goal is the lower the booking intentions for the MAYA scenario, in **partial support of H2**.

**Table 13. Moderating Effect of Travel Goal**

| Predictor | β | t | p | 95% CI | |
|---|---|---|---|---|---|
| MAYA Scenario | 1.403 | 6.84 | .001 | .999 | 1.81 |
| Hedonic | -.025 | -.291 | .771 | -.195 | .145 |
| Interaction (MAYA x Hedonic) | -.232 | -1.33 | .196 | -.576 | .113 |
| Utilitarian | .229 | 1.68 | .094 | -.039 | .497 |

| Interaction (MAYA x Utilitarian) | .398 | 2.09 | .038 | .022 | .774 |
|---|---|---|---|---|---|

MAYA = Most advanced yet acceptable design

**Table 14. Conditional Effects of MAYA Scenario on Booking Intentions**

| Hedonic | Utilitarian | β | p | 95% CI | |
|---|---|---|---|---|---|
| One *SD* below mean | One *SD* below mean | 1.34 | .000 | .779 | 1.91 |
| One *SD* below mean | At the mean | 1.72 | .000 | 1.19 | 2.24 |
| One *SD* below mean | One *SD* above mean | 2.09 | .000 | 1.41 | 2.78 |
| At the mean | One *SD* below mean | 1.03 | .003 | .472 | 1.59 |
| At the mean | At the mean | 1.40 | .000 | .999 | 1.81 |
| At the mean | One *SD* above mean | 1.78 | .000 | 1.26 | 2.29 |
| One *SD* above mean | One *SD* below mean | .721 | .102 | -.144 | 1.58 |
| One *SD* above mean | At the mean | 1.09 | .003 | .386 | 1.79 |
| One *SD* above mean | One *SD* above mean | 1.46 | .001 | .756 | 2.17 |
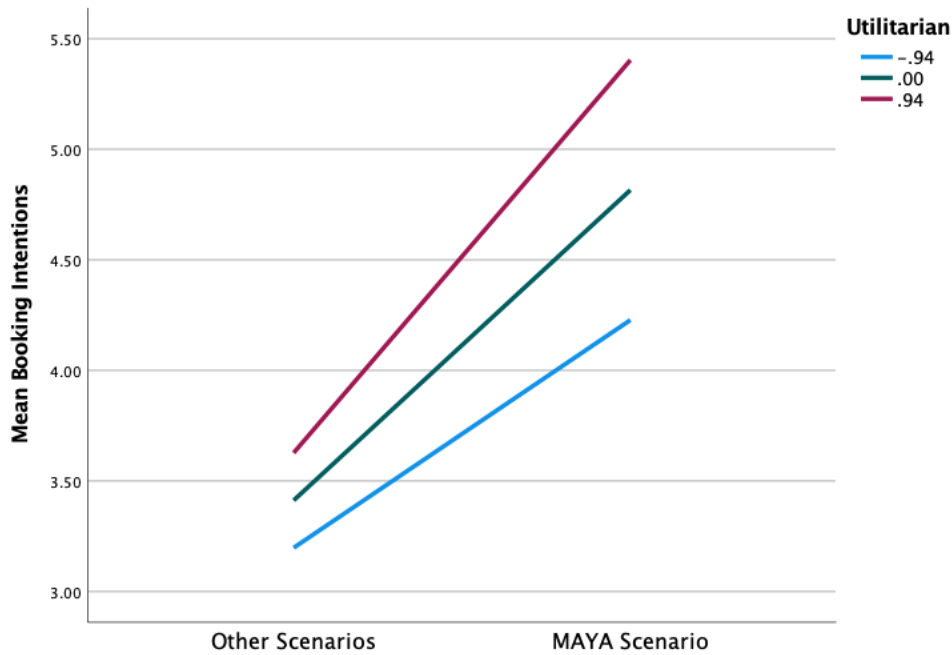


**Figure 3. Moderating Effects of Utilitarian Trip Goal**
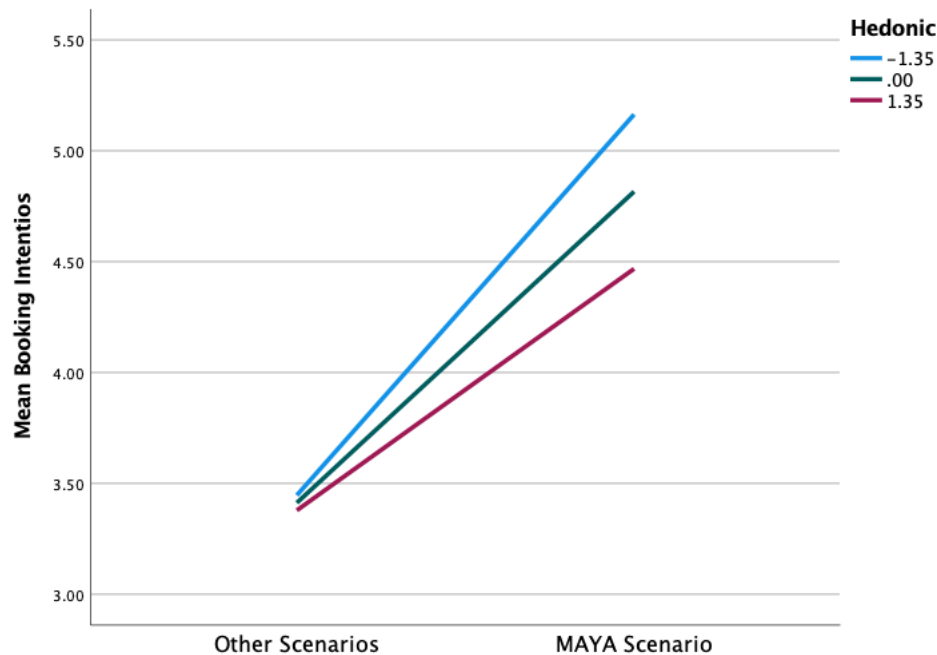
**Figure 4. Moderating Effects of Hedonic Trip Goal**

To test H3, where travel expertise (experienced traveler vs un-experienced travels) was used as a moderator for the booking intentions Process Macro model 1 was utilized. The continuous variables were mean centered to reduce any effects of multi collinearity. Bootstrapping was carried out with a sample size of 5000. The overall model was significant $F(3,195) = 61.25$, $p < .001$, $R^2 = .485$,. The interaction between the scenario and travel expertise was significant $b = .902$, $t(195) = 6.12$, $p < .001$.

As shown in Table 15, travel goal expertise significantly moderated the effect of the MAYA scenario on booking intentions. More specifically, the more expertise the higher the willingness to book the hotel room and bathroom combination that followed the MAYA principle. This interaction effect is illustrated in Figure 3. The interaction was probed by testing the conditional effects of MAYA scenario at three levels of travel expertise, one standard deviation below the mean, at the mean, and one standard deviation above the mean. As shown in

Table 16 presents the conditional effects of the MAYA principal scenarios at the values of the moderators (One SD below the mean, at the mean, and one SD above the mean). All interaction were significant with the expectation of the one standard deviation above the mean (p = .116). In **partial support of H3** the less experienced the traveler the lower the willingness to book the MAYA scenario.

**Table 15. Moderating Effect of Travel Goal**

| Predictor | β | t | p | 95% CI | |
|---|---|---|---|---|---|
| MAYA Scenario | 1.25 | 8.63 | .000 | .961 | 1.53 |
| Travel experience | -.071 | -.599 | .548 | -.304 | .163 |
| Interaction (MAYA x Travel Exp) | .902 | 6.12 | .000 | .612 | 1.19 |

MAYA = Most advanced yet acceptable design
Travel Exp = Travel Experience

**Table 16. Conditional Effects of MAYA Scenario on Booking Intentions**

| Travel Expertise | β | p | 95% CI | |
|---|---|---|---|---|
| One *SD* below mean | .322 | .116 | -.080 | .724 |
| At the mean | 1.24 | .000 | .961 | 1.53 |
| One *SD* above mean | 2.17 | .000 | 1.75 | 2.59 |
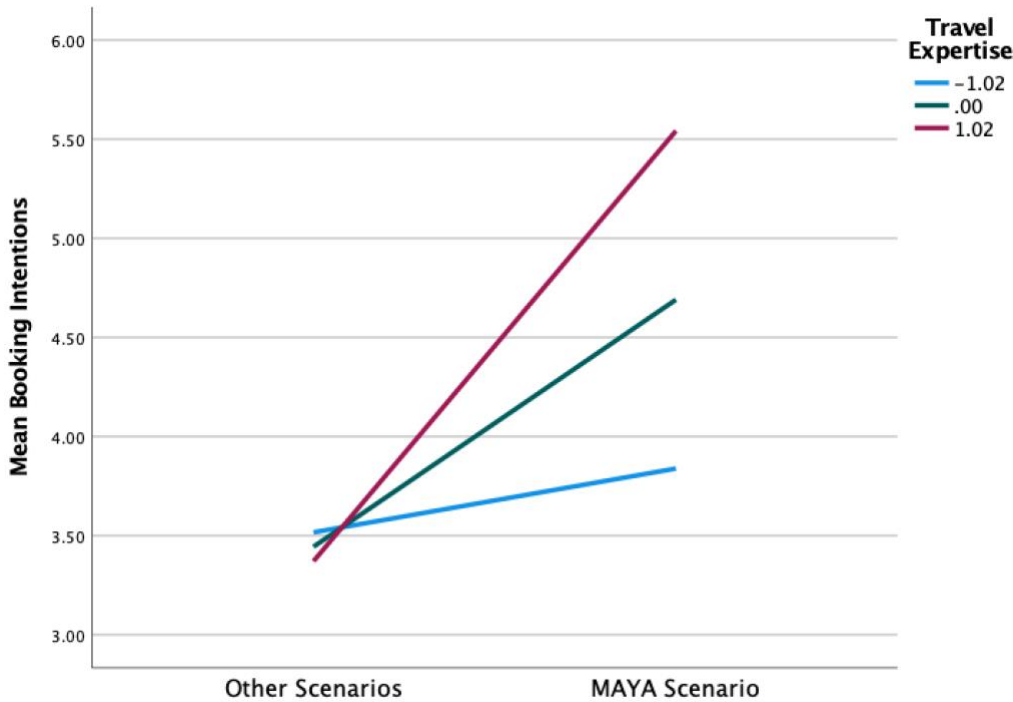
**Figure 5. Moderating Effects of Travel Expertise**

To test weather pleasure H4a and interest H4b mediated the effects of typicality and innovativeness on booking intentions, Process Macro version 4.0 and model 4 was utilized. The overall model was significant $F(1, 197) = 29.95$, $p < .001$, $R^2 = .263$. The regression of innovativeness on the booking intentions was not significant $b = .120$, $t(197) = 1.56$, $p = .121$. Moreover, the regression of pleasure on booking intentions was significant, $b = .423$, $t(197) = 7.64$, $p < .001$. Unstandardized indirect effects were computed for each of 5,000 bootstrapped samples, and the 95% confidence interval was computed by determining the indirect effects at the 2.5th and 97.5th percentiles. The bootstrapped unstandardized indirect effect for pleasure was .135, and the 95% confidence interval ranged from .048 to .244. Furthermore, the direct effect was not significant $p = .121$, we can conclude that pleasure fully mediated the relationship between innovative design and booking intentions. When testing the typical design, the overall model was significant $F(1, 197) = 34.93$, $p < .001$, $R^2 = .263$. The regression of typicality on

booking intentions was not significant $b = .108$, $t(197) = 1.54$, $p = .125$. Moreover, the regression of pleasure on booking intentions was significant $b = .43$, $t(197) = 7.89$, $p < .001$. Unstandardized indirect effects were computed for each of 5,000 bootstrapped samples, and the 95% confidence interval was computed by determining the indirect effects at the 2.5th and 97.5th percentiles. The bootstrapped unstandardized indirect effect for pleasure was .083, and the 95% confidence interval ranged from .009 to .166. Furthermore, the direct effect was not significant $p = .125$, we can conclude that pleasure fully mediated the relationship between typical design and booking intentions. Considering these results **H4a is supported**.

In terms of interest as a mediator, the overall model was significant for the innovative design $F(1,197) = 15.46$, $p < .001$, $R^2 = .073$. The regression of innovative design on the booking intentions was not significant $b = .109$, $t(197) = 1.38$, $p = .173$. Moreover, the regression of interest on booking intentions was significant, $b = .370$, $t(197) = 6.70$, $p < .001$. Unstandardized indirect effects were computed for each of 5,000 bootstrapped samples, and the 95% confidence interval was computed by determining the indirect effects at the 2.5th and 97.5th percentiles. The bootstrapped unstandardized indirect effect for interest was .145, and the 95% confidence interval ranged from .066 to .245. Furthermore, the direct effect was not significant $p = .173$, we can conclude that interest fully mediated the relationship between innovative design and booking intentions. When testing the typical design, the overall model was significant $F(1, 197) = 3.37$, $p = .068$, $R^2 = .017$. The regression of typicality on booking intentions was not significant $b = .126$, $t(197) = 1.76$, $p = .081$. Moreover, the regression of interest on booking intentions was significant $b = .28$, $t(197) = 7.08$, $p < .001$. Unstandardized indirect effects were computed for each of 5,000 bootstrapped samples, and the 95% confidence interval was computed by determining the indirect effects at the 2.5th and 97.5th percentiles. The bootstrapped

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unstandardized indirect effect for interest was .066 and the 95% confidence interval ranged from .008 to .139. Furthermore, the direct effect was not significant $p = .081$, we can conclude that interest fully mediated the relationship between typical design and booking intentions. Considering these results **H4b is supported**.

Process Macro model 4 was further utilized to test H5: Fluency will mediate the effects of typicality and innovativeness in upper midscale hotel interior designs on pleasure. The overall model was not significant $F(1,197) = .008$, $p = .930$, $R^2 = .000$. The regression of innovative design on pleasure was significant $b = .314$, $t(197) = 3.69$, $p < .005$. Moreover, the regression of fluency on pleasure was significant, $b = -.66$, $t(197) = -7.63$, $p < .001$. Unstandardized indirect effects were computed for each of 5,000 bootstrapped samples, and the 95% confidence interval was computed by determining the indirect effects at the 2.5th and 97.5th percentiles. The bootstrapped unstandardized indirect effect for fluency was .004, and the 95% confidence interval ranged from -.096 to .108. Furthermore, the direct effect was significant $p < .005$, we can conclude that there is not enough evidence to support an indirect effect. Further testing was conducted with the typical design. The overall model was no significant $F(1,197) = .771$, $p = .381$, $R^2 = .039$. The regression of typical design on pleasure was marginally significant $b = .157$, $t(197) = 1.95$, $p = .053$. Moreover, the regression of fluency on pleasure was significant, $b = -.65$, $t(197) = -7.33$, $p < .001$. Unstandardized indirect effects were computed for each of 5,000 bootstrapped samples, and the 95% confidence interval was computed by determining the indirect effects at the 2.5th and 97.5th percentiles. The bootstrapped unstandardized indirect effect for fluency was .037, and the 95% confidence interval ranged from -.046 to .126. Furthermore, the direct effect was marginally significant $p = .053$, we can conclude that there is not enough evidence to support an indirect effect, and therefore **H5 is rejected.**

Similarly, H6 was tested using Process Macro model 4. The overall model was not significant for innovativeness $F(1,197) = .008$, $p = .930$, $R^2 = .000$ nor for typicality $F(1,197) = .772$, $p = .381$, $R^2 = .004$. Neither direct effects nor indirect effects were significant and therefore **H6 is rejected**.

The table below presents all the hypotheses and their support:

**Table 17: Hypotheses Testing**

| Hypotheses | Support |
|---|---|
| H1: Booking intentions are more favorable for upper-midscale hotel interior designs with high innovativeness and high typicality (the most advanced yet acceptable design) as compared to other combinations. | Supported |
| H2: Compared to other design combinations, the most advanced yet acceptable upper midscale hotel interior design will result in more favorable booking intentions for utilitarian rather than hedonic goals in hotel reservations. | Partially Supported |
| H3: Travel experience will moderate the relationship between the design type and booking intentions, such that the most advanced yet acceptable design will result in more favorable booking intentions for experienced travelers rather than non-experienced. | Partially Supported |
| H4a: Consumer pleasure will mediate the effects of typicality and innovativeness in upper midscale hotel interior designs on booking intentions. | Supported |
| H4b: Consumer interest will mediate the effects of typicality and innovativeness in upper midscale hotel interior designs on booking intentions. | Supported |
| H5: Fluency will mediate the effects of typicality and innovativeness on pleasure in upper midscale hotel interior design. | Rejected |
| H6: Disfluency will mediate the effects of typicality and innovativeness on interest in upper midscale hotel interior designs | Rejected |

## 2.5. Discussion

The current study aimed to provide a holistic understanding on how the fluency of mental processing associated with the typicality and innovativeness of the hotel room and bathroom design of an upper midscale hotel impacts pleasure and interests, which in turn leads to booking

intention. The study was rooted in the Pleasure-Interest Model of Aesthetic Liking (PIA) (Graf & Landwehr, 2017) and the Most Advanced Yet Acceptable (MAYA) principle (Hekkert et al., 2003) of design. Overall booking intentions were higher for the upper midscale hotel room and bathroom scenario guided by the MAYA principle, compared to any other combination. Moreover, travel expertise and travel goals moderated the relationship between the design type and booking intentions, whereas the scenario designed on the MAYA principal led to higher booking intentions for the experienced traveler as well as for the utilitarian goal of traveling. Furthermore, this study pointed out that consumer pleasure and interest mediated the effects of typicality and innovativeness in the designs on booking intentions. However, fluency and disfluency did not mediate the effects of typicality and innovativeness on pleasure and interest.

The findings confirm that when the room scenario (hotel room and bathroom) follow the MAYA principle, the booking intentions are significantly higher. These results are in line with previous studies (Crilly et al., 2009; Spence & Gallace, et al., 2011, Park et al., 2013, Helmefalk & Hulten, 2017), where the importance of the look and feel of a product play an important role in consumer behavioral intentions.

Travel goal significantly moderated the effect of the MAYA scenario on booking intentions, where the travelers with utilitarian goals reported higher booking intentions that those with hedonic goals for the MAYA scenario. As discussed in previous studies, consumer attitudes are formed in two dimensions: utilitarian and hedonic (Voss et al., 2003). As argued by Gursoy et al. (2006) when one's travel goal is more hedonic, there is a desire for product uniqueness, having more symbolic and emotional meaning whereas utilitarian is characterized as functional and task oriented (Dhar & Wertenbroch, 2000). This finding accentuates on the importance of travel goal and the desire of booking a hotel room based on that travel goal. The results being in

line with Volz & Volgger (2022) that tourism and hospitality products are seen as hedonic, but also that it is useful to follow a differentiated approach in targeting customers with different travel goals. For example, based on the current evidence, it is plausible to target your potential audience based on your hotel room and bathroom designs.

Travel experience also significantly moderated the effect of the MAYA scenario on booking intentions, where experienced traveler reported higher booking intentions than unexperienced travelers. These results are in line with the PIA Model (Graf & Landwwehr, 2005), where an observer processes with more ease a stimulus when preexisting knowledge structures are available, in the current case previous experience with traveling. Moreover, previous studies discussed that travel experience leads to more product expertise and therefore familiarity and a change in evolution of the product. Moreover, these findings are also in line with Graf & Landwehr (2017). According to previous studies (Dedeoglu et al., 2015; Jang & Namkung, 2009) pleasure and interest with the stimuli lead to behavioral intentions. These results add to the growing body of knowledge of emotions impacting decision making (Adam et al., 2016; Aaker et al., 2004). These results also corroborate the proposition that aesthetic liking and design attractiveness are dual constructs triggered by both pleasure and interest. Moreover, the results suggest that consumer emotions (pleasure and interest) are a mediating factor in the purchasing process (Sherman et al., 1998) as well as influencing various dimensions of the purchase behavior. Lastly, the level of typicality and innovativeness can also distinguish the product/service from another, more so when the innovativeness is higher as it can stimulate consumer interest (Celhay & Trinquecoste. 2015).

Fluency and disfluency did not act as mediators for pleasure and interest respectively. These results being contradictory with the fluency framework proposed by Reber et al. (2004).

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For an observer to experience fluency or disfluency the visual properties and past experiences play an important role; moreover, the perceiver should not attribute their reaction to a different source. Perhaps in the current case the participants considered the hotel room as a commodity and were focusing on different aspect of the room and bathroom rather than the scenario. Previous literature in fluency and disfluency has mainly investigated objects (Im et al., 2010; Flavell et al., 2020; Winkielman et al., 2003), whereas in the current study the participants were tased to perceive an environment which requires significantly more cognitive work (McClelland et al., 2004). Moreover, fluency can be influenced by not only the information rate but also Gestalt principles that are available in the environment (van Dijk et al., 2010) which was not controlled for. Moreover, Reber and colleagues (2004) further discuss that the fluency may act as a mediator for pleasure with fluency is unexpected in the context. The created scenarios resembled real hotel rooms; it is possible that the images did not elicit high levels of pleasure due to their expected levels of fluency. These results were similar to Im et al. (2020) in the context of e-retailers for clothing.

### 2.5.1. Theoretical Implications

This study adds to the body of knowledge by showcasing empirical support for the importance of the physical environment in upper midscale hotels as well as the impact on consumer behavioral intentions. Moreover, it advances the understanding of a dual-processing theory in a hospitality context, especially fluency, which in the past has focused on consumer processing of advertising (Lee & Labroo, 2004), products (Hekkert et al., 2003), and packaging (Orth & Malkewitz, 2012). Although the impact of physical environment and room design, in general, has been considered in several studies (Bogicevic et al., 2018; Hua et al., 2009, Singh & Band, 2021), it has not been the major factor but rather an antecedent of satisfaction, loyalty, and

retention (Hua et al., 2009). Furthermore, previous studies have only considered public areas of hotels or rooms (Bogicevic et al., 2018), while the current study also considers the hotel bathroom, offering a realistic scenario of booking a hotel. The results explain the process mechanism involved in processing innovative and typical hotel rooms and bathrooms on response behaviors. Moreover, to the best knowledge of the authors, the MAYA principle has not yet been investigated in hospitality context, however it has been present in apparel design (Ceballos et al., 2019), retail design (Quartier et al., 2021), interior design (Chang et al., 2020), and aesthetics research in general (Post et al., 2016). Hence, the current results expand the MAYA principle in hospitality research, setting a steppingstone for future research.

The literature body indicates that the physical environment, and the hotel room in general play an integral role in booking intentions (Amin et al., 2021). However, a limited number of studies within the hospitality context has analyzed in depth how the type of design is impacting the consumer, especially when booking intentions are considered. Moreover, the current study investigated how the MAYA principle (most advanced yet acceptable design) leads to booking intentions. Therefore, the main contribution of this finding is not only expanding the MAYA principles in the hospitality context, but also accentuating on the importance of the logic that consumers prefer a balanced mixed between the typicality and innovativeness of design. Furthermore, this finding also emphasizes that design principles of objects can spill over into the physical environment as well. Additional this study also confirms Hekkert's et al. (2003) MAYA principle (most advanced yet acceptable design). Through this study the relationship between the MAYA scenario and booking intentions was also confirmed. Moreover, majority of studies which focused on hotel physical environment, used a perception-based survey, and focused only on the hotel public areas or the hotel room, whereas the current study used a custom created

realistic picture-based scenario where both the hotel room and bathroom were utilized. Previous studies have focused on travelers' overall booking intentions, without distinguishing between utilitarian and hedonic goals as it is in the case of this study. In a greater context, the current results also point out the importance of travel goals, utilitarian and hedonic, on booking intentions.

To the best of the authors knowledge, the current study differentiated experienced from non-experienced travelers booking intentions and it did so by integrating the MAYA principle as well. Consistent with the hypotheses, the findings support those experienced travelers will be more inclined to booking the MAYA scenario as opposed to the other ones. These results are also confirming that secondary factors such as prior experience (Chiu & Lin, 2011) may influence the use of information sources and understanding, indicating that secondary factors do play an important role in consumer behavior. Additionally, while previous studies have investigated pre-travel behavior of experienced travelers such as task-oriented processes (Eletxigerra et al., 2021), travel information search (Teichmann, 2011) or online community behavior (Hochmeister et al., 2013), the current study investigated the behavioral intentions when presented with a specific hotel design based on their expertise, adding to the cycle of knowledge of pre-travel research and behavior.

The results also supported that consumer pleasure and interest mediated the effects of typicality and innovativeness in the hotel room and bathroom designs on booking intentions. These findings provide further evidence in support of the PIA model, as well as expanding this dual processing theory into a hospitality context. Moreover, these findings are also in line with Graf & Landwehr (2017). According to previous studies (Dedeoglu et al., 2015; Jang & Namkung, 2009) pleasure and interest with the stimuli lead to behavioral intentions. These

results add to the growing body of knowledge of emotions impacting decision making (Adam et al., 2016; Aaker et al., 2004). Lastly, the findings offer a better understanding on how the product form and combination can influence consumer response, as well as shedding light on how the MAYA principles varies across different goals and expertise.

### 2.5.2. *Practical Implications*

Hoteliers invest considerable capital in the overall look of a hotel, especially in the overall room, as it is more or less the most important aspect when one books a hotel. Being aware of the impact of different design combination and finding the exact one that drive customers to book is highly important to overall hotel financial wellbeing and could very well be rooted in overall satisfaction with the hotel offerings as well. The supported relationship between the MAYA scenario and the travel goals has significant practical implications in terms of customer targeting and offerings directly tying into advertising and marketing. Moreover, hoteliers can take into consideration their current clientele base and decide whether or not their rooms and bathrooms need an upgrade, and if yes, to what extent. Additionally, the current study also offers hoteliers a strategy through which they can maximize their sales. An additional question could be asked before booking the hotel to understand if the travel is for hedonic or utilitarian purposes and offer the rooms for booking accordingly. The dual processing theory used sheds light for practitioners; depending on the room and bathroom appearance customers experience different levels of processing fluency which can make a difference on the motivation to process further and eventually end up booking the room. Therefore, it is suggested that hotel brands, use caution when investing in their room and bathroom designs, as even simple shapes of the mirrors, room shape, and bed, can have verry different outcomes depending on the experience of the customer as well as their travel goal. Lastly, the current study sheds light on

the division of upper midscale hotels, which although is one of the most popular booked hotel type, limited research has been dedicated in the literature when it comes to design, as most studies have focused on luxury properties. The results can also serve as a suggestion for hoteliers to pay close attention to individual characteristics of their customers and engineer their visual environment accordingly.

### 2.5.3. Limitations

Although this research has significant theoretical and practical implications, it is not free of limitations. As the study only focused on upper midscale hotel room and bathroom, the narrow focus can be considered as a limitation as the results can only be applied to this context. The current study used a scenario to understand customer behavior intentions, where customers had to rely on imagery to determine their booking intentions. Although there is a plethora of such set up for consumer behavior research, real life situations may differ from scenarios. Moreover, as the data was collected only on US consumers, the generalization of the results may call for a more diverse sample size with different approaches. As this study utilized a self-report instrument, social desirability bias could have affected objectivity of the sample. Furthermore, the current study did not measure participants previous knowledge on design types and experience and their effects thereof. Lastly, data was collected through Amazon's Mturk, as a result, certain limitations such as lack of control, deceptive response, and rushed responses are considered limitations of the current study.

### 2.5.4. Future Research

The current research could also include other areas of the hotel such as public areas, elevators, corridors, and not only the hotel room and bathroom. Even though the trip goal and

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expertise were considered as moderators, future research could look at clear differences between business and leisure travelers as well as travelling with and without children. Moreover, future research could also consider brand awareness and how does it affect fluency of the hotel room and bathroom. Future studies could also look at various focal points in the images, to understand what aspects of the hotel room and bathroom grab more attention. The experiment could be created as a mock online booking site with the images to mimic a real-life online booking scenario. Lastly, future studies could also conduct the experiment by means of EEG, to overcome the measurement of fluency, as more precise measurements can be takes as well as the duration of the different stages of perception.

## 2.6. Conclusion

This study investigated how the fluency of mental processing associated with the typicality and innovativeness of the hotel room and bathroom design of an upper midscale hotel impacts pleasure and interests, which in turn leads to booking intention. The Pleasure-Interest Model of Aesthetic Liking (PIA) (Graf & Landwehr, 2017) was used as the underlying theoretical backbone and the Most Advanced Yet Acceptable (MAYA) principle (Hekkert et al., 2003) of design was used to develop the hotel room and bathroom scenarios. As a result, the booking intentions were higher for the upper midscale hotel room and bathroom scenario that followed the MAYA principle compared to any other combination. Moreover, travel expertise and travel goals moderated the relationship between the design type and booking intentions. The scenario designed on the MAYA principal led to higher booking intentions for the experienced traveler as well as for the utilitarian goal of traveling. This study also pointed out that consumer pleasure and interest mediated the effects of typicality and innovativeness on booking intentions.

However, fluency and disfluency did not mediate the effects of typicality and innovativeness on

pleasure and interest.

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## Chapter 3. Article 3. Bringing Nature in: The Effect of Biophilic Design on Health-Conscious Consumers

### 3.1. Introduction

The hospitality industry is becoming increasingly involved in innovation when it comes to design, turning the hotel into an experience for travelers. Half of the world's population lives in urban environments (54%), with an estimated growth to 66% by 2050; humans spend 93% of the time indoors separated from natural elements (Gillis, 2018). Studies show that being away from nature for extended periods is stressful for the human body, therefore a contemporary solution for this is biophilic design, as it brings the benefits of natural elements indoors (Samir, 2021). Biophilic design is using elements from the natural world into the built environment. However, biophilic design involves a more holistic approach towards the built environment where not just the inclusion of plants is involved but other elements as well, such as sound, water, and lighting that mimic the natural environment (Kellert et al., 2008). Biophilia is among one of the key movements in hospitality design today (Taylor, 2019), as consumers are in continuous pursuit of spending quality time in surroundings that benefit their physical wellbeing and mental contentment. This trend is increasingly helping hotels to differentiate themselves as well as creating a unique experience, as the service environment is an important element of the marketing mix. Biophilia has attracted the attention of researchers in many areas such as office spaces (e.g., Gray & Birell 2014; Hähn et al., 2020; Nieuwenhuis et al., 2014; Sanchez et al., 2018; Yin et al., 2020), hotels (e.g. Abreu 2015; Lee 2019; Mishra & Gupta, 2018; Nanu et al., 2020), retail (e.g., Joyce et al., 2010; Rosenbaum et al., 2018; Rosenbaum et al., 2019) educational environment (e.g., Ebbini 2021; Han, 2018; Kellert 2015; Lee & Park, 2018), and urban environment (e.g., Berto et al., 2015; Browning, 2018; Downton et al., 2017; Newman,

2013; Xue et al. 2019); with focus and findings revolving around the restorative and health properties of biophilic design, both physical and psychological. However, only a scant number of articles have focused on hotel biophilic design in the context of hotel lobbies, indicating the need to further explore the potential of this topic. The hotel lobby serves as the epicenter of a hotel, playing an essential role in forming first impressions, where guests get their first taste of the rest of the building (Curtis, 2003). Most often these first impressions are based on the physical environment (Schmitt, 2004). Recent trends have transformed the hotel lobbies in "living-room" types of places, offering guest a home away from home feeling (Frochot et al., 2019). Living in a tech-dominant world, recent interior design trends dictate a strong swing towards natural materials and organic forms, using nature a muse to bridge the physical and emotional gap between indoors and outdoors (Brammer, 2020).

As many studies emphasize on the health benefits of biophilic design (e.g., Joye, 2007; Purani & Kumar, 2017; Rosenbaum et al., 2018; Ryan et al., 2014; Soderlund & Newman, 2015), health-conscious guests would potentially be more inclined to patronize such hotels. According to Kraft and Goodell (1993) consumers who lead a wellness-oriented lifestyle are not only concerned with nutrition and fitness but also their surrounding environment. The current study will focus on health-conscious guests and their propensity to spend and feel peace of mind in a biophilic design. Where peace of mind can be defined as an affective well-being and is characterized by internal peace and harmony. Based on previous research on biophilic design and its impacts on the human body, the current study will further investigate how and if it can influence health-conscious consumers' peace of mind. Moreover, there is a lack of research on emotional effects affecting behavioral intentions in a service environment (Bigné et al., 2005). As consumers interact with service environment during their consumption experience,

understanding their effective responses becomes a pivotal aspect in their entire experience (Zinz, 2002). Drawing from the Pleasure-Arousal Theory, and the effects of biophilic design, the purpose of this study is to understand how the emotional experience of hotel guests impacts their willingness to pay more and feel internal peace and harmony in the form of peace of mind. Moreover, the current study also aims to understand if health consciousness plays a role in the guests' emotional experience when biophilic design is present.

The current study will have significant theoretical and practical contribution. From a theoretical perspective, the current study is focusing on guests' subjective experiences and integrating cognitive and emotional concepts to explain behavioral intentions as well as internal states. Moreover, the current study will be integrating the raising trend of biophilic design within the hospitality industry. From a practical standpoint the current study will have significant managerial implications by offering practitioners a way to differentiate themselves through biophilic design. Numerous studies on biophilic design indicate that the presence of natural elements increase endorphins which will in turn increase the feeling of well-being. As humans have an affinity towards natural elements, guests would want to stay near the lobby bar and dining areas thus increasing the guest check average. Biophilic design also supports the guest positive attitude toward the hotel and potentially may increases future bookings. Word of mouth advertising should increase and thus increasing RevPAR and Occupancy Rate. This type design will more than likely catch the eye of locals and potentially increase hotel traffic as. Overall increasing the hotel's bottom line. The current study will further guide practitioners on how to capitalize on health-conscious guests.

## 3.2. Literature Review

### 3.2.1. Theoretical Background

### 3.2.1.1. Pleasure-Arousal Theory (PAT)

The Pleasure-Arousal Theory (PAT) (Russel, 1980) and Russell et al., (1989) has been developed as a psychological model emerging from the Pleasure-Arousal-Dominance Theory (Mehrabian & Russell, 1974), and has been examined by numerous researchers as theories of affective experiential states (Yang et al., 2020). Originated in the work of Wundt (1980), PAT is part of the class of dimensional theories of emotional experience (Izard & Buechler, 1971), representing an "empirical consensus" on the structure of emotions. According to PAT the "effective core" of emotional experience can be described by two continuous, bipolar, and orthogonal dimension, pleasure-displeasure (P) and arousal-sleep or activation-deactivation (A) (Reisenzein, 1994). For better understanding, the visual model is included in Figure 3. Russell (1980) explains that pleasure and arousal represent the hedonic tone and activation. Previous studies have treated the three main effective dimensions of pleasure, arousal, and dominance, as their independent variables, however, more and more studies (Massara et al., 2021, Miniero et al., 2014) indicate that pleasure and arousal underline the spectrum of emotional experiences. Pleasure is defined as the degree to which a person feels good, or happy in a situation, whereas arousal is related to the extent to which a person feels stimulated and active (Bigné et al. 2005). Following previous studies, dominance was excluded from the research model (Jeon et al., 2016). Several researchers explained that the dominance dimension and its outcome has not been completely understood (Yang et al., 2020). Moreover, Kuamr et al. (2014) concluded that dominance is an outcome of pleasure or arousal. The current study assumes that arousal and pleasure interact in an affective state (Miniero et al., 2014) and furthermore, arousal influences

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pleasure (Chebat & Pratt, 1980), which further leads to behavioral response. In a hospitality context, several studies reveal the impact of several dimension of the servicescape on pleasure and arousal, however, the magnitude of the impact differs. Lin (2010) concluded that pleasure and arousal in the context of hotels visual servicescape directly influenced satisfaction and indirectly mediated the relationship between visual servicescape aesthetics comprehension and appreciation and satisfaction. While in the context of restaurants the servicescape was found to influence pleasure and arousal which further influenced customers' behavioral intentions (Ellen & Zhang, 2014). Also, in the context of airports, Moon et al. (2015) found that three components of the physical environment had effects on pleasure but were insignificant on arousal. As with previous studies pleasure and arousal will be used to explain how individuals' appraisal of a servicescape reflects their subsequent cognitive schema.

*3.2.2. Biophilic Design*

The notion of biophilia had originally been introduced by Erich Fromm, a philosopher, and social psychologist, however, the affiliation between emotions and life-like processes has become popular in 1984 by the biologist Edward O. Wilson (Joye, 2011). According to Ryan et al. (2014, p. 62) "biophilia is the deep-seated need for humans to connect with nature". Biophilic design is using elements from the natural world such as plants, sounds, water, and lighting into the built environment (Kellert et al., 2008). The contact with nature plays an important role in humans' physical and mental well-being (Xue et al., 2019), furthermore, biophilic design has been found to have restorative potential on humans (Rosenbaum, 2019). According to Kellert (2008) and Wilson and Kellert (2013), the biophilia hypothesis explains that although people have been living in an urban setting for centuries now, and have been removed from natural processes and elements, the urge to affiliate with nature remains as it is in our genes.

Biophilic hotel design is a relatively new concept within hospitality research.

Practitioners and environmental psychology scholars have started to be more and more interested

in this concept, however, more empirical research needs to be done that includes commercial

landscapes as well (Lee, 2019). Biophilic design has received a lot of attention in architecture

and urban development contexts (e.g., Berto et al., 2015; Newman, 2013; Downton et al., 2017;

Reeve et al., 2012). Biophilic design was implemented in a different context as well, such as

children's environments (Derr & Lance, 2012; Derr & Kellert, 2013), prisons, improving mental

health in prisons through biophilic design (Soderlund & Newman, 2017), and office employees

(Gray & Birrell, 2014). Although biophilic design is an emerging trend that has received

attention in the media and by practitioners, as well as other fields, it has received very little

empirical attention in the context of hotels (Lee, 2019). Therefore, the current research aims to

shed more light on the implications of biophilic design and hotels, guided by the benefits of

natural elements.

The theories on the psychological benefits of nature originate from environmental

psychology and are based on the restorative effects of nature on humans (Gillis & Gatersleben,

2015). In a study conducted by Derr and Kellert (2013), the authors point out that exposure to

biophilic design in the classroom led to increased attention capacities, cognitive functions, and

increased social and creative play. In a similar study, the incorporation of biophilic design in

office spaces increased productivity, decreased stress, and enhanced the well-being of employees

(Gray & Birrell, 2014). In a study of lean versus green office spaces, Nieuwenhuis et al. (2014)

point out that green office spaces improved the performance of workers and increased their

positive mood. In a different study, Soderlund and Newman (2017) looked into the biophilic

design impact in prisons and theorized on the potential to improve mental health and well-being of inmates which would potentially lead to the reduction of recidivism, overall increasing their level of humanity. Rosenabaum et al. (2018) explored biophilic design in the context of lifestyle centers and explained that consumers perceived this kind of design as having restorative properties, treating symptoms related to burnout and fatigue. Purani and Kuamar (2017) discuss in their study the benefits brought by biophilic design on attention and mood in the context of several servicescapes from a hospital lobby, upscale restaurant, spa, and bank lobby.

Several studies point out the positive influence of biophilic design on consumer emotions and buying behaviors (Brengman et al., 2012; Purani and Kumar, 2017, Lee, 2019; Rosenbaum et al. 2018). Wang et al. (2019) researched the restorative quality in tourist hotel marketing pictures and concluded that customers have more visual attention to images that have nature clues than those without as well as perceive them as having higher restorative quality. Although the framework of linking servicescapes stimuli to customers' behavioral responses has been widely applied (Booms & Bitner, 1982, Hightower et al., 2002), the impact of biophilic design as an element of the servicescape has received little attention (Purani & Kumar, 2017). In the literature, physical attributes have been found to directly impact the customer's responses to the environment (Lee, 2019). Mclaughlin (2017) explains that hotels which included natural elements and plants in their ambiance discovered that more guests were using these areas and the return rate was higher. Additionally, according to Heath (2018), guests prefer to spend more time in biophilic lobbies than in regular ones, which can translate into increased spending in the hotel. According to Gupta et al. (2019), interior design that incorporated natural elements helped towards building consumer trust. Lastly, in a similar study by Tifferet and Vilnai-Yavetz (2017) having plants as a stimulus in a retail context, enhanced pleasure, increased perceived service

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quality as well as service satisfaction. Overall, the concept of biophilic design can improve a hotel's image on a multitude of levels, and therefore it is important to be taken into consideration from an empirical perspective. The current study will be approaching biophilic design as plants situated in a hotel lobby. These natural elements will be included in the hotel lobby physical environment, therefore facilitating the connection with nature for the consumers.

### 3.2.3. The Relationship Between Biophilic Design, Arousal, and Pleasure

Biophilia theories suggest that due to the early exposure of humans to natural elements, an emotional response has been developed and nurtured to these natural stimuli. Even though humans spend extensive amounts of times indoors, the brain mechanism from our ancestors are still maintained, and therefore the exposure to natural elements still evoke and emotional response. In a study conducted by Tifferet and Vilnai-Yavetz (2017) having plants in a retail setting enhanced pleasure as opposed to no plants. Moreover Lee (2019) demonstrated in their study that customers experience more pleasure and arousal in biophilic hotel settings, however, pleasure was more impacted than arousal. Studies have consistently shown that the contact with nature elevates mood (Barbiero & Berto, 2021; Thompson & Bruk-Lee, 2019), moreover, plants create fresh air to breath (Lohr & Pearson-Mims, 2000) and sunlight triggers serotonin (Papadopoulo et al., 2005) both of which relate to positive arousal. Furthermore, nature has the unique ability to not only arouse but also relax at the same time (Taylor, 2021). Kaplan and Talbot (1983) described in their study that natural environments facilitate the flow of experiences as arousal is stimulated. While Hung and Chang (2021) demonstrated in their study that biophilic design lead to feelings of emotions, pleasure, restoration and feelings of relaxation, as well as increase cognitive performance. Based on the Pleasure-Arousal Theory (Russell, 1980) consumers emotions (pleasure and arousal) will be triggered by the physical environment, as it

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explains the first level of response to the environment. Moreover, Russel (1980) and Russell et al., (1989) explain that people are affected by the environmental stimuli which can cause emotional states. Based on the circumplex of emotions diagram (Figure 3), biophilic design is situated in the lower right quadrant, as the presence of plants increase pleasure and lower arousal. Considering the presented literature, the following hypotheses are proposed:
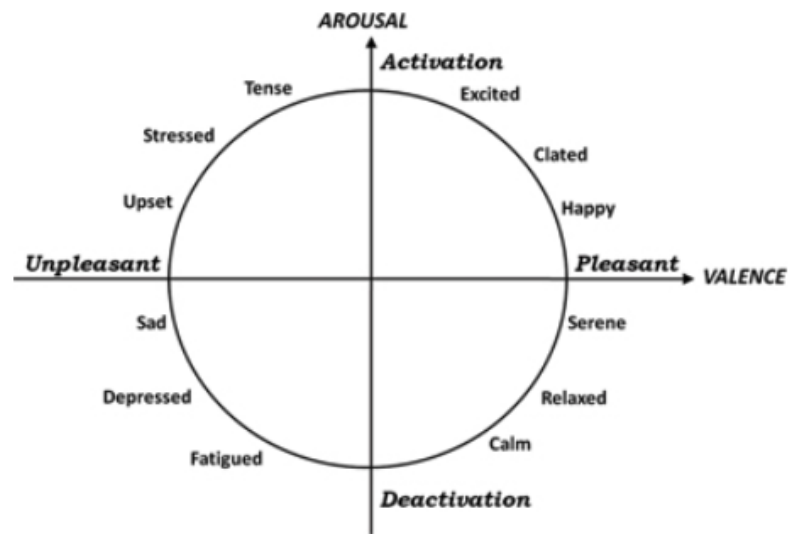


**Figure 6. Circumplex of Emotions**

**H1a**: The biophilic design will lead to higher level of pleasure than non-biophilic design

**H1b**: The biophilic design will lead to lower-level arousal than non-biophilic design

In a study conducted by Russel and Pratt (1980) pleasure and arousal were found to be independent dimensions. However, in a different study by Russell et al. (1989), pleasure and arousal were found to be interrelated in a highly systematic way. The authors found that although pleasure and arousal are conceptually distinct, they were positively correlated when the affective states of the two occurred with equal signs (e.g., + on pleasure and + on arousal). While later one

Berlyne (1973) and (1974) hypothesized that arousal influenced pleasure, through 12 studies where volunteers respond to art and music as well as in one instance to words. Berlyne (1974) determines pleasures in two ways, by increasing arousal to the pleasurable state, or decreasing arousal when it became too intense. Several other marketing studies have verified the relationship between arousal and pleasure (e.g., Babin & Attaway, 2000, Chebat & Michon, 2003). Babin and Attaway (2000) investigated pleasure and arousal through shopping affect in a retail setting. While Chebat and Michon (2003) investigated the impact of ambient odors on mall shoppers' concluding that arousal influenced pleasure. Lastly, in a tourism setting Bigné et al. (2005) investigated pleasure and arousal in a theme park experience, concluding that positive arousal stimulated visitor pleasure. Hence, the following hypothesis is proposed:

**H2:** The arousal state will significantly and positively influence the pleasure state

*3.2.4. Mediating Role of Pleasure and Arousal*

*3.2.4.1. Willingness to Pay More*

Willingness to pay or WTP is defined as the highest amount a customer is willing to pay for a product or service (Ayadi & Lapeyre, 2016). Furthermore, it is the excess amount paid over the "fair" prices that is justified by the "true" value of the product (Wang et al., 2009). Wertenbroch and Skiera (2002), emphasize the importance of willingness to to pay in designing optimal pricing. Researchers in the hospitality industry have focused on willingness to pay more in relation to hotel attributes. Tu et al. (2018), looked into co-creation and willingness to pay more as well as how willingness to pay more is affected by customer engagement; Kuminoff et al. (2010) focused on hotel green amenities and prices for a standard room in a green hotel; a similar study conducted by Lopez-Sanchez et al. (2014) explored environmental friendly properties and the impact on willingness to pay more ; and Wong and Kim (2012) researched

willingness to pay more in regards to views from hotel rooms. Having the information about which factor motivate consumers to spend more is key for business survival (Mutlu et al., 2017). Furthermore, paying a higher price for goods or services that support a specific lifestyle has been quantified in dollars by several research (Auger et al., 2003). Li et al. (2012) explains that willingness for consumers to pay for products or services reflects their purchasing intentions and may even be a direct antecedent of brand purchasing behavior. Furthermore, based on previous studies on health-conscious consumers are willing to pay more for products and services that are in line with their views.

### 3.2.4.2. Peace of Mind

Over the last decade extensive empirical attention has been dedicated to mindfulness and subjective well-being (Collar et al., 2008). More than often the concept of "well-being" has been studied in the field of psychology and defined under western worldviews (Richard & Edward, 2001). More recently, societies have become more aware of other cultures' views of well-being and the importance of nature in enhancing it (Ekman et al., 2005) Hence Lee et al. (2012) further explore the term peace of mind (PoM) which can be defined as an affective well-being and is characterized by internal peace and harmony. Furthermore, in a study conducted by Otto and Ritchie (1996) in the context of hotels and airlines, peace of mind was one of the most important factors, as well as when it came to tours and attractions. Moreover, Chen and Chen (2010), Cole and Scott (2004), and Fernandez and Cruz (2016) also indicated that among other variables peace of mind also played an important role in the context of theme parks and tourism, overall impacting the experience quality.

According to Oh et al. (2019) peace of mind is related to the physical and psychological feeling of security and comfort. Being surrounded by natural elements such as light pools, and

greenery leads to the feelings of security (Kellert, 2008), moreover, a well-balanced transition between the built and natural environment also fosters comfort. Kellert (1993) further adds that the aesthetic response to nature is associated with the feelings of tranquility and peace of mind. In a study conducted by Brengman et al. (2012) in the context of retail stores, surrounding greenery led to feelings of pleasure as evoked by the store environment. According to numerous scholars, willingness to pay more occurs when guest positively evaluate their experience, in the current case the biophilic lobby, and therefore are willing to pay more (Zeithaml et al., 1996; Bigné et al., 2005). Numerous empirical studies pointed out that service environments such as dining (Ryu & Jang, 2007) or hotels (Lee, 2019) influence behavioral intentions through emotions. Moreover, according to PAT pleasure and arousal represent the staple of emotions as affected by the environment, and they act as the mediating factor between environmental cues and behavior (Chebat & Muchon, 2003).

Moreover, several studies discussed the strong effect of pleasure and arousal in hedonic contexts rather than utilitarian (Jiand and Wang, 2006). Donovan and Rossiter (1994) indicate in their study that pleasure creates the willingness to purchase, while arousal acts on the desire to interact, leading to a behavioral intention. Hence, the current study proposes that the biophilic design will lead to pleasure and arousal which in turn will influence the behavioral intention of willingness to pay more and the internal peace and well-being, characterized as peace of mind. The following hypotheses are proposed:

**H3**: Pleasure and arousal will both partially mediate the effects of biophilic design on willingness to pay more, such as higher pleasure in the presence of biophilic design (a) and lower arousal (b).

**H4**: Pleasure and arousal will both partially mediate the effects of biophilic design on

peace of mind, such as higher pleasure in the presence of biophilic design (a) and

lower arousal(b)

*3.2.3. The Relationship Between Peace of Mind and WTP*

Peace of mind includes internal states of peacefulness together with harmony (Lee et al., 2013), and recent empirical research concluded that inner peace and harmony are central to well-being (Sikka et al., 2018). Several studies show that biophilic design creates a visual and emotional affiliation with nature, leading to inner peace and harmony (Barbiero & Berto, 2021). While willingness to pay more can be defined as the highest amount one is willing to pay for a service or product (Ayadi & Lapeyre, 2016). Previous studies have shown that when consumers are concerned about specific aspects such as health or the environment, their willingness to pay more for products and services that are in line with their beliefs or that tend to their beliefs, is higher (Kanf et al., 2012). In terms of health, the natural environment alleviates stress (Rosenbaum, 2009), and gives consumer s restorative feeling (Rosenbaum et al., 2016). Several researchers have pointed out that when consumers perceive a high level of restorative experience, they are more likely to spend time and money (e.g., Kaplan & Kaplan, 1989; Rosenbaum, 2009).  According to Rosenbaum (2018) consumers are willing to pay more for a restorative environment because they want to feel the internal peace and harmony, brought by the restorative effect. Based on the above discussion the following hypothesis is proposed:


**H5**: Peace of mind will significantly and positively affect willingness to pay more

*3.2.4. Health Consciousness*

According to Becker et al. (1977), health consciousness analyzes the readiness of consumers to undertake health actions. The health-conscious consumers are not only aware of their state of well-being but also motivated to improve and maintain it (Newsom et al., 2005). Newsom et al. (2004) also discuss that health-related motivation is the primary cause related to health behavior, however, knowledge plays an important part as well. Becker et al. (1977) identified three components in the readiness to undertake health actions: health motivations, perceived threats posed by illnesses and conditions, and the perceived probability that the threat will be reduced if the behavior is a complaint. Furthermore, Lee et al. (2014) explain that health-conscious individuals are concerned for their health and more interested to improve and/or maintain it.

The health-conscious consumer has been rising in the tourism industry and otherwise ("Wellness Trends to Watch in 2019", 2019), and there is a need for more empirical studies in this ever-growing trend as health is a multidimensional concept (Karn & Swain, 2017). There has been an abundance of studies on health consciousness and food choices; looking into intentions towards organic food (e.g., Akhondan et al. 2015; Her & Seo, 2017; Kriwy & Mecking, 2012; Mei & Hoffman, 2012; Michaelidou & Hassan, 2007), attitudes towards organic food (Chen, 2009); purchase behavior of organic food (Kriwy & Mecking, 2011), food labeling (Ellison et al., 2013), and the influence of organic food choices on subsequent food choices (Shin & Mattila, et al., 2019). Overall, the literature focusing on food choices points out that health consciousness plays an important role in informed decisions. Gould (1988) points out that health-conscious people have a more favorable attitude towards health maintaining activities.

In hospitality and tourism research most studies focus on the concept of wellness and wellness tourism. The wellness travelers seek destinations that provide physical fitness options,

healthy diets and weight management, beauty treatments and meditation (Karn & Swain, 2017). However, according to Iversen and Kraft (2006), health consciousness is not related to levels of exercise and jogging but is a way of living. According to Moorman and Matulich (1993) health-conscious individuals are very active in the search of health information, and they also engage in healthy behaviors. In addition, Cho et al. (2014), explain that health-conscious consumers are more likely to be interested in a diverse range of health-related information.

Overall research points out that health consciousness is an important element in the motivation to stay healthy (Hong, 2011), and therefore people who express high health consciousness are more likely to engage in cognition and behaviors that maintain their health levels (Chang, 2019). Currently, although researchers have investigated wellness tourism and destinations, as well as motivation for wellness tourists (Damijanic, 2019), there have been limited studies focusing on health consciousness and hotels. Based on the provided literature, the current study will be approaching health consciousness as the state where consumers are not only aware of their well-being but also motivated to improve and maintain it.

*3.2.4.1. Moderating Role of Health Consciousness*

Health-conscious consumers lead a "wellness-oriented" lifestyle and are aware of their general wellbeing as well as motivated to maintain it (Shin & Matilla, 2019). According to Stress Recovery Theory proposed by Ulrich et al. (1991), non-threatening natural environments are not only restorative, but also lead to more positive emotional sates as well as decreased psychological arousal. Health-conscious individuals are concerned about wellness (Hao & Chenyue, 2021) as well as are motivated to engage in healthy actions (Yadav & Pathak, 2016) and obtain health information and prefer healthy products (Naylor et al., 2009). There is an abundance of studies that indicate the health benefits of biophilic design, not only from a

physical perspective but also from a mental one (Thomas & Xing, 2021). And therefore, health-conscious guests will not only naturally achieve peace of mind by simply looking at the natural environment but will do so due to the associated health benefits. Furthermore, health-conscious consumers have been found to spend more to maintain their lifestyle (Japutra et al., 2021). According to Wardle and Steptoe (2013) health consciousness pushes consumers to engage in behaviors that maintain or improve their health.

When striving to reach ones' goal, being health conscious in the current case, emotions arise (Hurt et al., 2005). When maintaining a goal is dependent in taking an action, positive emotions are evoked. Moreover, these emotions may further facilitate cognitive processing. In other words, consumers that identify as health conscious would devote more attention and dedicate more efforts to process relevant information (Federoff et al., 1977). Depending on whether the consumer is health conscious or not, the biophilic design lobby will be evaluated differently and the relationship between pleasure, arousal, and willingness to pay more will vary. For health-conscious consumers, the presence of plants, is more likely to lead to positive arousal and pleasure, which will lead to an increase in peace of mind. Likewise, health-conscious consumers will have more positive behavioral intention to pay so they may enjoy the health benefits and the serenity of spending time surrounded by the natural environment while being indoors. Based on these notions the following hypotheses are suggested:

**H6:** Health consciousness will strengthen the relationship between biophilic design and peace of mind.

**H7**: Health consciousness will strengthen the relationship between biophilic design and willingness to pay more.
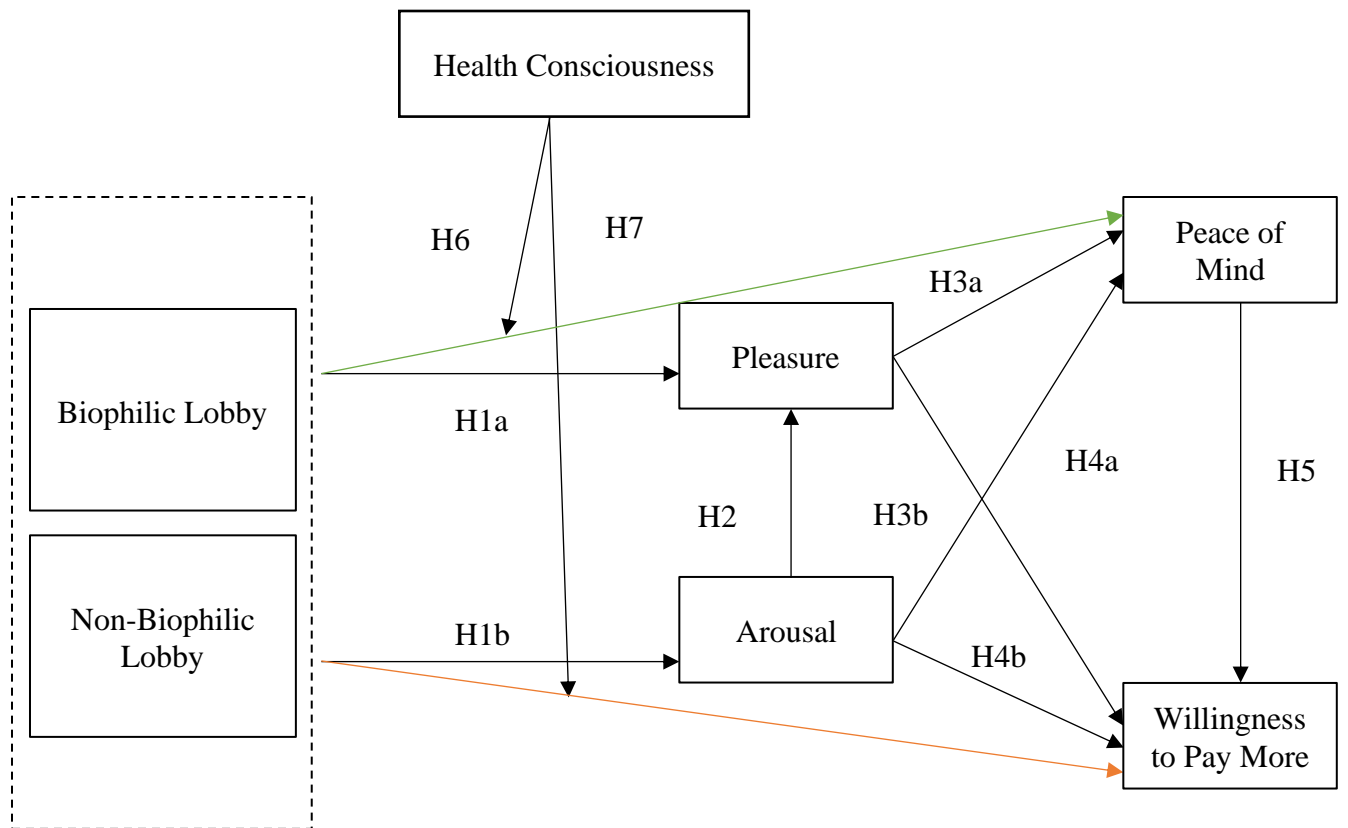
**Figure 7. Model Study 3**

## 3.3. Methods

### 3.3.1. Research Design

This quantitative study is designed as an online scenario-based experiment. This study used biophilic design lobby vs non biophilic design lobby between-subjects experimental design. An additional art lobby was also implemented, to offer a diverse focal point. Participants were randomly assigned to one of the three experimental conditions. The questionnaire was posted on the Qualtrics platform and distributed online via Amazon Mechanical Turk (Mturk). Prior research has indicated that Mturk is an appropriate tool to reach a diverse demographic. Moreover, it offers an inexpensive data collection method that yields reliable results (Lu et al.,

2021). In addition, Mturk has been widely adopted in the field of hospitality and tourism for data collection (e.g., Jeong & Lee, 2017; Kim & Baker, 2020; Shin & Matilla, 2020). To improve response quality the guidance of Lu et al. (2021) on how to improve response quality by using Mturk for data collection was followed. Participants were placed in one of the three scenarios. To ensure quality of data several steps were taken such as implementing pre-qualifying questions, asking the date of birth of the participants at the beginning and at the end of the survey, asking participants to fill two text boxes briefly describing what they look for in a hotel room and what is the name of the last hotel they have stayed at. Additionally, several attention check questions were placed in the survey as well.

*3.3.2. Stimulus Development*

Each scenario began with the following description:

*"Imagine you are planning a trip within the USA, and while searching to book a hotel, the following lobby design is presented. Please look carefully at the presented lobby picture as the questions below will be measuring your opinion on this picture*."

The scenario will be accompanied by one of the three experimental conditions. The current research will develop its own stimuli to portray the hotel lobby with and without biophilic design. Previous research has shown that online imagery allows users to perceive the stimulus as having similar properties to physical space (Lee & Kozar, 2009). Additionally, Kort et al. (2006) and Lee (2019) pointed out in the studies that images of natural elements shown on computers can be a surrogate to those elements.

The stimuli were developed by a professional, based on two real hotel lobby pictures of a upper-midscale hotel. Both images will demonstrate the interior space of the lobby with furniture. Both images will be subjected to photo editing to induce biophilic elements in the

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photographs, examples of biophilic design can be found in Appendix. Participants will be shown one of the manipulated scenarios followed by an understanding check and two manipulation check questions. The understanding check question will assess respondents' understanding of the task presented to them in the scenario. The manipulation check questions will measure participants' perceptions of the presence of plants (Nanu et al., 2020). A pilot study will be conducted with a sample of personal contacts to check instrument reliability and conduct pre-test manipulations.

### 3.3.3. Measurements

All items will be adapted from previous studies to ensure validity. As the current study follows an experimental design, to ensure validity 10 -15 people per measurement item should be recruited (Hair et al., 2010). Since this study has 23 measurement items, at least 300 participants are to be recruited to account for incomplete surveys. The participants will be required to be at least 19 years old and have booked a hotel in the past year, so they may be familiar with the process of online booking.  Measurement scales can be found in Table 18 with alpha levels based on the cited studies.

**Table 18. Original Measurements**

| Construct | Measurement items | Source | α | Scale |
|---|---|---|---|---|
| Health Consciousness | Living life in the best possible health is very important to me | Dutta-Bergman (2004) | .72 | 1 (strongly disagreed) to 5 (strongly agree |
| | Eating right, exercising, and taking preventive measures will keep me healthy for life | | | |
| | My health depends on how well I take care of myself | | | |
| | I actively try to prevent disease and illness | | | |
| | I do everything I can to stay healthy | | | |
| Willingness to Pay More | I would pay more to stay at a hotel that | Kang et al. (2012) | N/A | 1 (strongly disagreed) to 5 |

| | | | | |
|---|---|---|---|---|
| | I would be willing to pay ____% extra to stay at a hotel that has biophilic design in the lobby (response options are: 0%, 1–5%, 6–10%, 11–15%, 16–20%, and more than 20%) | | | (strongly agree |
| Peace of Mind | My mind is free and at ease | Lee et al. (2013) | .90 | 1 = Not at all |
| | I feel content and comfortable with myself in daily life | | | 2 = Some of the time |
| | My lifestyle gives me feelings of peace and stability | | | 3 = Often |
| | I have peace and harmony in my mind | | | 4 = Most of the time |
| | The way I live brings me feelings of peace and comfort | | | 5 = All the time |
| Pleasure | Happy – Unhappy<br>Pleased – Annoyed<br>Satisfied – Unsatisfied<br>Contented – Melancholic<br>Hopeful – Despairing<br>Relaxed – Bored | Mehrabian & Russell (1974) | .93 | 5-point semantic differential scale |
| Arousal | Cheerful – Depressed<br>Enthusiastic – Calm<br>Active – Passive<br>Surprised – Indifferent | Bigné et al. (2005) | .80 | 5-point semantic differential scale |

## 3.4. Findings and Analysis

### 3.4.1. Manipulation Check Experiment Scenario Pilot

Previous research using experimental conditions has recommended using manipulation checks (Lee, 2019; Nanu et al., 2020). An independent sample t-test was conducted to check if the manipulations were successful. Participants in the biophilic design condition ($M = 1.83$, $SD = 1.23$) rated higher on the manipulation check question than those in control condition ($M = 1.66$, $SD = 1.13$); $t(86) = 37.99$; $p < .001$). As such, the manipulation checks were successful.

### 3.4.2. Sample Description

A sample of 500 participants was collected using Mturk Master List. However, only 221 responses were usable as the rest failed the pre-qualification questions and the various attention

check questions. The survey started with a pre-qualifying question, followed by a text box answer. Participants were also asked their age at the beginning and end of the survey. Hence, the failure of any of these checks rendered those answers unusable. Similar numbers of males (48.9%) and females (51.2%) participated in the study. Many of the participants were between 35 and 44 years old (34.4%) followed by 25 to 34 years old (32.1%). The educational level of the participants varied, however, the most frequently reported educational level was bachelor's degree (62.4%), followed by master' degree (14%). Almost all participants (95.9%) were employed. Most participants (62.4%) traveled for pleasure, while only 10.8% traveled for business; 26.8% traveled for both. Slightly over one-half of the participants (56.5%) traveled 1-3 times per year, 33.4% traveled 4-7 times per year, while only 10.1% traveled more than 8 times per year. Table 2 presents the demographic profile of the respondents. A higher percentage of the participants travelled for pleasure (48.4%) as opposed to business (32.6%), or a mix between the two (19%). In terms of income, 18.1% received an income of $40.000 - $49.999, 15.4% received an income of $50.000 - $59.000 while 12.7% received an income of $30.000 - $39.999. More details information on the demographic characteristic of the participants can be found in table 19.

**Table 19. Characteristics of Participants**

| Variable | Values | % | Variable | Values | % |
|---|---|---|---|---|---|
| **Gender** | Male | 48.9 | **Occupation** | Management, professional, and related | 38.9 |
| | Female | 51.1 | | Service | 14 |
| | | | | Sales and office | 26.2 |
| **Age** | 18-24 years old | 3.2 | | Farming, fishing, and forestry | .9 |
| | 25-34 years old | 32.1 | | Construction, extraction, and maintenance | 6.3 |
| | 35-44 years old | 34.4 | | Production, transportation, and material moving | 5.4 |
| | 45-54 years old | 18.1 | | Government | 4.1 |
| | 55-64 years old | 11.3 | | Retired | .5 |
| | 65+ years old | 9 | | Unemployed | 3.6 |
| **Marital Status** | Married | 70.1 | **Education** | High school graduate (high school diploma or equivalent including GED) | 4.5 |
| | Widowed | 1.4 | | | |
| | Divorced | 6.8 | | | |
| | Never married | 21.7 | | Some college but no degree | 9 |

| | | | | | |
|---|---|---|---|---|---|
| | | | | Associate degree in college (2-year) | 8.6 |
| | | | | Bachelor's degree in college (4-year) | 62.4 |
| **Income** | Less than $10,000 | 2.7 | | Master's degree | 14 |
| | $10,000 to $19,999 | 4.1 | | Doctoral degree | 1.4 |
| | $20,000 to $29,999 | 8.1 | | | |
| | $30,000 to $39,999 | 12.7 | **Travel** | Pleasure | 48.4 |
| | $40,000 to $49,999 | 18.1 | | Business | 32.6 |
| | $50,000 to $59,999 | 15.4 | | Mixed | 19 |
| | $60,000 to $69,999 | 10.9 | | | |
| | $70,000 to $79,999 | 9.5 | | | |
| | $80,000 to $89,999 | 5.0 | | | |
| | $90,000 to $99,999 | 5.4 | | | |
| | $100,000 to $149,999 | 6.3 | | | |
| | $150,000 or more | 1.8 | | | |

N = 221

### 3.4.3. Reliability

The reliability of the constructs was tested through SPSS's scale reliability analysis. Hair et al. (2010) states Alpha Cronbach's value above 0.7 is considered reliable and acceptable index (Nunnally & Bernstein, 1994). As shown in Table 20, the findings confirm that all the variables are valid and reliable.

**Table 20. Scales Reliability**

| Construct | Cronbach's Alpha |
|---|---|
| Peace of Mind | .961 |
| Willingness to Pay | .879 |
| Pleasure | .905 |
| Arousal | .817 |
| Health Consciousness | .770 |

### 3.4.4. Manipulation check

As recommended by previous studies (e.g., Purani and Kumar (2018), Tifferet and Vilni-yavets (2017), and Lee et al. (2019)), the experimental manipulations were assessed. The manipulation checks showed significant differences in the expected directions. An independent-samples t-test revealed that the participants who were placed in the biophilic design scenario identified that the lobby design they were presented with had significantly more plants ($M =$

5.89, $SD$ = 1.04) compared to the participants placed in the scenario without plants ($M$ = 2.97, $SD$ = 2.22), $t(169)$ = -11,23, $p$ <.001. Furthermore, participants were also placed in another control scenario with an additional focal point of art on the walls. The participants successfully identified that the lobby presented had significantly more plants ($M$ = 5.89, $SD$ = 1.04) compare to the participants placed in the art lobby without plants ($M$ = 5.12, $SD$ = 1.76), $t(140)$ = 3.28, $p$ = .001.

*3.4.5. Hypotheses Testing*

The seven hypotheses were tested using independent sample t-test, linear regression, and Process Macro for the mediations. To test hypotheses H1a and H1b and independent sample t test was utilized, to understand if the presence of biophilic design leads to higher level of pleasure and lower level of arousal. There was a significant difference in scores for Pleasure in the biophilic lobby ($M$ = 5.55, $SD$ = .92) as opposed to the non-biophilic lobby ($M$ = 3.39, $SD$ = .71), $t(169)$ = -16.89, $p$ < .001 pleasure being higher when placed in the biophilic lobby in **support of H1a.** Furthermore, there was a significance difference in scored for Arousal in the biophilic lobby ($M$ = 3.69, $SD$ = .82) as opposed to the non-biophilic lobby ($M$ = 4.93, $SD$ = 1.06), $t(169)$ = 8.56, $p$ < .001 arousal being lower when placed in the biophilic lobby **supporting hypothesis H1b**. Further testing was also done for the additional focal point of lobby with art. There was no significance difference in arousal between the biophilic lobby ($M$ = 3.69, $SD$ = .82) and the art lobby ($M$ = 3.54, $SD$ = .54), $t(140)$ =1.22, $p$ = .225. However, there was a significant difference in pleasure; the biophilic lobby ($M$ = 5.56, $SD$ = .93) scored lower on pleasure than the art lobby ($M$ = 6.11, $SD$ = .75), $t(140)$ = -3.63, $p$ >.001).

To test H2, where the arousal state significantly and positively influences the pleasure state, a simple linear regression was conducted. A significant relationship was found $F(1, 219) = 43.24$, $p < .001$, with an $R^2 = .165$, **supporting H2.**

To test weather pleasure and arousal partially mediated willingness to pay more Process Macro version 4.0 and model 4 was utilized. The overall model was significant $F(1,219) = 39.02$, $p < .001$, $R^2 = .610$. The regression of pleasure on the biophilic lobby was significant $b = -.69$, $t(219) = -5.05$, $p = <.001$. Moreover, the regression of arousal on the biophilic lobby was also significant $b = 1.11$, $t(219) = 6.25$, $p = <.001$. The regressions of the willingness to pay more on the biophilic lobby $b = 2.16$, $t(217) = 16.99$, $p = <.001$, on pleasure $b = .201$, $t(217) = 4.38$, $p = <.001$, and on arousal $b = .22$, $t(217) = 3.66$, $p = .003$ were significant. The significance of this indirect effects was tested using bootstrapping procedures. Unstandardized indirect effects were computed for each of 5,000 bootstrapped samples, and the 95% confidence interval was computed by determining the indirect effects at the 2.5th and 97.5th percentiles. The bootstrapped unstandardized indirect effect for pleasure was .223, and the 95% confidence interval ranged from .121 to .342. Moreover, the indirect effect for arousal was -.151, and the 95% confidence interval ranged from -.242 to -.073. Thus, the indirect effects were statistically significant, moreover as all the direct effects were significant $p <. 001$, we can conclude that the mediation of pleasure and arousal mediated the willingness to pay, with higher pleasure and lower arousal, providing support for **H3a and H3b.**

A similar procedure was deployed to test the partial mediating effect of pleasure and arousal on the effects of the biophilic design on peace of mind. The overall model was significant $F(1,219) = 39.02$, $p < .001$, $R^2 = .151$. The regression of pleasure on the biophilic lobby was significant $b = 1.11$, $t(219) = 6.25$, $p = <.001$. Moreover, the regression of arousal on

the biophilic lobby was also significant $b = -.69$, $t(219) = -5.05$, $p = <.001$. The regressions of

peace of mind on the biophilic lobby $b = 2.65$, $t(217) = 23.17$, $p = <.001$, on pleasure $b = .234$,

$t(217) = 5.65$, $p = <.001$, and on arousal $b = .146$, $t(217) = 2.73$, $p = .006$ were significant. The

significance of this indirect effects was tested using bootstrapping procedures. Unstandardized

indirect effects were computed for each of 5,000 bootstrapped samples, and the 95% confidence

interval was computed by determining the indirect effects at the 2.5th and 97.5th percentiles. The

bootstrapped unstandardized indirect effect for pleasure was .261, and the 95% confidence

interval ranged from .096 to .237. Moreover, the indirect effect for arousal was -.063, and the

95% confidence interval ranged from -.115 to -.018. Thus, the indirect effects were statistically

significant, moreover as all the direct effects were significant $p <. 001$, we can conclude that the

mediation of pleasure and arousal mediated peace of mind, with higher pleasure and lower

arousal, providing **support for H4a and H4b**.

To test H5, where peace of mind significantly influences willingness to pay. A significant

relationship was found (F(1, 219) = 467.37, p < .001, with an $R^2 = .685$, **supporting H5**.

Hayes (2021) Process Macro 4.0 was used to examine the moderated mediation effect

proposed in H6. Education was used as a covariate to reduce the error variance. The continuous

variables were mean centered to reduce any effects of multi collinearity. Bootstrapping was

carried out with a sample size of 5000. Health Consciousness was examined as a moderator of

the mediation relationship between the biophilic design lobby and peace of mind with pleasure as

a mediator. The overall model was significant F(2, 207) = 159.03, p < .001, $R^2 = .892$,. Moreover,

the interaction was significant $b = .320$, $t(204) = 2.00$, $p <.05$. Unstandardized indirect effects

were computed for each of 5,000 bootstrapped samples, and the 95% confidence interval was

computed by determining the indirect effects at the 2.5th and 97.5th percentiles. The bootstrapped

unstandardized indirect effect for pleasure was .254, and the 95% confidence interval ranged

from .053 to .445.

As shown in Table 19, health consciousness significantly moderated the mediating effect

of the biophilic lobby on peace of mind through pleasure acting as a mediator. More specifically,

health consciousness strengthens the relationship. This interaction effect is illustrated in Figure 1.

The interaction was probed by testing the conditional effects of biophilic lobby at three levels of

health consciousness, one standard deviation below the mean, at the mean, and one standard

deviation above the mean. As shown in Table 21, the biophilic lobby was significantly related to

peace of mind when health consciousness was one standard deviation below the mean ($p < .001$),

at the mean ($p < .001$), and one standard deviation above the mean ($p < .001$), **supporting H6.**

**Table 21. Moderating Effect of health consciousness**

| Predictor | β | t | p | 95% CI | |
|---|---|---|---|---|---|
| Biophilic Lobby | .731 | .798 | .431 | -1.09 | 2.56 |
| Pleasure | .212 | 3.88 | .001 | .104 | .319 |
| Health Consciousness | -.087 | -.853 | .395 | -.286 | .113 |
| Interaction (Bioph x Health_C) | .328 | 2.033 | .043 | .009 | .646 |

Bioph = Biophilic Lobby
Health_C = Health Consciousness

**Table 22. Conditional Effects of Biophilic Lobby on Health Consciousness**

| Health Consciousness | β | p | 95% CI | |
|---|---|---|---|---|
| One *SD* below mean | 2.19 | .000 | 1.76 | 2.64 |
| At the mean | 2.48 | .000 | 2.23 | 2.73 |
| One *SD* above mean | 2.76 | .000 | 2.47 | 3.05 |
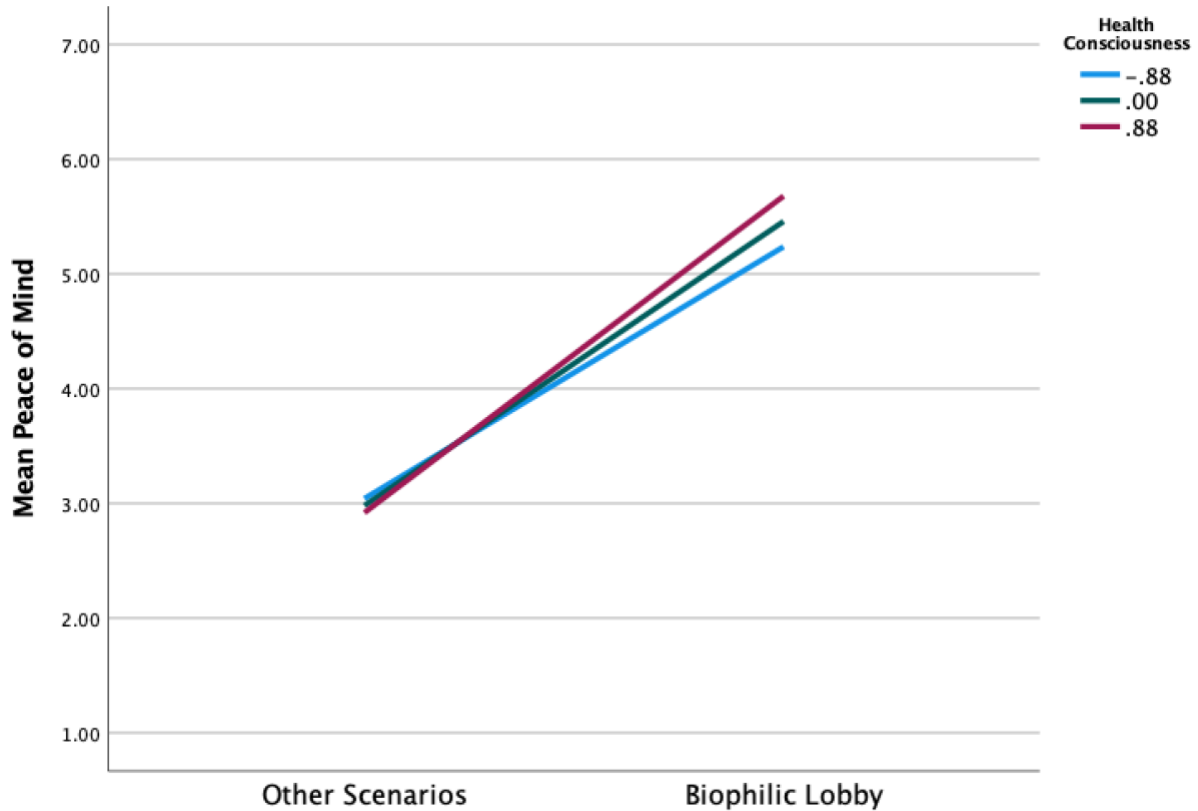
**Figure 8. Moderating Effects of Health Consciousness**

Hayes (2021) Process Macro 4.0 was used to examine the moderated mediation effect proposed in H7. The continuous variables were mean centered to reduce any effects of multi collinearity. Bootstrapping was carried out with a sample size of 5000. Health Consciousness was examined as a moderator of the mediation relationship between the biophilic design lobby and willingness to pay more with arousal as a mediator. The overall model was significant $F(2, 205) = 86.78$, $p < .001$, $R^2 = .629$. However, the interaction was not significant $b = .252$, $t(205) = 1.35$, $p = .179$, **rejecting hypothesis H7.**

The table below presents the support of the hypotheses testing:

**Table 23: Hypotheses Support**

| Hypotheses | Support |
|---|---|
| H1a: The biophilic design will lead to higher level of pleasure than non-biophilic design | Supported |

| | |
|---|---|
| H1b: The biophilic design will lead to lower-level arousal than non-biophilic design | Supported |
| H2: The arousal state will significantly and positively influence the pleasure state | Supported |
| H3: Pleasure and arousal will both partially mediate the effects of biophilic design on willingness to pay more, such as higher pleasure in the presence of biophilic design (a) and lower arousal (b). | Supported |
| H4: Pleasure and arousal will both partially mediate the effects of biophilic design on peace of mind, such as higher pleasure in the presence of biophilic design (a) and lower arousal(b) | Supported |
| H5: Peace of mind will significantly and positively affect willingness to pay more | Supported |
| H6: Health consciousness will strengthen the relationship between biophilic design and peace of mind. | Supported |
| H7: Health consciousness will strengthen the relationship between biophilic design and willingness to pay more. | Rejected |

## 3.5. Discussion

Drawing from the Pleasure-Arousal Theory (Russel, 1980), this study aimed to understand how the emotional experience of hotel guests impacts their willingness to pay more and feel peace of mind when exposed to biophilic design in a hotel lobby. Moreover, the current study also aimed to understand if health consciousness played a moderating role in the guest's emotional experiences when exposed to biophilic design. Overall, the biophilic design led to higher pleasure and lower arousal as hypothesized. Moreover, the arousal state significantly and positively influenced the pleasure state, as guided by Berlyne (1974). Furthermore, pleasure and arousal mediated the effects of biophilic design on willingness to pay, suggesting higher pleasure in the presents of plants and lower arousal. Similarly, pleasure and arousal mediated the effects of biophilic design on peace of mind. When customers experienced peace of mind it also led to a positive and significant effect of wiliness to pay more. Lastly, health consciousness strengthens the relationship between the biophilic design scenario and peace of mind however, it did not render significant for willingness to pay more.

The findings of this study reveal that biophilic design in the hotel lobby did elicit stronger positive emotions than non-biophilic design. The results showed that the biophilic environment positively and significantly affected pleasure, results that are in line with Castro et al. (2021) and Tifferet & Vilnai-Yavetz (2017). Moreover, the biophilic design reduce the levels of arousal, these results being contradictory to Lee (2019). Based on extensive literature the presence of plants and natural environments leads to lower levels of arousal as there is a calming effect (Ulrich, 1983). Moreover, psychological studies on biophilic design have proven the effects of plants in reducing stress (Dijkstra et al., 2008), lowering heart rate (Park & Mattson, 2008) and blood pressure (Hartig et al., 2003). Based on the Circumplex of Emotions (Russel, 1980) the emotional states when goes through when exposed to the natural environment and an abundance of plants, is place in the lower right quadrant where pleasure is increased, and arousal is lowered. Previous literature on biophilic design emphasizes on the calming and relaxing properties on the physical and psychological states (Ryan & Browning, 2020). A key takeaway of this result is that in consumer situations emotional triggers may be disruptive and high I emotional states (Berry et al., 2015), biophilic design might be an antidote to increase pleasure as well as manage the arousal by inducing a calm and relaxing state. These findings are also in line with Tifferet and Vilnai-Yavetz's (2017) study, where they authors found that smaller effects of arousal were found in the presence of plants. This discussion also ties into additional results of the current study where pleasure and arousal were found as partial mediators for willingness to pay more in the presence of plants. Corroborating that biophilic stimuli in the built environment influence consumer's emotional states and consumer behavior (e.g., Purani & Kumar, 2017; Rosenbaum et al., 2016).

Consumers were more willing to spend additional money to take advantage of the biophilic lobby. These results are congruent with previous studies (Silalahi et al., 2020; Tifferet and Vilnai-Yavetz's, 2017). It is no surprise that the participants were willing to pay extra for the biophilic design lobby as Homo sapiens have spent a long time in nature, and considered nature as a source of food, shelter, decoration, and medicine (e.g., Lewis, 1996; Lev et al., 2005). As such, plants had had a major impact in the quality of life. Moreover, the current study demonstrated that attributes of biophilic design are vital in driving a positive consumer response (Esan-Ojuri & You, 2021), specifically the willingness to pay more when exposed to plants. Several theoretical and empirical studies have also suggested that the visual connection with nature may have a positive impact on mood and thus on consumer responses (Soderlund & Newman, 2015), which is also further supported in the current study. Additionally, the customers also reached peace of mind in the presence of the biophilic lobby. The presence of plants also helped consumers reach peace of mind. Previous research established that peace of mind is highly related to the feelings of security and comfort at both a physical and psychological level (Oh et al., 2019). Kellert (2008) further adds that being surrounded by nature and natural elements fosters feelings and security; and Sassoon (1992) also indicates that being surrounded by plants creates a sense of calmness and serenity.

The current results also indicated that customers' willingness to pay more was indeed positively impacted by peace of mind. A plethora of studies investigated the willingness to pay more in context with green hotels and green initiatives (Kang et al., 2012; Tolnai, 2021), however, a very limited of studies investigated it in the concept of biophilic design in hotels, even though it is a growing trend (Lee, 2019). According to Cohen (2005), emotional states affect our decision, and one's willingness to pay more has not been extensively researched

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within an emotional context, however, due to the emerging field of neuroscience, this has been changing. The current study does add to the body of knowledge of the feeling of peace of mind and how it impacts one's decision to pay more for a service. Previous research indicated that consumers' moral correctness impacted their willingness to pay more when it came to natural parks, or other nature-based solutions (Lopez-Mosquera, 2016). According to Ajzen and Driver (1992) when tasked to judge a monetary value and commit a fee for their leisure activity, the respondents use heuristic or peripheral processing of information, and therefore relying on the positive or negative benefits believed to be associated with their purchase. Further research supports that when achieving an internal calmness and relaxation, peace of mind in the current case, one is more inclined to also spend more (Pham et al., 2018), in direct support of the current results. These results could also explain that relaxation leads to reduced physical pain (Baird & Sands, 2004) and therefore people experience lesser pain of payment for the service, additionality it also decreases task involvement (Pham, 1996). Overall, the current results indicated that peace of mind increase consumers' monetary valuation of booking a hotel with a biophilic lobby compared to a standard lobby.

Drawing from PAT, the arousal state significantly and positively influenced the pleasure state. These findings being in line with a plethora of previous research (e.g., Babin & Attaway, 2000; Bigné et al., 2005; Chebat & Michon, 2003). These results are also consistent with Russell and Pratt (1980) that emotions have two independent dimension, pleasure and arousal. Similar to previous studies in other hospitality contexts, arousal influences pleasures (e.g., Bigne et al., 2005; Chebat & Michon, 2003). By confirming that arousal significantly and positively influenced pleasure, these results are offering further support for PAT in general as well as expanding within a hospitality context.

Health consciousness was utilized as a moderator to strengthen the relationship between the biophilic lobby and peace of mind as well as willingness to pay. Health consciousness did strengthen the relationship between biophilic design and peace of mind through pleasure. Previous research indicated that there is a close relation between health and biophilic design (Thomas & Xing, 2021). Moreover, when one is striving to maintain a goal, emotions are evoked to further facilitate cognitive processing (Schwarz, 2002). Previous studies also shown that health-conscious consumers are aware of their health and are actively motivated to improve and maintain it as well as being self-conscious about health (Chen, 2011). The results of the current study somewhat point out that health-conscious consumers are aware of the benefits of biophilic design and hence it leads to peace of mind through pleasure. To the best knowledge of the authors this is a first attempt to use the moderating role of health consciousness on the mediated relationship between the biophilic lobby and peace of mind, therefore, advancing the body of knowledge not only from a hospitality perspective but also within the realm of wellness and wellbeing. On the other hand, health consciousness did not moderate the relationship between the biophilic lobby and willingness to pay more though arousal. Bower et al. (2003) indicated in their study that health consciousness is very influential when it comes to willingness to pay, results that are somewhat contradictory with the current study. However, in the current study health consciousness moderated the mediated relationship between the biophilic lobby and willingness to pay more through arousal. Another possible explanation could be the general effect of green color, which was predominant in the biophilic lobby. Previous studies have pointed out that green is less arousal than red (Wilson, 1966) as well as it induces withdrawal (Bagchi & Cheema., 2013). Rodas and Ahluwalia (2017) discussed in their study that when one experiences low arousal positive emotions, such as in the case of being exposed to biophilic

design, will slow down the speed of not only actions but also thoughts, which can corroborate the current results.

Studies conducted on retail shopping areas that employ biophilic design discussed that even though customers are willing to spend more and pay more in a biophilic scenario, it is not certain how much higher prices are they willing to spend, and is there really a commitment (Rosenbaum et al., 2018). Since the hotel picked for the scenario was modelled after an upper midscale hotel, the customers are considering more utilitarian purposes rather than spending time in the biophilic lobby. Lastly, perhaps the biophilic design increased the complexity of the scenario, making more difficult for the participants to take an actionable decision and process the information (Herzog & Gale, 1996).

*3.5.1. Theoretical Implications*

The current study has several contributions to the body of knowledge in the hospitality industry. First, the findings of this study contribute to the limited but growing literature of the effects of biophilic design in the context of hotels and hotel lobbies. There is a plethora of evidence of the benefits of biophilic design on emotions, quality, behavioral intentions, as well as physical and psychological benefits (Gillis & Gatersleben, 2015; Derr & Kellert, 2013, Rosenbaum et al., 2018). The lobby serves as the epicenter of the hotel, being the base of first impressions, where guests get their first taste of the building (Countryman & Jang, 2006). Even though the effects of biophilic design have been conducted in retail environments, hospitals, educational facilities, and even correction facilities, there research in a hotel setting is still underdeveloped and hence the current research is shedding more light on the concept. Second, the current study is exploring the concept of peace of mind, which although has been explored

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mainly from a western point of view, "well-being". The concept of peace of mind has not received significant attentions in the hospitality industry, however, in the field of psychology, mindfulness and wellbeing seem to attract quite a lot of empirical attentions. Therefore, the current study is exploring peace of mind within a hospitality context and in conjunction with biophilic design, whereas previous studies have focused on airlines and hotels (Otto & Ritchie, 1996), theme parks (Chen & Chen, 2010). Third, health consciousness has been explored extensively in regard to food choices (e.g., Akhondan et al. 2015, Chen, 2009; Shin and Mattila, et al., 2019), however, according to Karn and Swain (2017) health is a subdimension concepts and needs further empirical studies. The current study not only focuses on the health-conscious consumers, but it aimed to understand the role health consciences plays when participants were placed in a specific environment, which to the best knowledge of the authors is one of the first studies to do so. From a theoretical perspective, the current study is focusing on guests' subjective experiences and integrating cognitive and emotional concepts to explain behavioral intentions as well as internal states, the vast majority of previous studies focused only emotional concepts and behavioral intentions, without investigating the subjective experiences.

Even though the construct and measurement of Peace of Mind has been first explored and presented by Lee et al. (2013), the concept of a positive and harmonious state of happiness has been around for centuries, more so in the Asian culture (Tsai et al., 2006). However, to the best knowledge of the authors it has not been explored in a hotel scenario, and more so, it has not been explored in conjunction with biophilic design, therefore, the current study can serve as a pivotal point in exploring the concept of peace of mind further. Several studies investigated the positive and calming effects of biophilic design; however, the current study expands the body of knowledge by incorporating peace of mind, a reliable way to measure effective well-being.

These results also explain that effective well-being can indeed be impacted by nature in the form of visual stimuli further adding to the body of knowledge in terms of affective antecedents of peace of mind and willingness to pay.

*3.5.2. Practical Implications*

The current study also provides useful information and guidance for hotel stakeholders as they plan to change, build, or control the physical environment of the hotel. As the hotel industry is a highly competitive one, the physical environment can be used as a differentiator. More so, when there is an emphasize on physical and mental wellbeing, especially with the current Covid-19 Pandemic. Several hotel chains have changed their hotel lobbies to making them more inviting as well as creating a safe and interesting place to socialize and work. From a practical standpoint having nature in the lobby will not only make the customers want to spend more time, but by doing so they will also spend capital on food and beverages. The findings of this study can help hotel operators incorporate biophilic design in their physical environments to enhance overall guest experience as well as to increase their willingness to pay. In the spaces where guests connect with nature, they seem to feel more pleasure, less arousal and overall internal peace, which can render a positive perception of the overall hotel, perhaps more approachable behaviors, and a higher propensity of spending.

It has also been concluded that health consciousness can positively impact peace of mind through pleasure, which in turn leads to willingness to pay. Hoteliers who operate in the health and wellbeing marketing may use this to please their guests and help them achieve internal peace and relaxation while increasing their return on investment. However, the results also point out that health consciousness did not strengthen the relationship between the biophilic design and willingness to pay more through arousal. In other words, customers must achieve that relax state

to be willing to spend extra on their hotel. Overall, to enhance customers' stay and increase the hoteliers' chances of increasing their revenues while keeping the guest happy and content, the inclusion of plants in the lobby should be considered.

### 3.5.3. Limitations

The current study has several limitations that should be discussed. First, this research only focuses on one biophilic elements, plants. Moreover, the narrow focus of the study may also be considered as a limitation, as the focus was the hotel lobby, and therefore the results can only be applied to hotel lobbies to a certain extent. Additionally, the current study used scenarios to understand customers feelings and behaviors, relying on imagery. Even though experimental design with imagery has been utilized extensively in consumer behavior research, real life situations may differ from scenarios. Lastly, as data was collected from US consumers, the generalization of the results may be limited, and therefore would call for a more diverse sample of consumers. As the current study used a self-report questionnaire, social desirability bias could have affected the results, as participants could have answered dishonestly. Moreover, the current study did not investigate participants' previous knowledge of biophilic design and its benefits thereof. Lastly, this study collected data through Amazon Mturk, and even though a variety of measures were put in place for data quality, there is still a lack of control which can lead to rushed or deceptive responses.

### 3.5.4. Future Research

Future studies should include several biophilic design elements as well as perhaps using not only direct nature but also indirect nature. Additionally, future studies should perhaps explore using 3D imagery as well as videos of a hypothetical lobby to enhance the realism of the

situation. Heart rate, eye movement, skin response measurement, and image focus could also be tracked to understand what states the consumer is going through as well as whether they do focus on the biophilic design when looking at the imagery. The study should also measure whether consumer do associate biophilic design with wellness and wellbeing, or do they simply like it without underlying reasoning, therefore, future studies could benefit from understanding the processing of information route when looking at biophilic design in hotels. Moreover, future studies should also look at the complexity of the biophilic design, to understand if adding more or less, significantly impacts the ease of processing. Lastly, future studies should also investigate whether the trip purposes impact the desire to utilize the hotel lobby, and whether there is a difference when biophilic design is present.

## 3.5. Conclusion

This study aimed to understand how the emotional experience of hotel guests impacts their willingness to pay more and feel peace of mind when exposed to biophilic design in a hotel lobby. This study also used health consciousness as a moderation on guests' emotional experiences. The findings of this study reveal that biophilic design in the hotel lobby did elicit stronger positive emotions than non-biophilic design. The results showed that the biophilic environment positively and significantly affected pleasure and arousal. Moreover, the arousal state significantly and positively influenced the pleasure state, as guided by Berlyne (1974). Pleasure and arousal also mediated the effects of the biophilic lobby on willingness to pay more. Similarly, pleasure and arousal mediated the effects of biophilic design on peace of mind. When customers experienced peace of mind it also led to a positive and significant effect of wiliness to pay more. Lastly, health consciousness strengthens the relationship between the biophilic design scenario and peace of mind however, it did not render significant for willingness to pay more.

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**Chapter 4: Overarching Conclusion**

This article-based dissertation offered an overview of the physical environment research in the hospitality industry by starting off with a systematic literature review to understand what has been done in the past and how to move on in the future. The objectives of this dissertation are to understand the current state of physical environment research in the hospitality field and to identify the major gaps. Moreover, this dissertation also aims to explore the use of theories of cognitive psychology in conjunction with budget hotels and trending designs such as biophilic design. To achieve these objectives, the dissertation takes form of three independent articles which answer research questions and explores hypotheses via both qualitative and quantitative methods. The dissertation started off by investigating what has been done so far in the hospitality physical environment research, then I utilized some of the gaps and minuses in chapter two and three. Moreover, this dissertation also focused on both a public area and a private area of the hotel.

Despite the importance of the physical environment in the hospitality industry, there is still substantial room for improving not only our theoretical understanding but also practical one. This dissertation aims to add to the body of knowledge in this sense and expand both the theoretical and practical contributions as well as offering future research ideas. The first article "Physical Environment in the Hospitality Industry: 20 years of research", was a comprehensive systematic literature review that offers what research has been done in the past 20 years, identifies the gaps, and offers guidelines for future avenues of research.
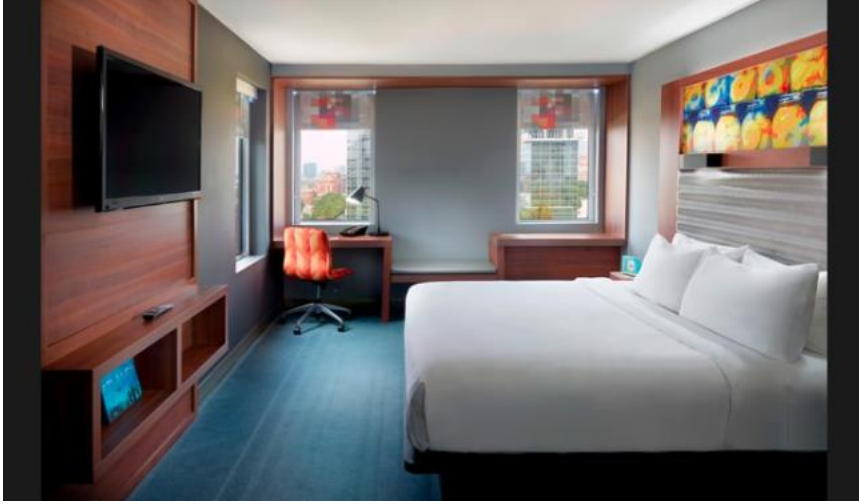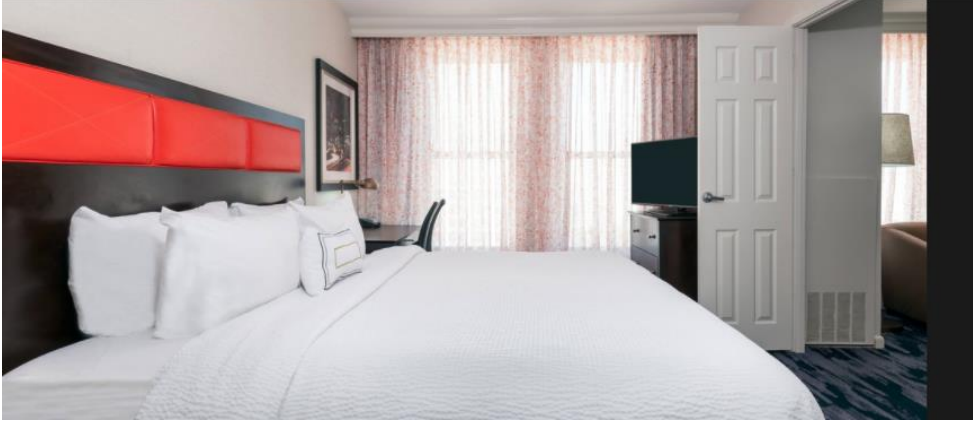
The second article "The Effect of Hotel Room Innovativeness and Typicality on Booking Intentions" uses a dual-processing model of aesthetics liking, the Pleasure-Interest Model of Aesthetic Liking (PIA) (Graf & Landwehr, 2017) in combination with the Most Advanced Yet

Acceptable (MAYA) principle (Hekkert et al., 2003), to provide a holistic understanding of how the fluency of mental processing associated with the typicality and innovativeness of a hotel room and bathroom design impacts pleasure and interest, which in turn leads to booking intentions. Moreover, this study also investigated the moderating effect of the trip goal (hedonic or utilitarian) as well as the travel expertise on the relationship between design type and booking intentions. Overall booking intentions were higher for the upper midscale hotel room and bathroom scenario compared to any other combination. The results pointed out that experienced travelers and utilitarian travelers preferred the room and bathroom design that was created based on the MAYA principle. Furthermore, this study pointed out that consumer pleasure and interest mediated the effects of typicality and innovativeness in the designs on booking intentions. However, fluency and disfluency did not mediate the effects of typicality and innovativeness on pleasure and interest.

The third article "Bringing Nature in: The Effect of Biophilic Design on Health-Conscious Consumers" investigated the impact of biophilic design in a hotel lobby on willingness to pay more and peace of mind. This study further used pleasure and arousal and mediators and health consciousness as a moderator with the lobby type and willingness to pay more as well as peace of mind. This study was rooted in the Pleasure-Arousal Theory (Russel, 1980). The results indicated that consumers were willing to pay more and achieve peace of mind when presented with the biophilic lobby as opposed to the standard lobby. Moreover, pleasure and arousal mediated the effects of biophilic design on willingness to pay, suggesting higher pleasure in the presents of plants and lower arousal. Similarly, pleasure and arousal mediated the effects of biophilic design on peace of mind. Lastly, health consciousness strengthens the

relationship between the biophilic design scenario and peace of mind however, it did not render

significant for willingness to pay.

## Appendix A – Upper Midscale Hotel Room Examples

| Hotel Name | Room Design |
|---|---|
| Aloft Hotels. |  |
| Fairfield Inn and Suites |  |

| | |
|---|---|
| Moxy Hotels |  |
| Home2 Suites by Hilton |  |
| Holiday Inn Express |  |

| Canopy by Hilton |  |
| --- | --- |
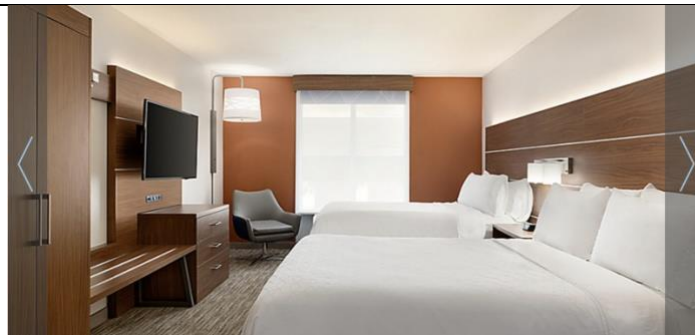
# Appendix B – Stimuli Study 2



**Figure 9. Atypical Room**



**Figure 10. Atypical Bathroom**

**Figure 11. Typical Room**


**Figure 12. Typical Bathroom**

**Appendix C - Survey Study 2**

Q2.1 Are you over 19?

    ○ Yes

    ○ No

---

Q2.2 Are you a U.S. consumer?

    ○ Yes

    ○ No

---

Q2.3 Have you ever booked a hotel online?

    ○ Yes

    ○ No

---

Q2.4 What was the name/brand of the last hotel you have booked online?

_____

---

Q237 In a few words, what do you look for in a hotel room and bathroom?

_____

_____

_____

_____

_____

---

※

Q2.5 What year were you born in?

_____

Q3.1 Imagine you are planning a trip and you are looking to book the following Upper Midscale Hotel. Please examine the following pictures of the hotel room and bathroom to answer the questions based on your perception.

---

Q3.2

---

X→

Booking _Int The following statement measures your booking intentions of the **hotel room and bathroom** that you see in the images.

| | Extremely unlikely | Moderately unlikely | Slightly unlikely | Neither likely nor unlikely | Slightly likely | Moderately likely | Extremely likely |
|---|---|---|---|---|---|---|---|
| If I were going to reserve a hotel room, the probability of reserving this hotel room is... | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| The probability that I would consider reserving this hotel room is... | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| The likelihood that I would reserve this hotel room is... | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

Fluency The process of thinking about this **hotel room and bathroom design** is:

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | |
|---|---|---|---|---|---|---|---|---|
| Difficult for me | ○ | ○ | ○ | ○ | ○ | ○ | ○ | Comes naturally to me |
| Exhausting for me | ○ | ○ | ○ | ○ | ○ | ○ | ○ | Easy for me |
| I perceive it sluggishly | ○ | ○ | ○ | ○ | ○ | ○ | ○ | I perceive it smoothly |

Pleasure This **hotel room and bathroom design** is:

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | |
|---|---|---|---|---|---|---|---|---|
| Unenjoyable | ○ | ○ | ○ | ○ | ○ | ○ | ○ | Enjoyable |
| Sad | ○ | ○ | ○ | ○ | ○ | ○ | ○ | Cheerful |
| Displeasing | ○ | ○ | ○ | ○ | ○ | ○ | ○ | Pleasing |

Interest This **hotel room and bathroom design** is:

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | |
|---|---|---|---|---|---|---|---|---|
| Uninteresting | ○ | ○ | ○ | ○ | ○ | ○ | ○ | Interesting |
| Boring | ○ | ○ | ○ | ○ | ○ | ○ | ○ | Engaging |

Innov_room The following questions measure your perceptions based on the **hotel room design**.

| | Strongly disagree | Disagree | Somewhat disagree | Neither agree nor disagree | Somewhat agree | Agree | Strongly agree |
|---|---|---|---|---|---|---|---|
| This hotel room design is new | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| The hotel room design is novel and refreshing | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| This hotel room design is unique | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Please select somewhat disagree | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| This hotel design will provide an unusual experience | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| I found going to this hotel room can be a novel experience | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

Innov_bathroom The following questions measure your perceptions based on the **hotel bathroom design**.

| | Strongly disagree | Disagree | Somewhat disagree | Neither agree nor disagree | Somewhat agree | Agree | Strongly agree |
|---|---|---|---|---|---|---|---|
| This hotel bathroom design is new | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| The hotel bathroom design is novel and refreshing | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| This hotel bathroom design is unique | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| This hotel bathroom design will provide an unusual experience | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Please select strongly agree | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| I found going to this hotel bathroom can be a novel experience | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

Typicality_room The following questions measure your perceptions based on the **hotel room design**.

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | |
|---|---|---|---|---|---|---|---|---|
| Very atypical | ○ | ○ | ○ | ○ | ○ | ○ | ○ | Very typical |
| Extremely poor example of a typical hotel room | ○ | ○ | ○ | ○ | ○ | ○ | ○ | Extremely good example of a typical hotel room |
| Very unrepresentative of a typical hotel room | ○ | ○ | ○ | ○ | ○ | ○ | ○ | Very representative of a typical hotel room |

Typicality_bathroom The following questions measure your perceptions based on the **hotel bathroom design.**

| | 1 | 2 | 3 | 4 | 5 | | |
|---|---|---|---|---|---|---|---|
| Very atypical | ○ | ○ | ○ | ○ | ○ | ○ | ○ | Very typical |
| Extremely poor example of a typical hotel bathroom | ○ | ○ | ○ | ○ | ○ | ○ | ○ | Extremely good example of a typical hotel bath room |
| Very unrepresentative of a typical hotel bathroom | ○ | ○ | ○ | ○ | ○ | ○ | ○ | Very representative of a typical hotel bathroom |

**Start of Block: Moderators**

Utilitarian_1 When you travel, how would rate your experience of staying in a hotel?  Staying in a hotel is:

|  | 1 | 2 | 3 | 4 | 5 | 6 | 7 |  |
|---|---|---|---|---|---|---|---|---|
| Unnecessary | ○ | ○ | ○ | ○ | ○ | ○ | ○ | Necessary |
| Ineffective | ○ | ○ | ○ | ○ | ○ | ○ | ○ | Effective |
| Not functional | ○ | ○ | ○ | ○ | ○ | ○ | ○ | Functional |
| Impractical | ○ | ○ | ○ | ○ | ○ | ○ | ○ | Practical |
| Unhelpful | ○ | ○ | ○ | ○ | ○ | ○ | ○ | Helpful |

---

Hedonic_1 When you travel, how would rate your experience of staying in a hotel? Staying in a hotel is:

|  | 1 | 2 | 3 | 4 | 5 | 6 | 7 |  |
|---|---|---|---|---|---|---|---|---|
| Dull | ○ | ○ | ○ | ○ | ○ | ○ | ○ | Exciting |
| Not delightful | ○ | ○ | ○ | ○ | ○ | ○ | ○ | Delightful |
| Not fun | ○ | ○ | ○ | ○ | ○ | ○ | ○ | Fun |
| Not thrilling | ○ | ○ | ○ | ○ | ○ | ○ | ○ | Thrilling |
| Boring | ○ | ○ | ○ | ○ | ○ | ○ | ○ | Interesting |

---

✳

Trips per year How many trips per year do you take?

_____

-----------------------------------------------------------------------------------------

X→

Travel experience Please rate your level of agreement/disagreement with the following statements

|  | Strongly disagree | Disagree | Somewhat disagree | Neither agree nor disagree | Somewhat agree | Agree | Strongly agree |
|---|---|---|---|---|---|---|---|
| I do not travel a lot | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| I do not consider myself as experienced regarding traveling | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Please select strongly disagree | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| For many years, I have been traveling a lot, I have seen many places and consider myself as experienced regarding traveling | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

-----------------------------------------------------------------------------------------

Nights On average how many nights do you spend in the hotel?

○ 1 night

○ 2 nights

○ 3 nights

○ 4 nights

○ 5 nights or more

---

Hotel type freq What type of hotel do you usually frequent?

○ Luxury

○ Upper-upscale

○ Upscale

○ Upper-midscale

○ Midscale

○ Economy

---

X→

Hedonic_2 When you travel, how would rate your experience of staying in a hotel? Please select your level of agreement

| | Strongly disagree | Disagree | Somewhat disagree | Neither agree nor disagree | Somewhat agree | Agree | Strongly agree |
|---|---|---|---|---|---|---|---|
| Staying in a hotel is a source of excitement, fun, and/or enjoyment | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| I get a sense of adventure when I stay in a hotel | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| I enjoy passing the time in a hotel | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| I really get into staying in hotels | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Compared to other things, staying in a hotel is really enjoyable | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

X→

Hedonic_3 Based on this hotel room and bathroom appearance, I have a lot of options to make my trip more....

| | Strongly disagree | Disagree | Somewhat disagree | Neither agree nor disagree | Somewhat agree | Agree | Strongly agree |
|---|---|---|---|---|---|---|---|
| Exciting | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Delightful | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Fun | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Thrilling | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Interesting | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

X→

Utilitarian_2 Based on this hotel room and bathroom appearance, I have a lot of options to make my trip more

| | Strongly disagree | Disagree | Somewhat disagree | Neither agree nor disagree | Somewhat agree | Agree | Strongly agree |
|---|---|---|---|---|---|---|---|
| Necessary | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Effective | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Utilitarian | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Practical | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Helpful | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

Utilitarian_3 When you travel, how would rate your motivation of booking a hotel room and traveling in general?

| | Strongly disagree | Disagree | Somewhat disagree | Neither agree nor disagree | Somewhat agree | Agree | Strongly agree |
|---|---|---|---|---|---|---|---|
| This hotel room and a bathroom accomplishes just what I wanted when staying in a hotel | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| This hotel room and bathroom do not fulfill my needs for staying in a hotel | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Please select strongly agree | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| While looking to book a hotel, this room and bathroom are what i was looking for | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| I am disappointed when I have to search a lot of sites for what I need when looking for a hotel | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

Gender My biological sex assigned at birth:

○ Male

○ Female

○ Other

---

✱

Age What year were you born in?

_____

---

Marital_status Marital Status

○ Married

○ Widowed

○ Divorced

○ Separated

○ Never married

---

Education My Education:

○ Less than high school degree

○ High school graduate (high school diploma or equivalent including GED)

○ Some college but no degree

○ Associate degree in college (2-year)

○ Bachelor's degree in college (4-year)

○ Master's degree

○ Doctoral degree

○ Professional degree (JD, MD)

---------------------------------------------------------------------------------------------------------------------

Income My Income:

○ Less than $10,000

○ $10,000 to $19,999

○ $20,000 to $29,999

○ $30,000 to $39,999

○ $40,000 to $49,999

○ $50,000 to $59,999

○ $60,000 to $69,999

○ $70,000 to $79,999

○ $80,000 to $89,999

○ $90,000 to $99,999

○ $100,000 to $149,999

○ $150,000 or more

Age_sections How old are you?

○ Under 18

○ 18-24 years old

○ 25-34 years old

○ 35-44 years old

○ 45-54 years old

○ 55-64 years old

○ 65+ years old

---

Occupation My Occupation:

○ Management, professional, and related

○ Service

○ Sales and office

○ Farming, fishing, and forestry

○ Construction, extraction, and maintenance

○ Production, transportation, and material moving

○ Government

○ Retired

○ Unemployed

---

Travel_leisure How often do you travel for leisure?

○ Once a week

○ Once a month

○ Once every other month

○ Once every six months

○ Once a year

○ Less than once a year

---

Travel_business How often do you travel for business?

○ Once a week

○ Once a month

○ Once every other month

○ Once every six months

○ Once a year

○ Less than once a year

---

Travel What is your primary purpose of travel in most cases?

○ Business

○ Pleasure

○ Mixed

---

Travel_with Do you usually travel with family or alone?

○ With Family

○ Alone

**End of Block: Demographics**

**Appendix D - Examples of Biophilic Design in the Hotel Lobby**

| Source | Biophilic Design Examples |
|---|---|
| http://ctcdesignstudio.com/portfolio/westin-buffalo/ |  |
| https://www.terrapinbrightgreen.com/blog/2016/03/bill-bd-west/ |  |

| | |
|---|---|
| https://www.brparc.com/2017/11/hospitality-design-trends-2018 |  |
| https://magpie-creative.co/how-hotels-are-integrating-biophilic-design-to-soothe-guests-post-covid/ |  |

# Appendix E – Stimuli Study 3



**Figure 13. Biophilic Lobby**



**Figure 14. Standard Lobby**



**Figure 15. Alternative Focus**

**Appendix F – Survey Study 3**

Q2.1 Are you over 19?

    ○ Yes

    ○ No

*Skip To: End of Survey If Are you over 19? = No*

---

Q2.2 Are you a U.S. consumer?

    ○ Yes

    ○ No

*Skip To: End of Survey If Are you a U.S. consumer? = No*

---

Q2.3 Have you ever booked a hotel online?

    ○ Yes

    ○ No

*Skip To: End of Survey If Have you ever booked a hotel online? = No*

---

Q70 What was the name/brand of the last hotel you have booked online?

_____

---

Q146 In a few words, what do you look for in a hotel lobby?

_____

_____

_____

Q71 What year were you born in?

_____

Q3.1 Imagine you are planning a trip within the USA, and while searching to book a hotel, the following lobby design is presented. Please look carefully at the presented lobby picture as the questions below will be measuring your opinion on this picture.

POM Please rate your level of agreement/disagreement with the following statements in the context of the hotel lobby that you have been presented with.

| | Strongly disagree | Disagree | Somewhat disagree | Neither agree nor disagree | Somewhat agree | Agree | Strongly agree |
|---|---|---|---|---|---|---|---|
| My mind is free and at ease when I picture myself in this hotel lobby | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| I feel content and comfortable with myself when I picture myself in this hotel lobby | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| I experience feelings of peace and stability when I picture myself in this hotel lobby | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Please select strongly agree | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| I have peace and harmony in my mind when I picture myself in this hotel lobby | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

This hotel lobby brings me feelings of peace and comfort

○ ○ ○ ○ ○ ○ ○

X→

WTP Please rate your level of agreement/disagreement with the following statements in the context of the hotel lobby that you have been presented with.

| | Strongly agree | Agree | Somewhat agree | Neither agree nor disagree | Somewhat disagree | Disagree | Strongly disagree |
|---|---|---|---|---|---|---|---|
| I would pay more to stay at the hotel that was shown to me | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Is this the sort of place where you might end up spending more money than you originally set up to spend? | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| I would be willing to pay 0% extra to stay at a hotel that was shown to me | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Please select strongly agree | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| I would be willing to pay 1-5% extra to stay at the hotel that was shown to me | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| I would be willing to pay 6-10% extra to stay at the hotel that was shown to me | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| I would be willing to pay 11-15% extra to stay at the hotel that was shown to me | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| I would be willing to pay 16-20% extra to stay at a hotel that was shown to me | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

Pleasure Looking at this hotel lobby makes me feel:

|  | 1 | 2 | 3 | 4 | 5 | 6 | 7 |  |
|---|---|---|---|---|---|---|---|---|
| Unhappy | ○ | ○ | ○ | ○ | ○ | ○ | ○ | Happy |
| Annoyed | ○ | ○ | ○ | ○ | ○ | ○ | ○ | Pleased |
| Unsatified | ○ | ○ | ○ | ○ | ○ | ○ | ○ | Satisfied |
| Melancholic | ○ | ○ | ○ | ○ | ○ | ○ | ○ | Content |
| Despairing | ○ | ○ | ○ | ○ | ○ | ○ | ○ | Hopeful |
| Bored | ○ | ○ | ○ | ○ | ○ | ○ | ○ | Relaxed |

Arousal Looking at this hotel lobby makes me feel:

|  | 1 | 2 | 3 | 4 | 5 | 6 | 7 |  |
|---|---|---|---|---|---|---|---|---|
| Deperessed | ○ | ○ | ○ | ○ | ○ | ○ | ○ | Cheerful |
| Calm | ○ | ○ | ○ | ○ | ○ | ○ | ○ | Enthusiastic |
| Passive | ○ | ○ | ○ | ○ | ○ | ○ | ○ | Active |
| Indifferent | ○ | ○ | ○ | ○ | ○ | ○ | ○ | Surprised |

Q128 What color is banana, please select blue.

○ Yellow

○ Green

○ Blue

○ Pink

○ Black

---

X→

Manipulation Checks Please rate your level of agreement/disagreement with the following statements in the context of the hotel lobby that you have been presented with.

| | Strongly disagree | Disagree | Somewhat disagree | Neither agree nor disagree | Somewhat agree | Agree | Strongly agree |
|---|---|---|---|---|---|---|---|
| The hotel lobby that I saw in the picture displayed art | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| The hotel lobby that I saw in the picture had an abundance of green plants | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| The hotel lobby that I say in the picture had many empty walls | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

Health Consc Please rate your level of agreement/disagreement with the following statements

| | Strongly disagree | Disagree | Somewhat disagree | Neither agree nor disagree | Somewhat agree | Agree | Strongly agree |
|---|---|---|---|---|---|---|---|
| Living life in the best possible health is very important to me | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| Eating right, exercising, and taking preventive measures will keep me healthy for life | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| My health depends on how well I take care of myself | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| I actively try to prevent disease and illness | ○ | ○ | ○ | ○ | ○ | ○ | ○ |
| I do everything I can to stay healthy | ○ | ○ | ○ | ○ | ○ | ○ | ○ |

Q9.1 My biological sex assigned at birth:

○ Male

○ Female

○ Other

---

*

Q9.2 My Age:

_____

---

Q9.3 Marital Status

○ Married

○ Widowed

○ Divorced

○ Separated

○ Never married

---

Q9.4 My Education:

○ Less than high school degree

○ High school graduate (high school diploma or equivalent including GED)

○ Some college but no degree

○ Associate degree in college (2-year)

○ Bachelor's degree in college (4-year)

○ Master's degree

○ Doctoral degree

○ Professional degree (JD, MD)

-----------------------------------------------------------------------------------------------------

Q9.5 My Income:

○ Less than $10,000

○ $10,000 to $19,999

○ $20,000 to $29,999

○ $30,000 to $39,999

○ $40,000 to $49,999

○ $50,000 to $59,999

○ $60,000 to $69,999

○ $70,000 to $79,999

○ $80,000 to $89,999

○ $90,000 to $99,999

○ $100,000 to $149,999

○ $150,000 or more

---

Q9.6 My Occupation:

○ Management, professional, and related

○ Service

○ Sales and office

○ Farming, fishing, and forestry

○ Construction, extraction, and maintenance

○ Production, transportation, and material moving

○ Government

○ Retired

○ Unemployed

---

Q9.7 How often do you travel for leisure?

○ Once a week

○ Once a month

○ Once every other month

○ Once every six months

○ Once a year

○ Less than once a year

---

Q9.8 How often do you travel for business?

○ Once a week

○ Once a month

○ Once every other month

○ Once every six months

○ Once a year

○ Less than once a year

-----

Q118 What is your primary purpose of travel in most cases?

○ Business

○ Pleaseure

○ Mixed