Human Spaces 2.0: Biophilic Design in Hospitality
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Opening Message from Bill Browning

We all love a hotel room with a view, especially if we can see water. In fact, these hotel rooms tend to be priced significantly more than the same room without a view. This is an obvious example of biophilia – human connection to nature – but there are also other ways that hospitality design can connect with nature and create a better guest experience.

This paper explores the biophilic design strategies used by hotels around the world to enhance guest experiences. It includes an investigation of pricing differentials for rooms with a view to nature and a discussion of the biophilic qualities of different properties and different space types.

Many brands are rediscovering that lobbies can function as more than just transitory space, that they can become spaces that encourage dwell time and increase revenue. This paper also includes the results of an observational study of hotel lobbies with and without biophilic design features. In short, guests like to spend more time in spaces with connections to nature.

Biophilic design is becoming an important topic in hospitality design. We should embrace this design trend; it is good for reducing stress, improving well-being and hopefully, the success of a hotel.

Bill Browning, Founding Partner of Terrapin Bright Green and one of the green building industry’s foremost thinkers and strategists.
Today’s society is more urban, digital and fast-paced than ever before. The downside of this is the overall loss of our connection to nature and the outdoors. As designers, we have a role and an opportunity to positively affect the fundamental ways people interact with space. We can accomplish this by creating hotels that incorporate elements of the natural environment into the overall experience.

Biophilia is the idea that humans possess an innate tendency to seek connections with nature and other forms of life. It stems from the Greek meaning “love of life.”

Biophilic design can be very powerful in the hospitality industry. A cost-effective way to enhance the guest experience, it can bolster feelings of community while improving well-being and health. These principles enable us to not only create a more engaging design experience, but also trigger a deeper affinity to certain brands. The potential is amazing!

For our hospitality clients, we are finding that they want a differentiator in the marketplace and we have been using biophilic principles as a layer to our design foundation.

Over the past year I’ve had the pleasure of collaborating with Bill Browning and his talented team, along with Interface, exploring biophilic principles and the ROI for the guest experience. Come explore our findings.

Lorraine Francis, AIA, LEED AP BD+C is the Regional Director of Hospitality Interiors at Gensler.
According to the Global Wellness Institute, “wellness tourism expenditures are projected to grow to $678.5 billion in 2017, rising from 14% to 16% of the total global tourism market.” These numbers, which include non-spa wellness tourism, suggest a significant opportunity for hotels and resorts to leverage wellness initiatives to gain a competitive advantage.

The value of biophilic design has been well documented by studies showing the physiological and psychological benefits of reconnecting humans with nature. So far, much of this research has focused on the workplace and the value of strategic biophilic interventions in office buildings. However, the implementation and benefits of biophilic design have been much less documented in the hospitality industry.

Cornell University has studied “The Impact of LEED Certification on Hotel Performance”, and found that hotels that achieved LEED certification outperformed their non-certified competitors for at least two years after certification. This differentiation was significant enough that certified hotels had an average daily rate (ADR) that was, on average, $20 higher than their non-certified competitors (Walsman, Verma & Muthulingam, 2014).

In addition, a 2001 study looked at two hotels in Zurich, Switzerland, to estimate the value of a hotel room with a view. One hotel faced either a river or a narrow street, and the other was on a hill outside the city with either a view of a forest or a panoramic view of meadows leading down the city and lake with the Alps in the distance. Using only two hotels, the study showed that both hotels not only charged more for the view, but that many guests showed preference for the river view or lake view and requested those rooms (Lange & Schaeffer, 2001).

To build on these findings, Terrapin, Interface and Gensler collaborated on a series of preliminary studies to help bring clarity to the biophilic design trends in hospitality. The goal is to formulate an approach for further testing and assessing the impact and value of biophilic design elements as well as the unique links to a hotel’s total revenue per available room (TRevPAR) and subsequently RevPAR.

We observed pricing trends for rooms both with and without a view at hotels around the world using Hotels.com, an online booking website. We found that, overall, rooms with a view to nature, particularly to water, are consistently priced higher than rooms without one. For resort hotels there was an 18% difference in the Average Daily Rate (ADR) between a full view to water and other views.

The hospitality industry’s focus has been shifting from the guest room experience to the common, shared or public spaces, whereby the hotel lobby becomes the neighborhood living room. First interactive and engaging “boutique” hotels, and now “lifestyle” hotels, have emerged to provide a creative, innovative and socially connective guest experience. This industry trend is explained by HVS analyst Zeina R. Fawaz in the 2015 article “Lifestyle Hotels: The Emergence of a New Creative Class.” With this trend in mind, we began to ask how biophilic design may be serving as a tool in creating or enhancing the specialized guest experience. We took a look at the types of biophilic experiences hotels are offering. In addition to hotel lobbies, we also looked at hotel restaurants, bars, guest rooms, spas and other amenities to understand which biophilic qualities contributed to the identity of a space and how those qualities might uniquely impact the guest experience and behavior.

Using the “14 Patterns of Biophilic Design” (Browning, Ryan, & Clancy, 2015) as a contextual framework, guest rooms and amenities at 15 hotels around the world were surveyed on site. A more refined online survey was also distributed to our global network of designers and marketing and sustainability professionals to expand the sample set to a combined total of 39 hotels. This report looks at the results of these two surveys and the design trends found among different hotel and resort amenities and what it might mean for the industry as it continues to evolve with guest health and well-being as a primary differentiator both for the guest experience and the brand’s bottom line. The primary takeaway is that a Visual Connection with Nature, Prospect Conditions and a Material Connection with Nature were on average the most frequently or consistently utilized design patterns in all hospitality amenities and hotel rooms.

An additional analysis of a handful of hotels in a shared market in New York City suggests that biophilic experiences can change the use patterns of public hotel spaces. These hotels are also more likely to market themselves — by way of their website — as having a deliberate connection with nature, and how such a connection makes their guest experience unique. This relationship — between design intent and marketing message — reveals yet another opportunity to explore correlations between a hotel’s intuitive or learned awareness of the value of biophilic design and its potential value in brand recognition, enhanced guest experience, or contribution to ancillary revenue streams. These early correlations are intriguing and warrant further research.
We conducted a series of experiments to understand biophilic design trends in hospitality and to assess the impact of biophilic design elements. To evaluate whether a price premium exists for biophilic elements, we looked at room price differences for rooms with biophilic and non-biophilic views. The initial findings show what so many frequent travelers consider fairly obvious: that it is common for hotels to charge a premium for a room with a view to nature. We then surveyed hotels around the world to understand how biophilic design is being implemented in hotel amenities.

To understand if biophilic elements have an impact on how guests use lobbies, we observed guest behavior over a period of time. Finally, we reviewed hotel websites and compared their language to the language used by guest reviews to understand what hotel brands identified as their differentiator(s), and what influenced guest perceptions the most. The results from these discrete studies all support our hypothesis that biophilic design can enhance guest experience and may have the potential to positively impact TRevPAR.

Sample Profile

- **Guest room pricing based on views to nature:** Analysis of 100 hotels around the world
- **Onsite survey of biophilic elements:** Onsite survey of 15 properties on four continents
- **Global snapshot survey of biophilic hotel amenities:**
  - Survey responses covered hotels ranging from small boutique hotels with less than 30 keys to large hotel brands with over 600 keys.
  - Combined survey responses totaled 39 hotels and resorts from 18 countries – Austria, Bhutan, Cambodia, Canada, China, Ecuador, England, Germany, India, Italy, Malaysia, Mexico, Netherlands, Singapore, Sweden, Tanzania, Thailand, and the United States.
  - Largest proportion of surveyed hotels (38%) were in the USA.
- **User trends in biophilic vs. conventional hotel lobbies:** Observed user trends at three different times during the day in the three biophilic and three conventional lobbies in Midtown Manhattan
- **Website description vs. reported guest experience:** Compared language used to describe these same six hotels on their respective websites to the ten most recent TripAdvisor reviews. We then identified parallels and gaps between guest remarks and the hotel’s advertised identity or guest experience.
We chose to use the star rating given by Hotels.com. We felt that this rating, given by the website, would be the most uniform rating system for the entire sample. Some hotels had a separate star rating noted in the hotel description, but many did not. Only hotels with three or more stars were included in this study.

The hotels were also assigned a region: Americas; Europe, Middle East and Africa (EMEA); or Asia Pacific.

Analysis
Using the collected room rates, we calculated the price difference between the full ocean/water view and garden view, and between the full ocean/water view and "other" view for the Resort data set. We then calculated the relative percent difference between these prices for each hotel. Because we did not have a complete data set for room prices for each hotel, we did not have a standard room value, and the relative percent (%) difference takes into account the variability in the data set.

We created pivot tables using the entire data collection sheet to determine relative percent difference between view types for the whole sample. We sorted the data by hotel star rating and included a filter by Region. A second pivot table was then created to review trends in the percent differences between view types. We again sorted the data by star rating and included a filter by Region.

Observations
The results indicated that hotel rooms with a view were priced higher than hotel rooms without a view. The hotel room view descriptions in the Resort sample were more similar than those of the hotels in the Urban sample. For the most part, rooms with a view of the beach were priced higher than rooms with a partial view, or a view of a different amenity, such as a garden or pool. The percent difference was greater for resort hotels than urban hotels.
Research Methods and Results

Resort

The Resort hotel sample featured 50 hotels from around the world and slightly favored the Americas region. Overall, water views commanded a higher price than any other kind of view, averaging $436.49/night during peak season. On average, the price difference between rooms with a full view to water and rooms with a garden view ($388.67/night) was 18.00% higher, and between rooms within the "other" view category ($340.53/night) was 18.28%.

The "other" view category included a variety of alternative view types, such as courtyard, city, town, jungle, mountain, and pool. The variability of view types made it hard to aggregate and compare across the whole sample. Additionally, many resorts did not advertise rooms with differing views, and it was impossible to know if all rooms had a view or if none did.

Urban

The Urban sample also contained 50 hotels and drew more evenly from across the globe. Overall, the comparison to rooms with a city view revealed that rooms with a view to water (e.g. ocean, lake, river) had an 11.17% premium, those to a famous landmark had an 11.80% premium, and those with views to a park/garden commanded a premium of only 1.25%.

The analysis showed that urban hotels had a higher average pricing for rooms with views to a famous landmark ($351.15/night). On average, rooms with a view to a park/garden or water were fairly similar at $325.59 and $332.29/night, respectively. The average cost per night of a room with a city view was notably lower at $296.86/night.

Similar to the Resort hotels, the variability in views could be significant. The very small price difference between city view and park view may have been caused by the variability in how the hotels defined park and garden. For example, hotels in New York City overlooking Central Park have a different experience than a hotel in Marrakesh overlooking the property's garden. The definition of park, and its pricing, can change drastically from one location to another.

There is also a value associated with famous landmarks in urban settings that visitors value. Times Square in New York City, the Eiffel Tower in Paris, and Big Ben in London are valuable views as cultural icons. They can, however, also be associated with views of water. For example, the Statue of Liberty is in New York City’s harbor, and Tower Bridge in London crosses the Thames, meaning that views to some famous landmarks also have views to water. No adjustment was made in the data to account for these views, and the prices reflected the description given on Hotels.com.

Another factor that influenced hotel pricing was room height (i.e. floor number). While this was a common point of differentiation for urban hotels, room values associated with height were not included in this study. See the Appendix for limiting factors of the study.
Bill Browning: The Value of Views

From a purely rational basis, a good room should be the same price regardless of the view. However, we know from the Hotels.com study that hoteliers charge up to an 18% premium for rooms with a view to water. With such direct evidence that views to nature are regarded as important and valuable, biophilic views should be a qualifying factor in the siting, orientation, and design of any hotel. When existing conditions do not support a quality view to nature, there is relative justification in specifying design strategies, such as natural analogues (e.g. finishes, textiles, hardware, artwork) to help enhance the biophilic experience of the guest room.

Onsite & Global Snapshot Surveys

Two surveys were conducted, one onsite by the lead investigators and one by members of our global network. In total, 39 hotels were reviewed globally. The survey results represent 20 hotels in the Americas, 10 in Asia, and nine in Europe, Middle East and Africa (EMEA).

Onsite Survey Method

Based on the finding that hotels value views to nature, we began to ask how else biophilic design was being used in not just hotel rooms, but in all hotel amenities. To review biophilic design in hotel amenities, we developed a survey framework based on the "14 Patterns of Biophilic Design: Improving Health and Well-being in the Built Environment" (Browning, Ryan, Clancy, 2014). To start, we conducted 15 onsite surveys of hotels across four continents. These surveys reviewed the use of the 14 patterns in each of the amenities, rating each pattern as "absent," "partial presence," or "strong presence." The survey also included notes on each amenity and the overall experience of the space.

Of the 15 properties in the onsite sample, nine were considered "Urban hotels," located within a city. The remaining six hotels were "Resort hotels" that were located outside of any urban centers. These resort hotels were generally associated with a natural feature or region, such as a beach, as opposed to a city. The hotels ranged in size from chains with over 600 keys to small boutique hotels with less than 30 keys.

The onsite survey revealed that hotels were using biophilic design across many amenities. The survey also showed that while Visual Connection to Nature, or views to nature, was one of the more widely used patterns, it was far from the only pattern used. Even in spaces with no views to nature, hotels were still creating a biophilic experience.

Global Snapshot Survey Method

To get a larger sample size and variety of hotels, we then developed a more concise global snapshot survey using the same criteria as the in-depth survey. The global snapshot survey was designed to capture data regarding trends in pattern usage in hotel design around the world. It did not collect qualitative descriptions of each amenity as was done for the onsite survey, but rather captured a snapshot of biophilic design in each hotel.

Analyses:

The survey findings were analyzed by amenity and showed significant design trends across the sample. The flexible lobby lounge/bar at citizenM Times Square blurs the boundaries between indoors and outdoors in a spacious volume of complexity and order, mystery, comfort, and delight. The Parkroyal on Pickering in Singapore combines biomorphic forms, natural materials, water, and other design patterns for the ultimate biophilic lobby-bar and pool-bar experiences. The Faena in Miami, Florida, delivers the ocean to the guest rooms with a perfect color pairing of textiles and ceramic tiles. Infinity pools excite and indulge, while hotels from The Nines in downtown Portland, Oregon, to the jungle retreat of Malihom Estate in Penang, Malaysia, and Uma Paro in mountainous Bhutan each provide guests with an impressive balance of prospect and refuge.

As we assessed what biophilic design qualities each amenity was doing well (i.e. exhibits a "strong presence") of, survey results began to beg the question: Are other amenities missing out on optimizing the guest experience?

In a competitive market, hotels and brands are continuously looking for ways to differentiate their guest experience. Brands that embrace nature as a differentiator are likely to establish a visual connection right away, signifying a potential association with the guest experience.

As Figure 1 indicates, however, there are differences in survey respondents' perception of the strength of the nature connection. Perhaps more important is understanding why guests might benefit from a strong presence of any one pattern in particular.
Research Methods and Results

For instance, the use of a visual connection with nature is relatively consistent across hotel amenities. In the surveys, visual connection routinely ranked among the most impactful biophilic design characteristics of each amenity. But the perceived strength of the visual connection is far greater among guest rooms and spas than it is for lobbies and restaurants. It is unclear whether this is a result of leveraging the presence of "free" nature – primarily in the form of quality views to vegetation – or whether hoteliers and designers have made deliberate efforts to enhance the experience of guest rooms and spa facilities with a "strong presence" of that visual connection. A similar question may be asked regarding the prevalence of either Non-Visual Connection with Nature or Refuge in spas compared with lobbies or other amenities.

Research shows that visual connections with nature have resulted in lowered blood pressure and heart rate, improved cognitive performance, and positive attitudes. Given the breadth of research in this particular aspect of biophilia (see Browning, Ryan, Clancy, 2014, p.24), as well as the role of a lobby as a buffer from urban overstimulation, travel, and other stressful circumstances, one might expect the surveys to reflect a higher overall perceived connection with nature within hotel lobbies. One possible explanation is that most conventional urban hotels are too limited in space, location, or budget to support such a strong visual connection with nature. The other possibility is that the potential positive impact to guest (and employee) health and well-being is not widely shared within the hospitality industry.

The same can be said of the relatively low prevalence of refuge spaces in restaurants and bars, natural materials in guest rooms and spas, or the underutilization of and unique opportunity for multisensory guest experiences in all amenities. Ultimately, the survey findings suggest that while some hotels and resorts do a great job at capturing the essence of the biophilic guest experience, most are not optimizing their opportunities.

This translates into action in a number of ways. For any hospitality project, pairing a desired health and wellness outcome with each design decision will be just as important as retaining aesthetics. Leveraging existing or "free" biophilic features is a great place to start. Opportunities for new design projects will differ from operational strategies, but facilities management is usually responsible for upkeep, so collaboration between disciplines will be paramount to moving beyond surface interventions to creating a unique and holistic biophilic guest experience.

Bill Browning: Multisensory Experience

In office buildings, the emphasis of biophilic design tends toward visual interventions. This is not entirely surprising as the majority of the brain's sensory process mechanisms are focused on vision. However, experiences are more intense and more memorable when multiple senses are engaged simultaneously. Hospitality is one of the few places where designers tend to pay attention to the other senses. The hand of the fabrics; the scents of flowers, candles and food; crackling of logs in a fireplace; the splash of water in a fountain; the texture of wood grain and stone in furnishings; and bird song in a lobby or on a patio are ways of creating more memorable spaces.

Some brands have created signature scents that are used in candles and toiletries. For Westin, their signature scent is called White Tea, and guests can purchase bath and fragrance products through the hotels and their website. The Rosewood Inn of the Anasazi in Santa Fe worked with a small local company to produce toiletries using local cedar and Native American medicinal plants.
Research Methods and Results

Lobby User Trends Review

To further understand how guests respond to biophilia in hotels, we looked at user trends in the hotel lobbies of six Midtown Manhattan hotels. Midtown contains many of New York City’s most popular tourist destinations, including Times Square, Central Park, and the theater district. This robust tourist hub has a high density of hotels, which provided a good selection of both biophilic and conventional hotels. Biophilic lobbies were selected using the same criteria from the surveys, based on the 14 Patterns of Biophilic Design. Biophilic design patterns that are strongly represented in these spaces are engaging, easy to see, touch, hear and experience, and could be a defining aspect of the space.

The three biophilic hotels selected were similar in size, price range, and location. For each biophilic hotel, a conventional hotel of similar size, price range, and location was selected.

Bill Browning: Lobbies & Guest Rooms – citizenM Times Square, United States

With micro-rooms and a market for millennials on business travel, the citizenM brand has focused on making the lobby a large comfortable gathering space, said Edwin Hendriksen, former Senior VP of Development and Investments, North America, for citizenM hotels. The brand has focused on creating social spaces, as they feel that their target market is less interested in spending time in their rooms and more interested in interaction. The lobby of the Times Square, Manhattan hotel includes a library, full-service bar, self-serve dining area, and a variety of indoor, outdoor, and mezzanine seating areas. Green walls and trees in the rear courtyard are visible throughout the lobby. This approach supports citizenM’s goal of creating a convivial space. Throughout the day, the lobby is popular with both hotel guests and local visitors who come to meet and get a coffee or cocktail at the bar, all of which increase revenue without having to fill additional beds.
User Trend Analysis
Each of the six hotels' lobbies was visited once in the morning (8:00am-10:30am), once in the afternoon (12:00pm-2:30pm) and once in the evening (5:00pm-8:00pm) during the workweek. Each visit was exactly 45 minutes long. During each visit, all non-employees in the space at the start of the visit and all non-employees who entered the space during the visit were counted. Each occupant was recorded as a passive user, an active user, or transient user. A passive user was defined as engaging in an individual activity, such as using a computer or eating alone. An active user was defined as engaging in a social activity, such as participating in conversation, eating in a group, or having a meeting. Transience was defined by activities passing through the space, including checking in or out and walking through to the exit or elevators. Individuals who entered the space more than once during the 45 minutes were only counted one time. Individuals who switched between active and passive uses during the 45 minutes were counted based on the first use observed. Percentages of use types were compared for different times of day and averaged to reflect overall use patterns.

Observed User Trends
On-site observations showed that guests in the lobbies of the biophilic hotels were slightly more likely to be observed engaging in either an active or passive use of the lobby than guests in the lobbies of the conventional hotels. In biophilic hotel lobbies, 36% of occupants were observed as actively or passively using the space, as compared to 25% of occupants in the conventional hotel lobbies. There was essentially no difference between biophilic and conventional hotels in regards to use type.

Of occupants who were observed using the biophilic hotel lobbies, 71% were engaged in an active use as compared to 70% active use in the conventional hotel lobbies. There was a general trend among both biophilic and conventional hotels of a higher percentage of users engaging in active rather than passive activities in the evening. While mornings had the highest rates of transience in the conventional hotel lobbies, mornings had the lowest rates of transience in the lobbies of the biophilic hotels. This trend was largely due to the popularity of the biophilic hotels’ lobbies during the morning hours.

These insights are important as more and more brands are rethinking their lobbies to potentially evolve the guest experience and encourage spending.

Online Marketing and Guest Review Comparison

Methodology
An off-site analysis was conducted for each of the six hotels to determine how each hotel represents itself in advertising and how each hotel is portrayed by customers in reviews. We examined the homepage of each hotel and the larger brand or hotel chain associated with it. Fifteen short descriptive phrases were extracted from the text on each hotel’s homepage and brand homepage. The ten most recent customer reviews posted on each hotel’s TripAdvisor page at the time of the analysis were also examined. Between one and three short descriptive phrases were extracted from each review, depending on the length of the review.

Ten content types were defined based on the content observed in the advertising and reviews: Amenities, Clientele, Design and Décor, Ecological or Social Ideals, Experience, Location, Maintenance and Service, Spaciousness, and Views. In addition, we recorded all references to biophilic design patterns and nature. We calculated the percentage of phrases that refer to each content type, as well as to a biophilic design pattern and nature. Only positive phrases from customer reviews were included in this analysis.
Content Comparison

Content type in advertising was similar between the biophilic and conventional hotels overall. The most common content type in selected phrases from both the biophilic and conventional hotels’ online advertising was design and décor. The second most common content type was experience, which included phrases such as “*a genuine Manhattan immersion,*” and “*Privacy in the most public place in the world.*” While the websites of both hotel types discuss experience the same amount, guest reviews of biophilic hotels mention experience twice as often as reviews of conventional hotels.

The third most commonly mentioned content type differed for the biophilic and conventional hotels. The biophilic hotels talked about ecological and social ideals in phrases such as “commit to safeguarding [nature],” “affordable luxury for the people,” and “corporate equality,” a content type not mentioned at all on the conventional hotel homepages. The conventional hotels, on the other hand, had a heavier focus on location and convenience. This content type, while still mentioned on the biophilic hotels’ homepages, was less prevalent. The conventional hotels also had significantly more mentions of maintenance and service on their homepages in phrases such as “treats the guest as family,” “blends Asian hospitality with Western comfort,” and “warm Irish hospitality.”

The most common content type in the positive TripAdvisor reviews of biophilic hotels that were examined for this study was design and décor, matching the most common content type in advertising. The second most common content type, however, differed from the advertising focus. Rather than focusing on experience, the customer reviews focused equally on views and on maintenance and service. The experience was still important to reviewers as the third most common content type. Ecological and social ideals were a less prevalent content type but were mentioned a few times in reviews of one of the biophilic hotels.

Reviews of conventional hotels were less well-matched with their advertising. While the most common content type in advertising was design and décor, this content type was only the third most common content type in the phrases from positive customer reviews. The most common content type in positive reviews of the conventional hotels was maintenance and service, mentioned in phrases such as “clean, comfortable and with friendly service” “real enthusiasm and a sense that they really care” and “staff seemed like they could not do enough for you!” The second most common content type was location, which was positively referenced in phrases such as “Hotel is in an ideal place,” “perfect location not too close to the craziness” and “so close to everything we needed.”

**Maintenance and service were mentioned most in guest reviews of conventional hotels, while in biophilic hotels, nature and design of the space took precedence.**
Biophilic design patterns were also more likely to be referenced in reviews of the biophilic hotels in the study than in the conventional hotels. Prospect was, by far, the most commonly mentioned biophilic design pattern in all the reviews studied. In addition to having more references to biophilic patterns generally, positive reviews of the biophilic hotels also referenced a wider range of biophilic patterns. A customer at Biophilic Hotel 1 described it as having "smells of wood and nature," referencing a non-visual connection to nature. A Biophilic Hotel 2 review described a "mood pad which controls the lights (mood lighting)" as a positive feature of the room, a subtle reference to dynamic and diffuse light. All three biophilic hotels had mentions of a visual connection with nature. A review of Biophilic Hotel 1 mentioned the "living wall in the dining area," the rooftop bar at Biophilic Hotel 2 was described as "perfect to sip on a cocktail and watch the sun," and a review of Biophilic Hotel 3 spoke highly of the "spectacular view of the River." The only biophilic design patterns referred to in reviews of the conventional hotels were Prospect and Refuge.

Using TripAdvisor, the observation of design patterns can vary greatly from person to person. Indeed, a space seen by the same person at different times of day or in different contexts may be interpreted differently. This analysis provides a wider perspective on the use of biophilic design patterns in the hotels in the study than an individual analysis alone could provide. While the sample size was too small to draw any statistically significant conclusions, it suggests a relationship between biophilic design and user trends.
According to the Deloitte report, "Winning the race for guest loyalty" (Jennings et al., 2014), one of the most important strategies to generate loyalty in repeat guests is to create a customized experience. Customers have come to expect the basics like cleanliness and comfort, and these qualities are no longer enough to differentiate from competitors. Millennials in particular, who will make up three-quarters of the workforce and frequent business travelers by 2025, are looking for a more memorable experience.

The findings from the online content comparison from the conventional hotels in Manhattan show that guests most often mentioned maintenance and service. This suggests that while guests were pleased with the experience they had, it did not exceed their expectations. While the biophilic hotel reviews also referenced the maintenance of the hotel, they referenced nature and the design of the space more. The emphasis on the design is a differentiating factor between the biophilic hotels and conventional ones, suggesting that guests had an experience that went above and beyond their expectations of a clean room and comfortable bed.

In some cases, biophilic interventions also offer opportunities to create personalized guest experiences. If a hotel has a variety of view types, including nature views and less desirable views, ensuring that guests who belong to the hotel's loyalty program check into a room with a view can deepen that guest's loyalty to your hotel. In the online content analysis for citizenM in New York, one guest referenced the adjustable lighting in the room. This adjustable lighting is another opportunity to create a personalized guest experience for loyalty program members by ensuring that their room's lighting is set to their preferred setting upon arrival.

For guests who are not a part of a hotel's loyalty program, creating a customized experience is much more difficult. For these guests, the application of biophilic design can help create a memorable experience that leads to repeat customers. Not only can biophilic design create a unique experience that makes guests want to stay with you again and again, but it can also support the health and well-being of travelers. Travel can lead to stress—whether it's dealing with airport security, a delayed flight, or traveling with kids. Certain biophilic patterns have been shown to decrease stress and improve mood.

Bill Browning: Branding & Price Points – PARKROYAL on Pickering, Southeast Asia

With more than 2.7 times its footprint in lush planted green areas, extensive water features, and amazing biomorphic forms, the local cab drivers refer to the PARKROYAL on Pickering as the 'jungle hotel.' According to the architect Richard Hassel of WOHA, as the hotel was about to open, the ownership realized that the experience would be substantially different than the other hotels in the PARKROYAL Hotels & Resorts brand. It was too late to completely rebrand the property, so it was instead renamed a “PARKROYAL Collection Hotel.”

Bookings have been better than original projections, and the operators have increased the average rack rate for the hotel.
Looking Ahead

The value of conducting a series of smaller studies was to get a broad perspective on how the guest experience might be defined in terms of biophilic design and in the context of hospitality. Given that the guest experience is overwhelmingly a main driver of design choices in the hospitality industry, we would like to better understand the relationship of urban hotels to their local environment to determine what opportunities hotels can potentially use to facilitate an enhanced guest experience and ideally improve the value of the hotel lobby as both a revenue stream and a neighborhood asset.

Analysis of Industry Trends

Key Messages

1. 36% more guests spent time in biophilic hotel lobbies than in conventional lobbies
2. Biophilic hotel design and décor is a strong factor in creating a unique and memorable guest experience
3. While the websites of both hotel types discuss “experience” the same amount, guest reviews of biophilic hotels mention “experience” twice as often as reviews of conventional hotels
4. Hotel guest rooms with a view to water are priced on average 11%-18% higher than rooms without a view
5. Price premiums can be up to 12% for hotel guest rooms with views to famous landmarks or nature compared to rooms without a view
Global Snapshot Survey Method – Detailed description
To get a larger sample size and variety of hotel, we then developed a more concise global snapshot survey using the same criteria based on the 14 patterns of biophilic design as the in-depth survey. The global snapshot survey included the lobby, two responses for restaurants and bars, the spa, and the guest room. For consistency in assessment of biophilic amenities, respondents rated each of the patterns using the same “absent,” “partial presence,” or “strong presence” approach as used in the onsite survey. Respondents were not required to review every amenity in the hotel, only those that they visited. The survey also asked respondents to identify the three patterns that had the strongest presence in each respective amenity and which of the senses were primarily affected. The survey asked additional yes/no questions about references to nature in the furniture, decor, and architecture. For each amenity, respondents were also asked to identify the pattern that had the greatest impact on the space, noting that it could be a pattern that had only “partial presence,” but was perceived to be uniquely impactful. The global snapshot survey was designed to capture data regarding trends in pattern usage in hotel design around the world. It did not collect qualitative descriptions of each amenity as was done for the onsite survey, but rather captured a snapshot of biophilic design in each hotel.

The global snapshot survey was accompanied by a reference guide that defined each of the 14 patterns to give all survey respondents the same baseline background knowledge. It was then circulated within our networks to gather responses from around the world. By using the same rating system in both the onsite survey and global snapshot survey, the data from both could be aggregated. Between the two survey efforts, 39 hotels were reviewed globally. The survey results represent 20 hotels in the Americas, 9 in EMEA, and 10 in Asia.

Hotels.com Analysis – Limitations of study
The study was limited by the information provided by Hotels.com. The view descriptions are not standardized, which creates variability in how different hotels use the same view type. This variability can affect pricing and guest expectation when booking a room. The hotels’ distribution was also affected by the locations populated by Hotels.com. The study also focused on vacationers traveling on the weekends and does not look at weekday hotel prices for work travel.

The average room rates are unweighted averages of all rooms with that view type. However, not every hotel has every view type. The % difference calculations between view types was calculated from a subset of the data which includes only hotels that have both room rates represented. We used the percentage difference formula to compare the room prices against one another.

Hotels.com does not show occupancy rates. Therefore, this study could only assess the price at which rooms were listed, not how frequently people choose a room with a view. While a higher rate is beneficial to the hotel, higher rates do not necessarily reflect how the room impacts the guest experience. Further research is required to determine if the nature view increases F&B sales, increases customer loyalty and return trips, or increases a guest’s likelihood to recommend the hotel to others, either by word of mouth or online review.

These preliminary results support our hypothesis that rooms with a view to nature, in particular to water, are consistently priced higher than rooms without.
Appendix

References and Bibliography


Health impacts

- Stress
  - Lowered blood pressure and heart rate

- Cognitive Performance
  - Improved mental engagement and attentiveness

- Emotion, Mood & Preference
  - Positively impacted attitude and overall happiness

New York City, NY, USA. The built-in wall shelving matrix featuring books, photos, natural artifacts, and plants extends from the street, through the interior lobby, and into the back courtyard, blurring the boundaries between indoors and outdoors. Seating options from multiple vantage points—lobby lounge, bar, outdoor courtyard, and mezzanine—provide views to birds, trees, vines, and potted plants, some of which are real and others artificial. Guests spend hours sipping a beverage and enjoying the vibrant space as a place to work, socialize, or chill.

Material connection with nature

References to nature

- Furniture, finish materials (wood, stone, leather)
- Textiles and textures (wool, woven materials; malakable vs rigid, soft vs hard)
- Carpet patterns, motifs, colors, tones

Health impacts

- Stress
  - Unknown

- Cognitive Performance
  - Decreased diastolic blood pressure; Improved creative performance

- Emotion, Mood & Preference
  - Improved comfort; Observed view preference

Penang, Malaysia. The whole of the lobby uses a natural color palette with natural materials, including wood furniture and stone flooring. One seating area against the main flow of foot traffic, has a carpet with abstract nature references. Ornamental animal figurines line the wall, which is finished with a striated stone and wood panel detail. The characteristics of this seating area are more welcoming than the centrally located.

BIOPHILIC Lobbies in practice

Direct and abstract references to nature

- Select nature-inspired carpet patterns, colors, and textures.
- Display animal figurines, flora-fauna motifs, murals, mosaics, and artworks.
- Blur indoor-outdoor transitions by blending representative nature into real, living nature.
- Leverage regional qualities and characteristics to reinforce a connection with nature, either as direct or abstract references.

BIOPHILIC DESIGN IN HOSPITALITY

Biophilic Hotel Lobbies

ROLE OF BIOPHILIA IN LOBBIES

A hotel lobby sets the stage for the guest experience. It's a first impression of the guest experience being offered. Hotels seeking to support a feeling of escape, comfort, or socialization will intuitively or intentionally use biophilic design to engender such experiences. Research in neuroscience and environmental psychology tells us that a biophilic approach to design can effectively reduce stress, among other health benefits, when thoughtfully implemented.

INDUSTRY TRENDS

In a competitive market, hotels and brands are continuously figuring out ways to differentiate the guest experience. Because the future traveler is more educated and more global, awareness of personal wellbeing is paramount to their travel experiences. The work hard, play hard ethic generates a need and expectation to reinforce a connection with nature, to strengthen a personal wellbeing mindset.

BIOPHILIC NAVIGATION

Prospect

View depth and content

Lobbies with strong prospect to focal points and amenities are able to orient, improve comfort, and inform decision-making among guests and employees. They also tend to include one or more of the following elements:

- Rill, fountain, pool, natural water body
- Comfortable seating area that suggests greater privacy or restoration
- Bar, restaurant, lounges, other social space
- Courtyard, landscape, cityscape

Material connection with nature

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BIOPHILIC DESIGN IN HOSPITALITY

ROLE OF BIOPHILIA

Hotels seeking to support a feeling of escape, comfort, or a connection to the local culture and ecosystem will intuitively or intentionally use biophilic design to engender such experiences; this is particularly true of contemporary hotels where the guest room is often designed to support multiple functions beyond sleep, including in-room business, relaxation and restoration, dining, and entertainment. In this type of guest room, outdoor views and quality lighting conditions play an important role in establishing a biophilic experience that is likely to have a meaningful impact on the health and wellbeing of the guest.

Guest rooms in “festival” hotels tend to be smaller, functioning solely as a comfortable place to sleep. With fewer in-room amenities, the hotels focus more on the shared/public spaces. In this case, the primary role of biophilia in the guest room is to support restoration while directly or subtly reinforcing a connection to place. Research in neuroscience and environmental psychology tells us that a biophilic approach to design can effectively reduce stress and induce restoration or curiosity when thoughtfully implemented.

INDUSTRY TRENDS

Early studies tell us that hotels and resorts price rooms with a view to water up to 12% higher. Views to outdoor vegetation, oceans, and landscapes are essentially free biophilia, so it is no surprise then to find that a Visual Connection with Nature is the most well-represented biophilic design pattern in hotel guest rooms, but not all guest rooms are so fortunately oriented.

Early studies on industry trends reveal that several additional biophilic design patterns are used frequently in guest room design. Material Connection with Nature is a particularly frequent and well-represented biophilic design pattern in hotels and resort guest rooms around the world. Dynamic & Diffuse Light and Refuge are also trending but heavily underutilized patterns in their potential to contribute to the biophilic experience of guest rooms. Some hotel brands are using these biophilic design patterns to help address common design problems, such as creating a uniquely restorative environment with quality daylight and a limited budget.

Working with budget constraints. While passive incorporation of biophilia by way of views to the ocean or landscape is perhaps the most cost-effective strategy, not all guest rooms are so fortunately oriented. Some city views can be just as intriguing or captivating, and may garner just as much attention. Hotels with limited quality views to nature have spent more money on biophilic strategies in their guest rooms, often with a focus on creating a similar biophilic experience at a lower investment cost. An architectural solution may include the bed recessed into the wall, or an alcove bedroom area. In each of these solutions, the bed occupies a uniquely protected space within the larger guest room, characterized by a lower ceiling plane and protection to the back, either from a wall or headboard.

Diversifying benefits of smart lighting solutions. Circadian lighting systems are a hot topic in healthy lighting design. While the technology is still a relatively novel and costly investment, the most effective health strategies is to provide ample access to quality views.

The right type of light is also important, especially for guests who are traveling from different time zones – access to appropriate daylighting and supplemental electric lighting schemes at the right times of the day supports the need for guests to reset their biological clock. Some hotels have lighting presets for mornings and evenings, making it convenient for guests to configure – so long as the controls are placed at intuitive locations within each room.

Daylight penetration into the bedroom and even the bath has emerged as a major concern giving rise to a significant shift in design solutions. Hotel brands, such as AC Hotels and the Parkroyal on Pickering in Singapore, that opt not to have a wall between bath and bedroom, using instead the vanity as an open divider, tend to have substantial daylight penetration with the added benefit of lower electricity use. The water closet alone is then enclosed in a smaller room, often with a frosted glass partition and some daylight penetration. This is sometimes a preferred strategy for hotels with smaller guest rooms. The primary benefit of these strategies is evening and right-time wayfinding, which can help limit the need to turn on disruptive electric lights that can further disrupt sleep patterns.

HEALTH IMPACTS

Today’s work hard, play hard ethos generates a need and expectation to rejuvenate well.

Material connection with nature & biomorphic forms

Direct and abstract references to nature

- Textiles: duvet covers, tapestries, furniture patterns, which have been shown to reduce stress
- Artwork: paintings, prints, sculpture, installations
- Light: stands, sconces, pendants, chandeliers
- Hardware: knobs, handles
- Materials: floors, sink, carpet, headboard
- Wall cover: wallpaper or decal patterns

Refuge

Singapore. Daylight pours in with only floor finishes to differentiate between bedroom and bath, while the water closet and shower are enclosed in clear glass, allowing complete daylight penetration and views to vegetation and sky. Two layers of mechanical blinds are provided for varying degrees of daylight penetration and visual privacy. Minimal electric lights are needed to supplement the guest experience.

Adaptable strategies supporting restoration

- Moderate refuge:
  - Window seat
  - Bed facing a window
  - Canopy bed
  - Soffit over bed headboard (12-18 inches lower than the ceiling)

- Strong refuge:
  - Alcove
  - Bed and headboard with partial/optional enclosure

- Maximum refuge:
  - Bed and headboard

BIOPHILIC GUEST ROOMS IN PRACTICE

Dynamic & diffused light

Integrative strategies supporting restoration

- Interior window, or low/no wall between bath and bed
- Glass partitions for water closet and shower
- Optimize sky views
- Lighting presets and controls
- Minimize nighttime exterior electric light intrusion

Health impacts

- Stress
- Positive impacted circadian system functioning; increased visual comfort
- Cognitive Performance; Emotion, Mood & Preference
- Unknown

Cognitive & Preference

Emotion, Mood & Preference

Improved comfort

Stress

Decreased diastolic blood pressure; improved physical performance

Stress

Reduced stress

Cognitive Performance; Emotion, Mood & Preference

Improved concentration, attention and perception of safety

Emotion, Mood & Preference

Unknown

Phuket, Thailand. Teak floors and paneling are an obvious choice for a Thai resort, but this application is so effective because there are multiple levels of information – solid floors ground the guest to the place, textured track doors encourage a tactile experience, and window screens visually connect the guest to the surrounding environment.

Research tells us that refuge conditions support restoration and that guests locate the right times of the day. Hotels design strategies for hotel guest rooms can offer a unique restorative experience – one that supports feelings of safety, comfort, and mind-body recharge without compromising brand quality.
HEALTH IMPACTS

Studies have shown that olfactory exposure to herbs and tree oils have a positive effect on the healing process (e.g., Li et al., 2012; Kim et al., 2009), and according to Charles Spence (2012) at the University of Oxford, research also suggests audition plays an important role in eating behaviors and flavor perception. So, if the intent is to connect the guest to a specific culture or place through cuisine, a venue’s smells, background noise and food preparation sounds may each have a profound impact in enhancing the guest experience.

For hospitality ventures looking to further accentuate their health and wellness programming, the auditory experience goes beyond pleasant sounds of expensive coffee grinders, the sizzling of steaks, and culturally relevant music. Consider that exposure to nature sounds can accelerate psychophysiological restoration up to 37% faster than potentially stressful urban sounds (Alvarsson et al., 2010), and that while seeing real nature can have a positive impact on both perceived and real physiological stress reduction (Kahn et al., 2008), the simultaneous auditory perception of nature sounds further improves perceptions of what is being viewed (Hunter et al., 2010).

As we consider how these various “natural resources” can be leveraged to enhance the culinary experience, we begin to see that the multisensory F&B experience is potentially the richest and most complex of guest experiences, and consequently the greatest opportunity to differentiate a venue from competitors.

Prospect & Refuge

References to nature

<table>
<thead>
<tr>
<th>Multisensory experiences</th>
<th>Health impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Auditory broadcasting of nature sounds relevant to the food or place (e.g., the sound of lapping ocean waves while eating oysters)</td>
<td>Stress Reduced systolic blood pressure and stress hormones</td>
</tr>
<tr>
<td>• Playful and complex flavors and smells</td>
<td>Cognitive Performance Positively impacted cognitive performance</td>
</tr>
<tr>
<td>• Cracking fires providing visual (and sometimes) auditory stimuli as well as thermal variability</td>
<td></td>
</tr>
<tr>
<td>• Nature-inspired food presentation and composition and serving dishes</td>
<td></td>
</tr>
<tr>
<td>• Variety of tactile connections with nature</td>
<td></td>
</tr>
</tbody>
</table>

Non-visual connection with nature

References to nature

<table>
<thead>
<tr>
<th>Natural analogues</th>
<th>Health impacts</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Natural materials familiar to the region</td>
<td>Stress Positively impacted perceptual and physiological stress responses</td>
</tr>
<tr>
<td>• Repeating and hierarchical patterns</td>
<td>Cognitive Performance Decreased diastolic blood pressure</td>
</tr>
<tr>
<td>• Organic forms in decor and furniture</td>
<td>Improved cognitive performance</td>
</tr>
<tr>
<td>• Complex yet orderly layers of materials, light, and visual information</td>
<td></td>
</tr>
<tr>
<td>• Variety of grab-and-go dishes that support gustatory exploration</td>
<td></td>
</tr>
</tbody>
</table>

Kuala Lumpur, Malaysia. Each of the hotel’s several F&B venues offers a variety of visual and tactile complexity in order to enrich the dining and bar experience. Mosaic buffet restaurant is a maze of tidy grab-and-go dishes that repeatedly pique the guest’s curiosity before sitting down in plush a booth or scalloped sofa chairs with a view to the park.
Health impacts

Unknown

Biophilic design response may not be to have more water, but to have more opportunities for guests to experience water – to see, as well as to hear, touch, and taste it.

Optimizing the multisensory experience. Of the hotel spa and wellness venues surveyed, 59% were identified as having some degree of a non-visual connection with nature, with only 33% rated as having a “strong presence” of non-visual biophilic qualities. For venues looking to further distinguish themselves from competition, the sensory experience goes beyond pleasant sounds of trickling water and soothing music. Other sensory exposure to herbs and tree oils have a positive effect on the healing process (e.g., Li et al., 2019). Shales have also shown that exposure to nature sounds can accelerate psychophysiological restoration up to 22% faster than potentially stressful urban sounds (Alverson et al., 2010); and that while seeing real nature can have a positive impact on both perceived and real physiological stress reduction (Kahn et al., 2010), the simultaneous auditory experience of nature sounds further impacts perceptions of what is being viewed (Hunter et al., 2010).

The strategic pairing of nature-based sensory experiences has the great potential to heal and restore. Spas that effectively support combinations of sounds and smells to define different spaces and desired guest responses are more likely to create a unique and memorable guest experience.


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