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RESEARCH

HOSPITALITY DESIGN AND WELL-BEING

QUALITY SLEEP AT HOTELS

The write-ups on new hotel openings in *The New York Times* and elsewhere over the last few years all seem to include the term "well-being." Properties from New York City to, well, the ends of the Earth, all seem to be set on enhancing the well-being of their guests via design and amenity/service options – and nothing increases our well-being faster or better than a good night's sleep. Trip Advisor even allows people to rate how well they've slept in various hotels. Based on multiple research study findings that focus on the importance of design, this topic summary report synthesizes multiple resources on how hotel design can increase the likelihood of deep, restful, guest sleeps.

INFLUENCERS

- Hotel room conditions
  - Lighting[1*,2,3] (room not too light or too dark[1*]; sunlight present[3])
  - Room temperature[1**,2]
  - Noise[1*,2,3] (from noise in hall/from another room/related to HVAC[1*]; from street or HVAC[3])
  - Odor[1**]
  - Mattresses[1*,2,3]
  - Pillows[1*,2,3]
  - Duvet/Bedding[3]
- Hotel/Room amenities (or lack of)[4]
- At-hotel facilities (number of floors at the hotel)[2]
- Hotel location (number of restaurants nearby)[2]

*business travelers
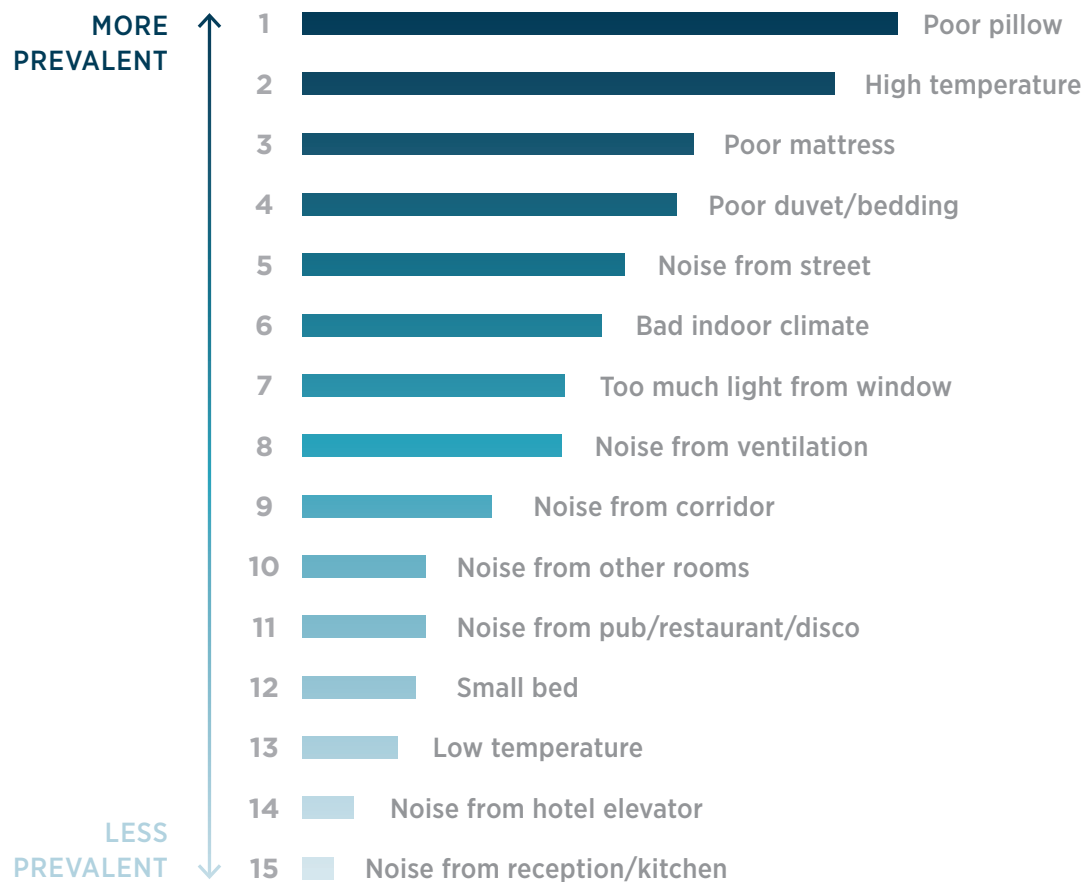**business travelers in mid-scale hotels

DESIGN IMPLICATIONS

- Create "cool, dark, quiet, and comfortable hotel rooms" (traveler preference)[2]
- Provide personal choice (e.g., guests choose between different pillows, room temperature control[3])
- Block excessive light (e.g., "install proper night lamps, remove light-emitting or distracting electronic devices from rooms, install blackout window shades or curtains, and supply eye masks for guests"[2]; install sunlight blocking curtains[3])
- Provide sound abatement measures (e.g., "soundproof building material," "nighttime quiet hours policy"[1*,2])
- Ensure HVAC system is in good working order[2]
- Set temperature to about 68 degrees Fahrenheit ("ideal room temperature should be about 20 degrees Celsius"[3])

RANKING OF SLEEP DISTURBING FACTORS[3]

(rank order of percentages that indicate the prevalence of respondents that reported being "often" or "very often or always" affected by these factors when staying at hotels)

MORE PREVALENT ↑

1		Poor pillow
2		High temperature
3		Poor mattress
4		Poor duvet/bedding
5		Noise from street
6		Bad indoor climate
7		Too much light from window
8		Noise from ventilation
9		Noise from corridor
10		Noise from other rooms
11		Noise from pub/restaurant/disco
12		Small bed
13		Low temperature
14		Noise from hotel elevator
15		Noise from reception/kitchen

↓ LESS PREVALENT

A NOTE ON RESEARCH METHODS

The common research method used in studies on this topic includes surveying hotel guests that possessed the characteristics of the target interest (e.g., business travelers, green hotel guests, etc.), using questionnaires, images, and interviews. Some studies also accessed secondary data such as TripAdvisor hotel reviews and advertisements. Here's a summary of the research methods used by each article reviewed for this resource:

- Survey of 304 business travelers who had stayed in a hotel for a minimum of 2 nights in the last 30 days[1]
- Online survey of over 2,500 people[3]
- Survey of 600 people who had stayed in hotels in the southeastern region of the U.S. and on-site interviews with another 600 people who had stayed in hotels in the southeastern U.S.[5]
- Online survey of over 400 hotel users in the U.S. who indicated that they had stayed at green hotel(s)[6]
- Photograph-based interviewing and surveying[7]
- An analysis of data in TripAdvisor reviews of hotels[2,4,8]
- Survey of 369 guests at six different Norwegian hotels[9]
- Data gathered from hospitality managers and design experts (architects, interior designers, and environmental psychologists) via analysis of secondary data such as advertisements, internal reports, and interviews in the business press, and by conducting interviews with hospitality managers and design experts in Norway[10]

ANNOTATED BIBLIOGRAPHY

A summary of each scholarly research study reviewed on this topic is included in this section, with a full citation of the source for additional reference.

SLEEP QUALITY

[1]Chen, H., Severt, K., Shin, Y., Knowlden, A., & Hilliard, T. (2018). How'd You Sleep? Measuring Business Travellers' Sleep Quality and Satisfaction in Hotels. *Journal of Hospitality and Tourism Insights, 1*(3), 188-202.

Via a survey of business travelers who had stayed in a hotel for a minimum of two nights in the last 30 days (304 study participants), "there was a difference in the factors that influenced business travelers' overall satisfaction with sleep in mid-scale (2.5-3.5 stars) vs. upscale hotels (4+ stars)...Regarding hotel attributes that are related to business travelers' sleep quality in hotels, over 25 percent of business travelers reported that 'noise in the hallway,' 'noise from another room,' 'sound of the A/C or heater unit,' 'pillows are uncomfortable,' and 'mattresses are (sic) uncomfortable' were major attributes disturbing their sleep quality...hotels should consider installing a soundproofing system to reduce unwanted noise for hotel guests...sensory elements inside the hotel room (smell of the room, room too light or too dark, sound of air conditioner, and temperature control in the room) significantly influenced business travelers overall satisfaction with sleep quality in mid-scale hotels, but not upscale or higher level hotels."

[2]Mao, Z., Yang, Y., & Wang, M. (2018). Sleepless Nights in Hotels? Understanding Factors That Influence Hotel Sleep Quality. *International Journal of Hospitality Management, 74*, 189-201.

Mao, Yang, and Wang (2018) found that how well hotel guests sleep is influenced by hotel location, at-hotel facilities, and conditions inside individual hotel rooms. Via an analysis of data in TripAdvisor reviews of hotels in Los Angeles, the researchers linked sleep quality to the number of stars hotels received on a quality rating scale, as well as "nearby restaurant density, number of hotel floors, and the hotel sleeping environment." Regarding room specific factors, the Mao-lead team reports that "our findings revealed the importance of mattresses, pillows, room temperature, noise, and lighting to sleep...travelers prefer a cool, dark, quiet, and comfortable hotel room for high-quality sleep." Also, "hotels should actively implement sound abatement measures by using soundproof building material and adopting a nighttime quiet hours policy... we recommend that hotels install proper night lamps and remove light-emitting or distracting electronic devices from rooms, install blackout window shades or curtains, and supply eye masks for guests. Because room temperature is another salient factor affecting sleep quality,...it is important to ensure that the HVAC system is in good working order."

[3]Pallesen, S., Larsen, S., & Bjorvatn, B. (2016). 'I Wish I'd Slept Better in That Hotel' – Guests' Self-Reported Sleep Patterns in Hotels. *Scandinavian Journal of Hospitality and Tourism, 16*(3), 243-253.

Pallesen, Larsen, and Bjorvatn (2016) investigated quality of sleep in hotels. Via an online survey of over 2,500 people they learned that, "The four disturbing factors reported by more than 15 percent of respondents were poor pillow (25.4 percent), high room temperature (22.8 percent), poor mattress (16.7 percent), and poor duvets/bedding (15.9 percent)...Noise from the street or from the ventilation system in hotels was mentioned by more than 10 percent of the sample as factors frequently disturbing their sleep in hotels...less than 4 percent were frequently bothered by too low room temperatures...the rule of thumb is that the ideal room temperature should be about 20°C...About 11 percent reported that their sleep in hotels was frequently impaired by too much daylight from windows...Several of the aforementioned factors could be corrected by simple means, such as allowing guests to choose between different pillows, reducing the room temperature, and using light blocking curtains."

[4]Rhee, H., & Yang, S. (2015). Does Hotel Attribute Importance Differ by Hotel? Focusing on Hotel Star-Classifications and Customers' Overall Ratings. *Computers in Human Behavior, 50*, 576-587.

Integrating the findings from multiple case studies, Rhee and Yang used data collected from the TripAdvisor website "to examine the differences in the relative importance of the six hotel attributes (value, location, sleep quality, rooms, cleanliness, and service)...The guests at two-star hotels would consider sleep quality to be important because there are no extra things that could entertain or attract them...However, the four-star hotel questions did not place too much importance on sleep quality. They could overlook this criterion because they completely trust in the hotel to provide more than adequate sleep quality...sleep quality was evenly significantly considered by guests from both low- and high-rated hotels."

WELL-BEING

[5]Chen, R. (2015). From Sustainability to Customer Loyalty: A Case of Full Service Hotels' Guests. *Journal of Retailing and Consumer Services, 22*, 261-265.

Chen (2015) studied experiences in ecofriendly hotels. She distributed surveys to 600 people who had stayed in hotels in the southeastern region of the United States and conducted on-site interviews with another 600 people who had stayed in hotels in the southeastern United States. Chen reports that "technology-related factors (such as high speed Wi-Fi, an easy-to-use remote, eco-self-climate control, and mobile devices) have an impact on a guest's lodging selections...the most significant attributes in the selection of ecofriendly lodging are the levels of implementation of a recycle program, locally grown food options, ecofriendly cleaning supplies, energy-efficient lighting, water-saving plumbing fixtures, and the use of recycled materials."

[6]Lee, J., Hsu, L., Han, H., & Kim, Y. (2010). Understanding How Consumers View Green Hotels: How a Hotel's Green Image Can Influence Behavioural Intentions. *Journal of Sustainable Tourism, 18*(7), 901-914.

Lee, Hsu, Han, and Kim (2010) surveyed (online) over 400 hotel users in the U.S. who indicated that they had stayed at green hotel(s) to learn more about how an image as a green hotel influences potential guests' intentions to stay at that hotel. They studied "how a green hotel image can affect behavioral intentions (i.e. intention to revisit, intention to offer positive recommendations to others, and willingness to pay a premium). The findings confirm that cognitive image components (namely, value and quality attributes) can exert a positive influence on a green hotel's affective [emotion-based] and overall images…Quality attributes were found to be more powerful than value attributes…a functional attributes-based green positioning strategy is developed by communicating attributes and benefits of green products/services…a functional positioning strategy alone cannot guarantee the success of green positioning; because functional positioning can be easily copied by competitors." Hotel guests must reap emotional benefits from staying in a green room; for example, their altruistic actions may increase their feeling of well-being: "Therefore, an emotional-benefit-based positioning strategy is also needed to complement functional positioning."

[7]Pullman, M., & Robson, S. (2007). Visual Methods: Using Photographs to Capture Customers' Experience with Design. *Cornell Hotel and Restaurant Administration Quarterly, 48*(2), 121-144.

Pullman and Robson (2007) found that guests notice design elements at hotels that indicate the hotel's concern with their well-being and needs, and those that support high-quality functionality. The researchers combined "photograph-based interviewing and surveying" in their research. At the request of researchers, guests took photos of the hotels where they were staying. Content analysis of the images found that "women paid particular attention to form, interpreted here as the positive home-like attributes of design and the evidence of thoughtfulness revealed through design…men paid more attention to the functionality of design and were more critical of it."

[8]Radojevic, T., Stanisic, N., & Stanic, N. (2017). Inside the Rating Scores: A Multilevel Analysis of the Factors Influencing Customer Satisfaction in the Hotel Industry. *Cornell Hospitality Quarterly, 58*(2), 134-164.

Radojevic, Stanisic, and Stanic (2017) wanted to learn more about factors influencing customer satisfaction and well-being at hotels. The research team evaluated customer reviews on TripAdvisor and assessed 13,410 reviews of hotels in 80 major urban tourist destinations worldwide written by leisure travelers. Star ratings were the most reliable predictor of customer satisfaction — higher priced rooms generally had higher levels of customer satisfaction. Additional findings indicated that a larger number of hotel rooms "makes hotels congested and cause quality of service to deteriorate…Of the other observable hotel attributes, those with the most significant positive effects on customer satisfaction are as follows: free Internet, suites, wheelchair access, free high-speed Wi-Fi Internet, air conditioning, non-smoking hotel, babysitting, fitness center with gym, free parking, and dry cleaning. Attributes with the most significant negative effects on customer satisfaction are casino and gambling, pool, refrigerator in room, banquet room, shuttle bus service, meeting rooms, and mini bar." Items with larger effects are presented earlier on each list.

DESIGN ELEMENTS

[9]Heide, M. & Gronhaug, K. (2009). Key Factors in Guests' Perception of Hotel Atmosphere. *Cornell Hospitality Quarterly, 50*(1), 29-43.

Heide & Gronhaug (2009) collected survey data from 369 hotel guests at six different Norwegian hotels to learn more about the factors that contribute to hotel atmosphere and guest satisfaction. They "identified four stable and robust factors of atmosphere, namely, distinctiveness, hospitality, relaxation, and refinement. Distinctiveness was found to be the main factor in atmosphere; consequently, it is reasonable to assume that a certain degree of distinctiveness is a prerequisite for creating atmosphere. Beyond that, however, hospitability emerged as the main determinant for guest satisfaction, loyalty, and word of mouth...managers should avoid focusing on design features to the extent that hospitality suffers." The Heide/Gronhaug team recommends that "managers should build on the elements that make their place special. This could be natural features, such as a special location, or design elements — usually, architecture and décor...atmospherics and social factors could be used consciously to reinforce the effects of these elements."

[10]Heide, M., Laerdal, K., & Gronhaug, K. (2007). The Design and Management of Ambiance— Implications for Hotel Architecture and Service. *Tourism Management, 28*(5), 1315-1325.

Heide, Laerdal, & Gronhaug (2007) investigated hotel ambiance and its experience-related implications, gathering data from hospitality managers and design experts (architects, interior designers, and environmental psychologists) via analysis of secondary data such as advertisements, internal reports, and interviews in the business press, and by conducting their own interviews with hospitality managers and design experts in Norway. The design experts reported that "architects have six tools for creating the desired ambience: (1) shape, (2) proportion, (3) texture/materials, (4) color, (5) lighting, and (6) furnishings. Shape and proportion are tools for changing and transforming the open space into a different setting, as well as to create specific settings. Texture and color define the character and qualities of the material. Lighting is used to reinforce the desired daylight or evening atmosphere and can for example be utilized to alter the informal breakfast atmosphere of the room into a formal evening setting. Choice of furnishing completes the impression created by the other elements combined." In contrast, "The hospitality managers were generally more concerned than the design experts with social factors and their impact as drivers of ambience." Distinctiveness and genuineness (in both materials and social interactions, between staff and guests, for example) have a significant effect on ambiance.

CONCLUSION

Research indicates that the well-being of people using hospitality services, and their ability to sleep, is enhanced by design that recognizes and supports their physical, cognitive, and emotional welfare.

For a review of the dangers of sleep deprivation, download this infographic created by the Johns Hopkins sleep research team.

If you are interested in learning more about well-being in general, take a look at the free, online *Handbook of Well-Being*, edited by Diener, Oishi, and Tay (2018). Sections are written by internationally recognized experts in each topic area. The introduction to the *Handbook* clearly indicates why the text is important: it reviews "the science of when and why people experience and evaluate their lives in positive ways, including aspects such as positive feelings, life satisfaction, and optimism. There are chapters in this eHandbook on the philosophy and history of well-being, as well as reviews of empirical research on the ways to assess well-being, the circumstances that predict it, the outcomes that it produces, the societal policies that enhance it, and many other social, biological, and cultural processes that help us understand why some people are happy and satisfied with their lives, while others are not."

ABOUT THE AUTHOR

SALLY AUGUSTIN, PH.D., is a practicing environmental psychologist and a principal at Design with Science. She has extensive experience integrating science-based insights to develop recommendations for the design of places, objects, and services that support desired cognitive, emotional, and physical outcomes/experiences. Her clients include design firms, manufacturers, and service providers worldwide.

Dr. Augustin has talked about using design to enhance human performance and psychological well-being on mass-market national television and radio programs in the United States and in Europe as well as on cnn.com and bbc.com. She speaks frequently to audiences in North America, Europe, and Asia at events such as WorkTech, the International Design & Emotion Conference, the bi-annual meeting of the Association of Neuroscience for Architecture (ANFA), NeoCon/IIDEX, the APA's annual meeting, the EDRA annual conference, Living-Futures, and Applied Brilliance.

Dr. Augustin is a Fellow of the American Psychological Association, holds leadership positions in professional organizations such as the American Psychological Association (APA) and the Environmental Design Research Association (EDRA). She is the author of *Place Advantage: Applied Psychology for Interior Architecture* (Wiley, 2009) and, with Cindy Coleman, *The Designer's Guide to Doing Research: Applying Knowledge to Inform Design* (Wiley, 2012). Sally's work has been discussed in publications such as *The New York Times*, *The Wall Street Journal*, *The Guardian*, *Forbes*, and *Psychology Today*.

Dr. Augustin is a graduate of Wellesley College (BA in economics), Northwestern University (MBA, majors in finance and marketing), and Claremont Graduate University (Ph.D., psychology).

ASID RESEARCH: TOPIC SUMMARY

ASID Research Topic Summary reports consolidate recent scholarly research papers relevant to a specific topic with the purpose of identifying key design considerations based on research evidence. In addition to the synthesis of research findings, we've included summaries of each research study referenced to provide a general overview. For more information on the details of each study, please use the citations to access full articles.

ABOUT ASID

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