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The role of the physical environment on formal and informal mindfulness: the sensory retreat experience

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ABSTRACT

A sensory engagement with the surroundings lies at the heart of awareness. Mindfulness practices cultivate such awareness, where the physical environment is a significant feature. However, the synergy between mindfulness practices and the physical environment has received little scholarly attention. This study focuses on the "retreat experience" to explore how mindfulness practitioners perceive the physical environment – both natural and built – through their formal and informal mindfulness practices. We investigated the unfolding of the sensory experience within two settings throughout the duration of the retreat. Data was collected through participatory observation and in-depth interviews with nine retreatants, the mindfulness instructor, and two retreat center operators. Results provide us with insights into the rich interplay between the inner and outer worlds, where sensory awareness plays a crucial role in cultivating presence and practice. Besides the expansion of each sense and their multi-sensory interaction, the perception of the retreat setting's spatial interreations is also crucial for providing retreatants with meaningful encounters with the surroundings.

KEYWORDS

Mindfulness; well-being; sensory experience; retreat setting; contemplative environments

Architecture is the art of reconciliation between ourselves and the world, and this meditation takes place through our senses.

– Juhani Pallasmaa (2005, 50)

Introduction

Embodied encounters with the physical environment shape our everyday interaction with the world. Through active, ever-changing engagement, spaces are not passively observed but dynamically interacted with (Hockey 2006). Designers, through the design of the environment, have the potential to enhance human experience and activity when they are aware of the body's ever-changing needs and activities. Johnson supports this, calling for an "embodied view of mind and meaning to appreciate the significance of architecture" (Johnson 2015, 40). This embodied state of mind within an environment can be achieved by activating the full range of senses (Malnar 2017). Our experiences in both built and natural environments are shaped by the combined influence of all senses

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(Spence 2020). With the expanding research on the multisensory nature of the mind, the role of embodied engagement in architecture has also become increasingly recognized. This leads architects to explore not only visual elements but the role of other senses (Spence 2020). Lehman (2009) states;

> The architect must act as a composer that orchestrates space into a synchronization for function and beauty through the senses – and how the human body engages space is of prime importance. As the human body moves, sees, smells, touches, hears and even tastes within a space – the architecture comes to life.

Originating from Buddhist roots, mindfulness has spread into Western culture over the past three decades, with scientific and medical studies (Shapiro and Weisbaum 2020). Mindfulness refers to a particular kind of awareness, "a human capacity for attention and self-knowing" (Kabat-Zinn 2005, 11). Mindfulness is also described as a qualitative state of consciousness that allows one to be fully engaged in the present moment (Brown, Ryan, and Creswell 2007). People grow, change, learn, and become aware through their five senses, along with their mind, with the aid of mindfulness practices (Kabat-Zinn 2005). It involves directing attention and awareness to the sensory, cognitive, and emotional dimensions of each experience (Hebert 2016). Since sensory processing patterns significantly impact daily engagement, Hebert's study (Hebert 2016) found a strong relationship between individuals' sensory processing styles and their ability to engage mindfully in everyday life. Also, a recent study suggests that post mindfulness training, individuals engage more deeply with their sensory and environmental experiences in daily life (Kaya, Sezerel, and Filimonau 2024). Mindfulness practices share a similar intention with architecture – to enhance our understanding of how we relate to the world, moment by moment, and recognize the qualities (both internally and externally) that enhance our presence. Feldman and Kuyken (2019) highlight that being mindful is remembering where we are, as the elements of experience "are perceived and held in awareness where they can be explored with attitudes of curiosity, patience, and kindness" (12–13). Accordingly, our experience changes based on the five constituent components: bodily sensations, emotions, thoughts, behaviors, and the "context" (Feldman and Kuyken 2019).

Although mindfulness is often regarded as an inner practice, the influence of the environment cannot be ignored. Just as our lives shape the world, the world in turn shapes us in "a symbiotic dance of reciprocity" (Kabat-Zinn 2005, 3). Reviewing the mindfulness literature, it has been predominantly studied from scientific and medical perspectives, while fewer studies have examined how mindfulness practices are influenced by the physical environment. Altay (2021) focused on sensory perceptions within public interiors when participants were mindful of their spatial interactions. They recently reviewed studies on the interrelation of mindfulness practices with natural and built environments from a public health perspective (Altay and Porter 2024). Two studies explored the relationship between formal practice and the Buddhist contemplative space (Chen, Porter, and Tang 2022), and the effects of spatial features on formal meditation (Chen and Tang 2024). Their research revealed that places with specific qualities incorporating sights, sounds, smells, and bodily comfort facilitate formal practice. Situated within a Buddhist framework, these studies highlight how spatial features affect formal practice.

With secularization, mindfulness has evolved from Buddhist traditions into everyday practices. which Nhat Hanh (1987) emphasizes, being mindful requires having mindful awareness 24 hours a day. Besides formal practices, informal daily practices have also become an important consideration. Not only spaces for formal practice, but also the environments of everyday life, become significant in mindfulness experiences. Thus, this study focuses on where both formal and informal practices are intentionally carried out, such as retreat centers. The rise in the pace of modern life and the secularization of mindfulness have led to an increase in retreat centers (Eddy 2012). Secular retreats represent the secular interests of Westerners or host multiple frameworks beyond Buddhism. They are unique hospitality units providing substantial recreational space and amenities throughout a guest's stay (Eddy 2012; Fu, Tanyatanaboon, and Lehto 2015). They offer activities along with therapies, treatments, and food plans, where cultivating the body – mind – spirit integration is prominent (Norman and Pokorny 2017) in purpose-built environments. The physical environment serves as an instrumental space for being present, shaping the diverse sensory experiences. Sucitto (2024) describes retreats as a space of care and notes: "You're not constantly being bombarded with stuff, nothing grabs your eye, nothing to think about or fiddle with, and yet it's intelligent because it's careful in the sense it's carefully spaced."

Despite the potential impact of retreat settings on mindfulness, this relationship has not been sufficiently investigated. Mindfulness cultivation is inherently sensory (Kabat-Zinn 2005), and sensory engagement has also become increasingly central in architectural research (Spence 2020). When these perspectives are brought together, the context of retreat emerges as a unique sensory setting in which to explore these questions:

RQ1. In what ways do the interior and exterior environments of retreat centers support or hinder the mindfulness practices of participants?

RQ2. How do sensory experiences (sight, sound, touch, smell, and taste) contribute to the mindfulness practices of participants in retreat settings?

Materials and methods

This study was conducted in two secular retreat centers in Turkey. Both retreat programs shared similar structures, durations (four days), and were facilitated by the same mindfulness instructor, Berrak Yurdakul. She is a renowned writer and instructor in the fields of mindfulness and Buddhist Dharma teachings.

The first retreat program took place from October 26 to 29, 2023, at Karakaya Retreat Center in Muğla, Turkey. The center is situated in a natural valley, comprising eight stone buildings (Figure 1).

The largest is a naturally lit multi-functional space – Building A, "*shala*" within the context of a mindfulness retreat (Figure 2(a)). Building B, which houses the dining hall and kitchen, opens onto an outdoor terrace (Figure 2(b)). Six buildings -Buildings C-H are used for accommodation with varying room types (Figure 2(c,d)). The outdoor areas feature a pool, seating units, and fire pits designed for social interaction (Figure 2(e,f)) and are all

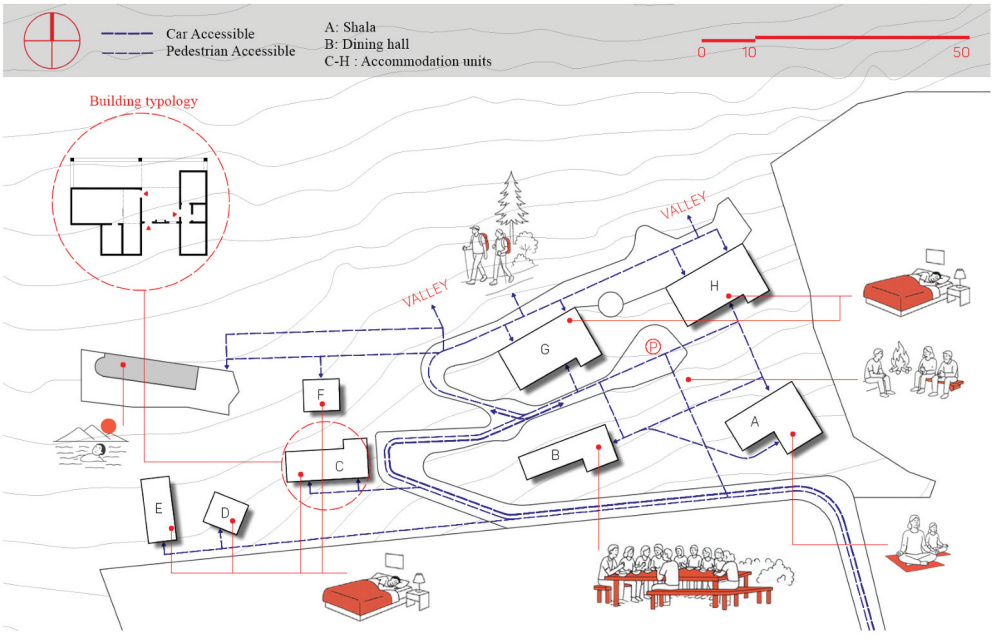

Figure 1. Site plan, activities, and circulation pattern of Setting 01 (Karakaya retreat center). Created by the first author.

connected by natural pathways. The buildings share the same typology: a veranda connecting two buildings on either side, and a terrace opening onto the valley.

The second retreat program was held between April 18 to 21, 2024, at a center in Antalya, Turkey. The center is composed of 15 buildings designed to blend seamlessly with the surrounding forested landscape, situated among mountains (Figure 3).

Building B is a two-story structure that functions as a dining hall, connected to a veranda (Figure 4(a)). Building A, *shala*, is a lightweight steel and glass structure elevated from the ground, with a surrounding deck accessible through all-around sliding glass doors (Figure 4(b,c)). Wooden accommodation buildings, Buildings C to N, are dispersed across the center, accessible by pathways (Figure 4(d)), and lead to a nearby stream offering a unique natural experience (Figure 4(e)). Service buildings include laundry and public restrooms. There is also a natural pool fed by the stream (Figure 4(f)).

During the retreats, participants attended theoretical lectures, engaged in formal and informal mindfulness practices, and took part in meal sessions and breaks (see Table 1). The theoretical classes in which mindfulness and dharma talks were given were held in the *shala*. The meditation sessions included formal practices such as loving-kindness meditation, vipassana meditation, and body scan. They mainly took place in the *shala*, but the space varied depending on the type of practice, such as a mindful walking in nature or a mindful eating in the dining hall. Meals were served twice a day in the dining hall: breakfast and dinner. There were also break

Figure 2. Visuals from Setting 01 (Karakaya retreat center). (a) *Shala* designed with natural materials, (b) Terrace of the dining area, (c) Accommodation unit inspired by local architecture, (d) Interior of double room, (e) Fire pit for socializing in the evenings, (f) Pool overlooking the valley. Photographed by the first author.

times where retreatants preferred to spend in nature, socializing with others in the dining hall, or relaxing in their accommodations.

Participants

Participants, including the first researcher, had completed a foundational mindfulness program and were eligible for the retreats. The retreats hosted 22 and 24 retreatants, respectively. The participants were selected by purposive sampling, which involves choosing individuals with relevant knowledge and willingness to participate (Rai and Thapa 2015). In addition to the first author, a total of 12 interviews were conducted six to twelve months after the retreats were completed (see Table 2). To identify potential factors that could influence these experiences, all participants reported no sensory impairments, except one who mentioned light sensitivity due to cataracts.

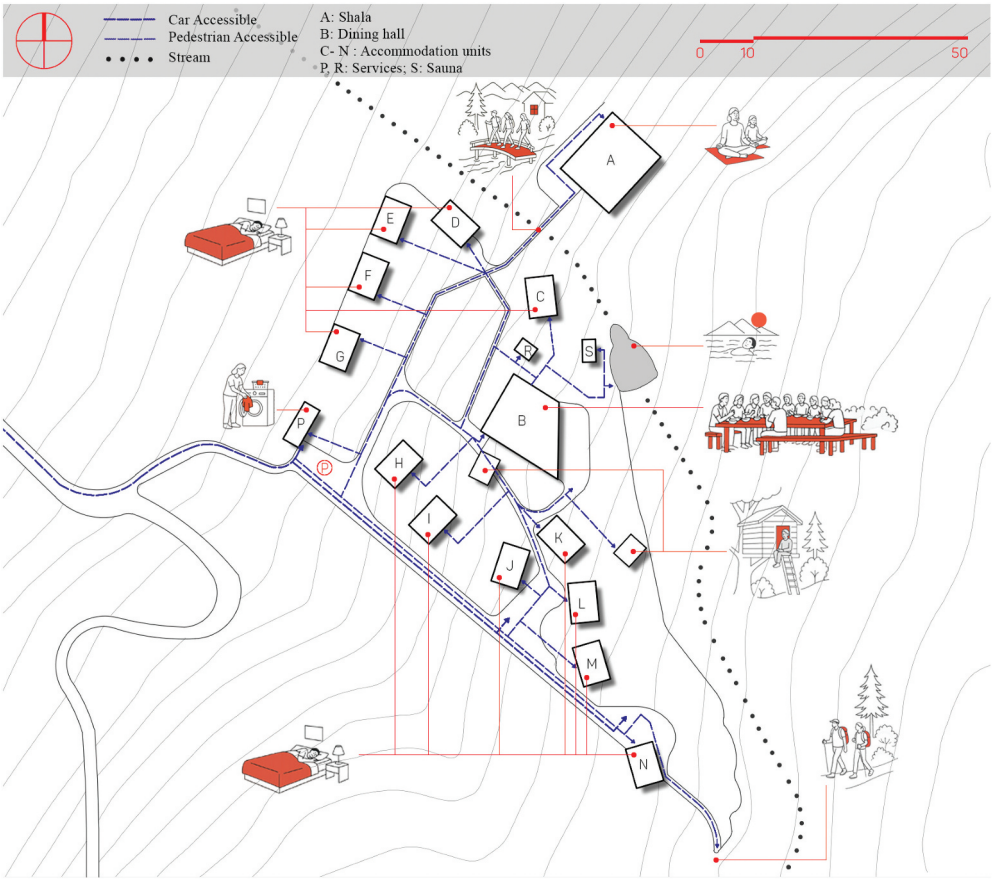

Figure 3. Site plan, activities, and circulation pattern of Setting 02 (the Land retreat center). Created by the first author.

Before the interviews, we obtained ethical approval from Bilkent University's ethics committee. Interviews lasted 15–30 minutes and were conducted over Zoom, with the participant's consent, and recorded. Recordings were transcribed and number-coded for privacy and then translated into English using ChatGPT 4.0. The translation was reviewed and verified by both researchers.

Procedure

An exploratory qualitative research methodology was employed, combining auto-ethnographic reflections with data from in-depth interviews. This method is suitable for topics with limited prior research (Stebbins 2001). Auto-ethnographic data were collected daily through the first researcher's diaries, notes, photographs, and self-reflective inquiry. Building on previous work that examined formal meditation in Buddhist contemplative spaces (Chen, Porter, and Tang 2022), the semi-structured interview framework was adapted to the retreat context by adding supplementary questions. Drawing on space memory research, the Critical Incident Technique – a qualitative research method in

Figure 4. Visuals from Setting 02 (the land retreat center). (a) Dining terrace with various seating options, (b) *Shala* with sliding façade blending into nature, (c) Wrap-around deck encircles the *shala* (d) Accommodation unit with natural materials, (e) Stream along the retreat site, (f) Stream-fed natural pool. Photographed by the first author.

Table 1. Retreat schedule for both retreats.

Retreat Schedule	
Day 1	**Day 2,3**
16.00- 17.00 Introduction and Theoretical Class	07.30- 08.30 Meditation
17.00 Dinner	09.00 Breakfast
19.00- 20.00 Theoretical Class	12.00- 13.30 Theoretical Class
21.00- 22.00 Meditation	13.30- 15.30 Break
Day 4	15.30- 17.00 Theoretical Class
07.30- 08.30 Meditation	17.00 Dinner
09.00 Breakfast	19.00- 20.00 Theoretical Class
11.00- 12.00 Closing Session	21.00- 22.00 Meditation

which participants recall and recount an experience they have had (Douglas et al. 2009) – was employed to capture detailed and vivid accounts of specific retreat experiences. The structure of the interviews allowed flexibility to deepen initial themes based on participants' responses.

Table 2. Study participants.

Participant INS: Instructor O: Operator of the center P: Participant R: Researcher	Gender M: Male F: Female PNTS: Prefer not to say	Age	Mindfulness Meditation Background Beginner: (0–3 years) Intermediate: (3–6 years) Experienced: (6+ years)	Frequency of Meditation Practice	Attended Retreat Center
INS	PNTS	51	Experienced	Every day, twice a day	Both
O1	M	40	Intermediate	2–3 times per week	Karakaya Retreat Center
O2	F	42	Intermediate	4–5 times per week	The Land Retreat Center
P1	F	62	Experienced	Every day, twice a day	Karakaya Retreat Center
P2	F	43	Intermediate	4–5 times per week	Both
P3	F	52	Beginner	Everyday	The Land Retreat Center
P4	F	45	Intermediate	Every day, twice a day	Both
P5	F	43	Beginner	Every day, twice a day	Both
P6	M	39	Experienced	Every day, twice a day	The Land Retreat Center
P7	F	43	Beginner	2–3 times per week	The Land Retreat Center
P8	M	47	Beginner	Everyday	Both
P9	F	55	Intermediate	4–5 times per week	Karakaya Retreat Center
R	**F**	**36**	**Intermediate**	**4–5 times per week**	**Both**

Note. In addition to the participants, the first author was also included in the table as an ethnographic observer.

Our initial themes were rooted in mindfulness literature and supported by architectural theory. We drew on the framework of Jon Kabat-Zinn (2005), one of the leading pioneers in bridging science with meditative traditions. He emphasized the cultivation of mindfulness through the five senses, conceptualized here as *sightscape*, *soundscape, touchscape, smellscape*, and *tastescape*. In addition, we incorporated perspectives from architectural discourse, particularly Pallasmaa's (2005, 72) *The Eyes of the Skin: Architecture and the Senses* and Spence's (2020) *Senses of Place: Architectural Design for Multisensory Mind*, which highlight the multisensory nature of spatial experience, as well as Altay's (2021) study on the multisensory experience of public interiors. By combining these interdisciplinary perspectives, we identified a priori themes before research that address both the sensory basis of mindfulness practices and the embodied experience found in retreat environments.

Interview structures were designed for the instructor, center operators, and participants, sharing a common foundation but incorporating specific questions specialized to each group (see Appendix for participant interview questions). The data were subjected to thematic analysis using Braun and Clarke's (2006) six-level category system, focusing on sense-based themes grounded in the essence of mindfulness and informed by both mindfulness and architectural literature, and complemented by the first researcher's observations.

Results

Mindfulness is cultivated through the deep embodiment of all senses, which also forms the foundation of our experience of space. Our initial themes: *sightscape,*

Table 3. The coding structure.

	Themes	Subthemes	Sample codes
A Priori Themes (defined before analysis, based on literature)	**Sightscape**	View	Open, Unobstructed views, Natural landscapes
		Design Features	Textures, Natural materials, Natural colours
		Natural Features	Sunlight, Landscape, Moonlight, Lights of the forest
	Soundscape	Natural Sounds	Rain sound, Sound of water from a pond, Sound of nature, Bird sound,
		Silence	Absence of other sounds, Silence accompanied by nature
		Artificial Sounds	Bells, Gongs, Background music
		Distracting Sounds	Added sound, Construction sound, Chair movement sound, Car horn
	Touchscape	Design Features	Natural materials, Sharpness of the stones, Natural soil trails
		Temperature	Warm, Shaded areas, Cold coming from the ground, Icy water touching feet
	Smellscape	Natural Aromas	Scent of pine and forest, Earthy aroma, Scent of the natural materials, Smell of the fire pit
		Intentional Use of Scents	Orange-scented essential oil, Sandalwood incense
		Memory Association	Childhood, Scent as a portal, Connecting the layers of ourselves
	Tastescape	Spatial and Social Contexts	Sitting in a circle with others, Respectful distance, Sense of shared silence, Spaciousness
		Mindful Recognition of Flavors	Crunch of the bread, Aroma of the soup, Warmth of the tea, Mouthfeel, Textures, Sweetness of a ripe tomato
		Preparation and Sourcing of Food	Vegetables from the center's garden, Locally sourced, Seasonal ingredients, Food as a practice- eating and preparing
Emergent Themes (identified during analysis, grounded in data)	**Multisensory Experiences**	Natural Environment	Feeling the warmth, seeing light and shadow effects of the sun, Walking on the stones, collecting them
		Built Environment	Touching and smelling the wood, Smelling and seeing the forest
	Spatial Inter-relationships	*Shala* and Its Position	Elevated and open to the horizon, Spacious, Sense of grounding, Sacred space, A gathering space, Going to the *shala* as a ritual
		Transitional Pathways	Path like a journey inward, Engaging with the environment, Invitation, Preparing for the practice, Slowing down
		Communal and Solitary Spaces	Private spot in one's room, Processing the collective energy, Turning inward

soundscape, touchscape, smellscape, and *tastescape* were developed by integrating mindfulness literature (Kabat-Zinn 2005) with architectural theories on multisensory experience (Altay 2021; Pallasmaa 2005; Spence 2020). Beyond these five core sensory dimensions, the research revealed two overarching themes: *multisensory experiences* and *spatial inter-relationships* (see Table 3). The following exploration includes both interview comments and the observation notes of the first researcher.

Sightscape

Kabat-Zinn (2005) defines seeing as more than just looking; it is a mindful and active interaction with the world, likened to "tuning an instrument" that leads to enhanced sensitivity, clarity, and range. Through sight, we witness how the world is changing every second, offering us a brand-new perspective while remaining the same.

The interaction between environment and perception is reflected in how participants described their sight experiences in different spaces of retreat centers. Most reported that open, unobstructed views and natural landscapes contributed to their practices. P03 described her experience in Setting 02:

> There was this entirely glass-enclosed, very thin structure, and the windows didn't give any sense of enclosure. I really liked how they used such a light structure … They've created something that completely dissolves the boundaries of the *shala*. You can enter and exit from anywhere. You can completely open the facades, bring the whole forest inside.

P05 noted the impact of openness: "There was something about seeing the mountains and open sky that helped me let go of distractions. I felt like my mind opened up with the landscape," while P08: "I found myself more attuned to details I usually overlook, like the subtle shifts in sunlight as the day progressed, each one a reminder of change and impermanence." The first researcher also observed that design features such as glass walls, open layouts, and natural light blurred the boundaries between indoor and outdoor spaces, enhancing the sense of immersion.

The participants highlighted the impact of interior design features such as colors, textures, and materials on their practice. P02 reflected on the grounding effect of the design, joined by natural light, when she opened her eyes in the morning:

> I was very happy at Setting 01. It had shared bathrooms, but the stone house made me so happy. The light hit those uneven, natural stone walls; they had carved small niches into the stones and placed figures inside them. My room didn't face the view, but every morning the light would filter in and illuminate the uneven reflections on the stones. That was a mindful moment for me.

The material-sun interplay was recognized by P06: "Sunlight filtering through the *shala* illuminated the textures of wood and stone, creating shifting patterns that became moments of stillness." For the colors, neutral and earthy tones were often described by the participants as relaxing, in contrast to vibrant artificial tones. The operator of Setting 01 supported this insight, highlighting how natural tones and minimal stimuli help the

mind stay present: "Bright, colorful environments may seem festive but can overstimulate and distract the mind."

The instructor emphasized the importance of the surroundings, noting that "the beginner's mind is often restless and undisciplined, so a simple and visually calming environment is crucial. Spaces with fewer visual stimuli help settle the mind and support focus." She suggested that creating a peaceful, harmonious space would benefit practitioners in many ways, such as enhancing their ability to concentrate and connecting more deeply with their practice.

Soundscape

In mindfulness, hearing is more than perceiving sounds; it is considered an act of receiving. Kabat-Zinn (2005) argues the importance of simply existing within the sounds "without any embellishment, without any trying" (202). As Feld (2005) notes, sound is not merely processed but exhibits a sense of place and presence; thus, it links the auditory with spatial and emotional elements.

Participants shared how natural sounds enhanced their practices, providing a unique experience. The first author recalled a meditation in Setting 02:

> Our morning 20-minute breath meditation began seated but quickly became a reclining one when a sudden rainstorm hit. Our instructor encouraged us to use the rain as an anchor, and we were given some blankets to keep warm as we lay down and closed our eyes. The sound of each raindrop hitting the *shala*'s roof, sometimes intensifying and sometimes softening, created an unexpected experience that kept us entirely in the moment. Time seemed to melt away, leaving us in an indescribable state of peace and silence accompanied by the sound of the rain.

P06 reflected on the sound of water coming from a pool near *shala* in Setting 02: "There was a frog in the pond. The sound of water droplets hitting the surface made a 'pang' sound. It felt so natural and comforting, almost like a special effect tailored for mindfulness." As such, P01 suggested that even an artificial water sound could be effectively incorporated into formal practice spaces.

Silence also played a significant role, offering another dimension of auditory awareness. For P04, the combination of silence and natural sounds was transformative: "The quiet allowed me to hear the birds clearly, and somehow that clarity brought me into the moment. It felt like nature itself was guiding the meditation." P06 found comfort in the natural sounds: "Even the rustling of leaves felt like part of the meditation – it was as if the environment was encouraging me to keep listening, without adding any interpretation."

On the other hand, artificial sounds, such as bells, gongs, and background music, were functional auditory anchors. The instructor emphasized, "For beginners, sounds can serve as reminders to come back to the present moment. They help establish discipline and a rhythm to the practice."

Unexpected experiences were shared, such as by P09: "The silence was so complete at times that it felt like an added sound, pressing on me, creating a feeling of both liberation and confinement." P10 observed a similar duality when the sounds of construction intruded: "The drilling was annoying at first, but then I realized I could use it as

a reminder to come back to my breath." Distracting sounds can sometimes become anchors for practice, yet one participant (P05) critiqued the physical locations of the centers:

> In Setting 01, there was construction nearby, all day long the drill was working. It was really in the city. To go to Setting 02, you drive 1.5 hours from the center. The other place is 15 minutes from the center. It is such a central place that its construction will never end. Maybe retreats could be held there when it is not construction season.

Distracting sounds, while initially disruptive, were noted to increase awareness in surprising ways. P06 shared his experience with his retreat friends in the dining area:

> I remember people dragging their chairs loudly. I never did that, but it made me realize I needed to slow down even more . . . While dining with the others, some would place their cutlery down noisily. Those made me pause and place mine more gently. Even as a ballet dancer, I noticed how much more softly I could walk and move—striving for a state of being less intrusive, less harmful, and more silent.

Touchscape

Kabat-Zinn (2005) emphasizes that "our body touches every chair it sits on, every piece of floor or ground it stands on, every surface it lies on . . . we can touch either mindfully or mindlessly" (215). Rybczynski (2001) emphasizes that beyond abstract qualities like space and light, architecture is a tangible experience shaped by material textures and surfaces: "the grain of the wood, the veined surface of marble, the textured pattern of brick." (89). The constant somatic contact reinforces the awareness of our presence.

In retreats, touch becomes a prominent sense through interactions with natural materials, temperature changes, and tactile experiences. Participants highlighted how contact with natural elements in outdoor spaces heightened their practice. P08 reflected on the grounding experience of walking barefoot on gravel paths: "The sharpness of the stones kept my attention focused; each step reminded me where I was, fully in my body and present." Similarly, P02 described walking through a cold stream during mindful walking:

> I took off my shoes to walk barefoot in the stream. The coldness of the water was intense, but instead of resisting, I let it guide me back to my senses. Each step was an act of balance, a negotiation between the uneven stones and the icy water, a true lesson in staying present.

P05 highlighted how walking on varied terrain to the *shala* enhanced her connection with the environment: "Walking along the beautifully rocky trail, I would feel each stone as I passed over it. I even picked up a few stones to keep in my pocket, a way to carry the moment with me." Accordingly, the center operator emphasized the importance of designing pathways: "Gravel paths, natural soil trails, or even stepping stones encourage people to slow down and feel every step, walking as a sensory meditation."

In the interior spaces, the use of different textures played an important role in the participants' experiences. P04 shared, "The feel of the wooden floor beneath me brought a sense of grounding. It felt natural, almost alive, and supported my practice." P07 likewise described her cushion as an anchor, its soft firmness complemented by the cool floor. P09

reflected on the tactile experiences: "Every time I touched the wooden deck and benches in the garden, I felt a connection to something ancient and natural; the wood itself had a calming influence."

Temperature was also indicated as a significant feature. P04 shared how sunlight influenced the atmosphere: "The sunlight filtered through the *shala*, creating an environment that felt both warm and vibrant … adding an unexpected layer to my practice." P06 reflected on her experience with temperature shifts: "Walking barefoot on the cold grass brought a refreshing clarity. The coolness traveled up my feet, anchoring me to the earth, while the rising warmth of the sun reminded me of the day's unfolding possibilities." The center operator also addressed the need for balancing temperature in retreat spaces: "Temperature must be carefully managed – too cold and it distracts; too hot and it becomes unbearable. Providing options for participants to adjust, like blankets for warmth or shaded areas." P05, who had attended both retreats, compared: "We went to Setting 01 in a hot season, it was very suffocating. At Setting 02 we also got very cold, but it didn't wear me out as much. In Setting 01, there were more than 40 people, and the shala's air conditioning wasn't working; the heat really challenged people."

Smellscape

Kabat-Zinn (2005) regards smell as a deeply primal sense that transports us to the present moment, evoking memories and emotions with an immediacy that few other senses can. Howes (2024) expands on this, the dual nature of smell as both inwardly and outwardly oriented. He observes that Western thought often highlights the importance of smell in connecting us to the past by evoking memories. In contrast, in other cultural contexts, such as India, smell serves more as a spatial sense, acting as a force that attracts without necessarily prompting memory recall.

Smell evoked mindfulness through three key aspects: the grounding effects of natural aromas, the intentional use of scents, and the recall of memories through olfactory elements. P05 reflected: "The scent of pine when walking between sessions became part of my practice, reminding me to breathe deeply and appreciate the moment." Similarly, P09: "After morning rain, the earthy aroma seemed to envelop me; each breath felt like an act of grounding, drawing me closer to the environment."

Olfactory elements like incense and essential oils were mentioned as both supporting or hindering mindfulness. P08 highlighted how incense transformed the atmosphere: "Once, in the *shala*, the orange-scented essential oil dripped onto the burning stove. Now, whenever I smell that scent, I am back to that moment that anchors me instantly." Conversely, another participant shared how scent can hinder mindfulness:

> There was a time when we meditated with sandalwood incense burning in the room. Something very traumatic happened to me during that session, and now that scent brings me back to that moment, no matter where I am. It's as though the scent becomes a portal, pulling me back into that memory, making it hard to stay present. For someone else, the same scent might be comforting or nostalgic. It's so subjective.

Scents also encountered in retreats stirred unexpected memories. P06 described how the smell of wet soil after rain transported her back to childhood: "It was as though I was

simultaneously in two places – my retreat and my childhood – and that dual awareness brought unexpected depth to my practice."

The instructor also spoke about the role of scent as ritual: "Lighting incense before a session is a mindful act in itself. The aroma creates a bridge between the external space of the room and the internal space of the practice. Scents are powerful in bringing hidden emotions to the surface. They don't just support mindfulness; they deepen it by connecting us to layers of ourselves we might otherwise overlook."

Tastescape

Kabat-Zinn (2005) emphasizes how mindful eating, like slowly savoring a raisin, can transform an everyday act into a profound exercise in awareness. Taste is also deeply tied to culture, memory, and social connection, with profound connections to cultural practices and social memory (Howes 2024).

Findings revealed three sub-themes: the influence of spatial and social contexts, the mindful recognition of flavors, and care in the preparation and sourcing of food. Considering the physical and social setup of dining spaces, flexible seating arrangements are allowed for both personal space and shared moments. P08 noted, "The design of the dining hall made a big difference. Sitting in a circle with others, while keeping a respectful distance, created a sense of shared silence that made each bite more meaningful." Similarly, P02 who had attended both retreats:

> The veranda, overlooking nature, with sunny and shaded areas to choose from, gave me the freedom to sit wherever I felt comfortable. I could sit on a table or at the high counter overlooking the vista. I wanted to sit with friends, I shared a table, if I wanted to be alone, I still had options. It felt liberating not to be confined to a single space. That's why I am pleased with Setting 02.

The retreat operator also emphasized: "We ensure that dining spaces encourage both mindfulness and community. Circular seating arrangements and natural lighting help practitioners feel both included and reflective." Silent communal meals were another highlight. As P03 described, "The shared silence during meals was transformative. Without conversation, I became more attuned to the act of eating – the crunch of the bread, the aroma of the soup, the warmth of the tea. It created a deep sense of connection, not just to the food but to everyone in the room."

Participants often reflected on how retreat environments fostered mindful eating and drinking. P09 noted: "It wasn't just about the taste; it was about noticing how the food felt in my mouth, the textures, the subtle sweetness of a ripe tomato. Every bite became an exploration." Likewise, P07: "Drinking water from the well was grounding. Its crisp, natural taste transported me to my childhood, reminding me of simpler times and deepening my sense of connection to the present moment."

The mindfulness embedded in the preparation and sourcing of food also added depth to participants' experiences. P05 reflected, "Knowing that the vegetables came from the center's garden made the meals feel more nourishing. You could taste the care that went into every dish." The center operator highlighted the philosophy behind meal preparation: "We focus on locally sourced, seasonal ingredients. This not only reduces our

environmental impact but also allows guests to experience the richness of the local region. Food becomes a practice, not just a necessity."

Multisensory experiences

Mindfulness is not limited to the engagement of isolated senses; rather, it thrives in the interaction of multiple senses. Howes (2006) highlights how environments are experienced as interconnected fields of perception rather than isolated sensory inputs. Spence (2020) reinforces this by recognizing the multisensory nature of the mind; architectural design can foster multisensory engagement of buildings and urban spaces. These spaces can more effectively support our social, cognitive, and emotional well-being (Spence 2020).

Participants highlighted experiences in which multiple senses were simultaneously activated, intensifying mindfulness. P02 recalled walking along a shaded trail to the shala, where the crunch of gravel, cool air, and shifting light created a multisensory moment: "It wasn't just walking; it was as if every step pulled me into the present through the sound, the texture, and even the light shifting through the trees." Similarly, P06 reflected on a morning meditation where the scent of earth after rain, combined with the birdsong and the cool touch of a breeze, made her feel as if it was "impossible to be anywhere but here."

The built environment also contributed to multisensory experiences. P04 remarked on how the warm light streaming into the *shala* during sunrise not only illuminated the textures of wood and stone but also created comforting warmth that she could both see and feel. "It was as if the light itself was inviting me to practice, wrapping the space in this golden glow that made everything feel alive and warm."

Retreat operators were also aware of the importance of multisensory design: "We intentionally integrate sensory elements – like the sound of water features near the meditation halls or the placement of flowers and fragrant plants such as lavender and thyme along walkways – to ensure that participants are drawn into their practice not just visually but through touch, scent, and even sound." Such multisensory experiences, while less frequently mentioned than single-sense engagements in participants' reflections, were often described as the most impactful moments of the retreat.

Spatial inter-relationships

Sucitto (2024) emphasizes the shaping influence of retreat setting characteristics, which, when thoughtfully designed, can support both the formal and informal practices of retreatants. This insight was also derived from the study's findings. Participants highlighted relationships, including *shala* and its position, the importance of transitional pathways, and the balance between communal and solitary spaces, with an emphasis on careful boundaries.

The *shala* emerged as a central sub-theme, seen as the retreat's heart. P04 reflected: "Arriving at the *shala*, elevated and open to the horizon, gave a sense of both grounding and expansion as if the entire retreat centered on this sacred space." This perception was reinforced by the design of the *shala* itself, which featured open layouts and panoramic views. P03 in Setting 02: "The *shala*'s large windows dissolved the division between inside

and outside. Even during seated meditation, I felt immersed in the forest, as if nature itself was part of the practice." P08 reflected both on the *shala*'s location within the retreat center and its architectural features:

> I wouldn't want it to be right underfoot, I would prefer it to be tucked away in a corner of the center, but I should always be able to go there. I should be able to go to the *shala* early before practice and sit. I think it is very valuable for it to be a quiet corner of the center. I would want it to be fully integrated with its surroundings. I don't want to go between four walls, even at home. That's why I liked Setting 02; it was surrounded entirely by glass and had a very thin structure.

Beyond its symbolic and sensory significance, participants also reflected on the capacity of *shala* and how it directly shaped their practices. P05 compared centers:

> At Setting 02, the capacity is small but being able to practice the same mindfulness practice together with the whole group is very valuable, for example, Touching the Earth. But with 45 people, we couldn't do walking meditation — the instructor said there was no suitable place for 45 people in Setting 01, so we couldn't do it. Space can affect the experience in this way, as far as I can see.

The act of moving between spaces was frequently described as a meditative experience. P04 expressed: "The path bordered by trees felt like a journey inward." The retreat operator emphasized the intentional design: "Natural trails are not just functional. They invite participants to engage with the environment mindfully, turning transitions into moments of awareness." The pathways became integral to the spatial flow of the retreat experience, P08 remarked,

> Walking to the *shala*, the act of physically going there creates a sense of separation. I think it's about sanctifying space again … Going there becomes a purpose in itself. Gathering there becomes significant. When you leave, you feel something different. The walk to the *shala* may involve a gentle incline, stairs, or a passage through nature. During this walk, I feel like I'm preparing myself for practice.

The balance between communal and solitary spaces also emerged as significant. Public spaces, such as the dining hall, fire pits, or nature, provided opportunities for shared experiences. Private areas allowed for introverted experiences. P09: "Having a private spot in my room where I could write after group meditations was invaluable. It gave me space to process the collective energy and turn inward." Another participant added that Setting 02's spaciousness and limited number of retreatants made it valuable: "Don't think of it as just escaping the chaos of the city; even there in the center, you might want to withdraw a little."

Discussion

The findings demonstrate the complex relationship between physical environments and mindfulness practices. The study also examines how the sensory and spatial features of retreat settings can either enhance or hinder retreatants' experiences. The initial themes based on Kabat-Zinn (2005): sightscape, soundscape, tastescape, smellscape, and tastescape captured the sensory experiences that directly affect retreatants' mindfulness practices. These align with Pallasmaa's (2005) and Spence's (2020) emphasis on the multisensory nature of spatial experience, as well as Altay's (2021) insights on public

interiors. As articulated by Hockey (2006), mindfulness, coupled with architectural features such as large windows, open layouts, and connection to nature, promoted "active seeing," encouraging practitioners to feel the interconnection with their surroundings. The auditory landscape also emerged as a critical factor in shaping mindfulness experiences. Aligning with Feld's (2005) understanding of sound as a "way of seizing reality," both natural sounds and artificial sounds regulated practice. This underscores the importance of carefully designing soundscapes in retreat settings, such as incorporating water features or maintaining deliberate silence. Tactile elements also played a pivotal role in anchoring practitioners to the present. As Pallasmaa (2005) states that "Natural materials – stone, brick and wood – allow the gaze to penetrate their surfaces and they enable us to become convinced of the veracity of matter." (29) Walking barefoot on gravel paths or feeling the textures of wooden meditation floors illustrated how tactile engagement fostered a sense of presence. Smells, too, accompanied the specific activities carried out; whether they were natural scents or fragrances such as incense, utilized to enhance mindfulness. Scents were also a gateway to participants' memories evoked during the retreat, highlighting the potential of smellscape to evoke the past in the present (Howes 2024; Kabat-Zinn 2005). Eating was a significant aspect where retreatants explored both their awareness of tastes and the way they shared meals with others.

Beyond these five sensory dimensions, the findings revealed two more main themes. First, participants described moments of multisensory engagement with spaces. In these moments, all senses influenced one another, as also noted by Altay (2021) in her study on public interiors. As Spence (2020) questions: Although each sense can be studied in isolation, our responses to built and natural environments are shaped by their constant interaction. Thus, the key question is how the senses work together in shaping environmental and atmospheric perception. Second, spatial interrelations, such as the position of the *shala*, the role of pathways, and the balance between communal and solitary activities, profoundly impacted the participants' practices. This finding differs from research that focuses on short durations (Altay 2021; Chen and Tang 2024; Chen, Porter, and Tang 2022) and is unique to the retreat context since it offers a moment-to-moment experience for a few days, on a larger scale. Unlike previous studies that have been limited to formal Buddhist practices and spaces (Chen and Tang 2024; Chen, Porter, and Tang 2022), this research broadens the exploration by examining both formal and informal practices. It not only examines formal settings but also explores how informal settings – such as dining, sleeping, and everyday activities – shape participants' experiences of mindfulness. Aligning with the impact of the "context" that shapes our senses, thoughts, emotions, and activities at any given moment (Feldman and Kuyken 2019), the last theme highlights the unique character of the retreat context as a space of care (Sucitto 2024).

All participants, including the first researcher, had completed the prerequisite mindfulness training. This ensured a shared familiarity with mindfulness practices, despite variations in their backgrounds and practice frequencies. Hebert (2016) suggests, there is a strong scientific link between mindfulness and sensory processing. Our investigation also supports that participants with mindfulness backgrounds perceived environmental sensory inputs more vividly and used them as anchors during practice. Similar findings were reported in a recent study on pre- and post-mindfulness training in touristic contexts, where participants, after training, demonstrated heightened

sensory awareness and richer engagement with their surroundings (Kaya, Sezerel, and Filimonau 2024).

The active role of sensory environments in shaping our everyday mindfulness is particularly evident. With specific design intentions, retreat centers can create immersive spaces that support the transformative potential of mindfulness practices. This study was conducted across two retreat centers, each having unique yet overlapping characteristics regarding their natural and built environments. In Setting 01, the use of natural stone structures contributed to a sense of closeness to nature. Another positive feature was that access to the *shala* or the dining hall did not require passing in front of the accommodations. This helped maintain a sense of privacy and quietness. In Setting 02, the *shala*'s integration with nature, through its surrounding glass surfaces, its elevated position, and its practicality were identified as key qualities. A small pool with a frog Buddha statue became a multisensory focal point: participants greeted it when entering or leaving the *shala*, and its sound was an anchor for their practice. Unlike the first center, the second center's distance from the city allowed for silence, creating an enhanced sense of presence without any distractions. This highlighted the importance of location in the retreat experience. Overall, the centers' layouts and locations, along with their sensory features, triggered different sensory experiences in retreatants' mindful actions.

Limitations and future research

Building on the insights revealed by this study, future research could further explore the application of these principles in urban or non-retreat settings, making mindfulness an ongoing process of rediscovering how we fully engage with and inhabit the spaces around us. As Spence (2020) states, the senses influence one another all the time, even when we are unaware of these cross-sensory interactions and effects. In this respect, the findings of this study reaffirm the multisensory nature of the human mind and, accordingly, the environment. Therefore, future research should prioritize multisensory demands instead of concentrating on isolated senses in built and natural environments. Lastly, all participants had prior mindfulness training, though their experience levels and frequency of practices varied; this may have influenced the findings. This constitutes a limitation for the study, highlighting the need for future research with more diverse participant backgrounds, including non-practitioners. Exploring how non-practitioners engage with the sensory and spatial aspects of retreat environments could yield comparative insights into embodied awareness. Additionally, within this study, participants were asked about sensory limitations; one participant reported experiencing light sensitivity related to cataracts. However, how individuals with different sensory abilities relate to mindful environments remains an open question, constituting a limitation of this study and an avenue for future research.

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Appendix. Interview Question Set 3 – Retreatants

(1) Age
(2) Sex
(3) Do you experience any sensory impairments or limitations?
(4) Have you been practicing mindfulness?
    (a) How long have you been practicing mindfulness?
    (b) How frequently do you practice?
    (c) Where do you most frequently practice mindfulness?
(5) Why do you prefer joining a retreat?
(6) Does the retreat center influence your decision to attend the retreat?
(7) Is it different for you to practice at home/or other location than to practice in the retreat center?
(8) In a retreat center, do you make formal or/and informal practice in your **accommodation unit**? If yes, please recall the last time that you made mindfulness practice in your accommodation unit:
    (a) What was the practice?
    (b) What were the most important interior or exterior features that supported or hindered your mindfulness practice?
(9) In a retreat center, do you make formal or/and informal practice in **dining hall**? If yes, please recall the last time that you made mindfulness practice in dining hall:
    (a) What was the practice?
    (b) What were the most important interior or exterior features that supported or hindered your mindfulness practice?
(10) In a retreat center, do you make formal or/and informal practice in **meditation hall**? If yes, please recall the last time that you made mindfulness practice in meditation hall:
    (a) What was the practice?
    (b) What were the most important interior or exterior features that supported or hindered your mindfulness practice?
(11) In a retreat center, do you make formal or/and informal practice in **nature**? If yes, please recall the last time that you made mindfulness practice in nature:
    (a) What was the practice?
    (b) How did nature support your mindfulness practice?
(12) Any complementary questions based on the interview.