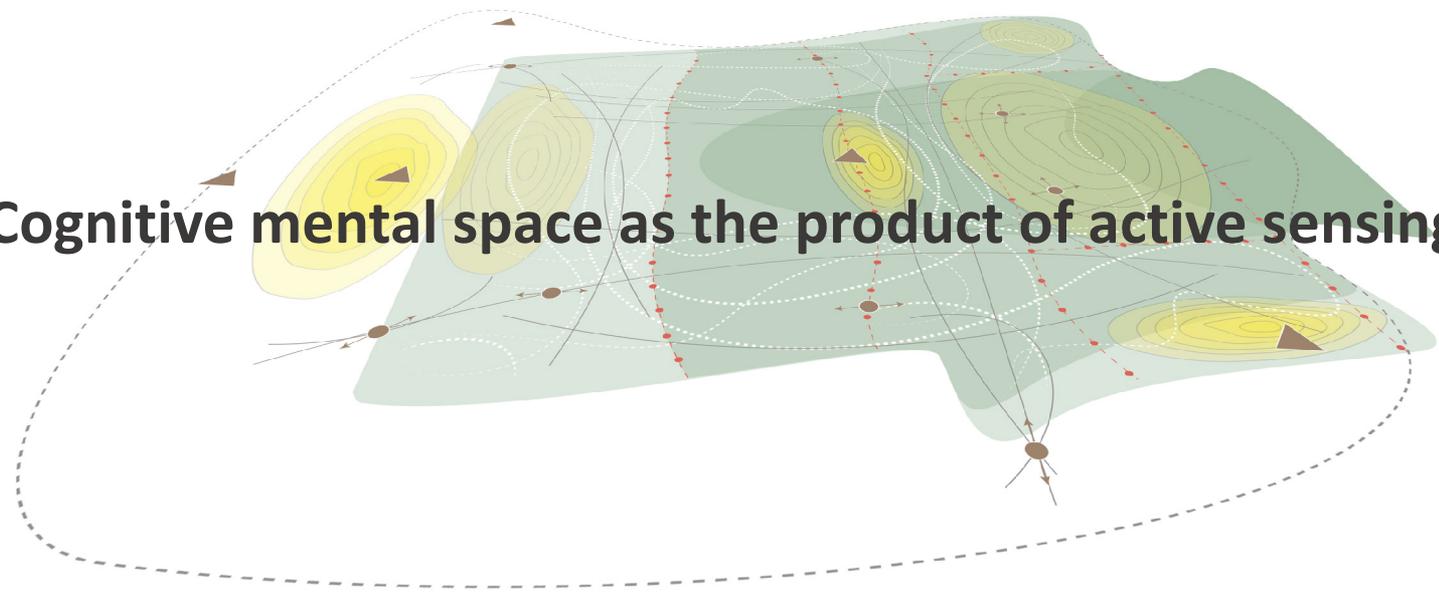
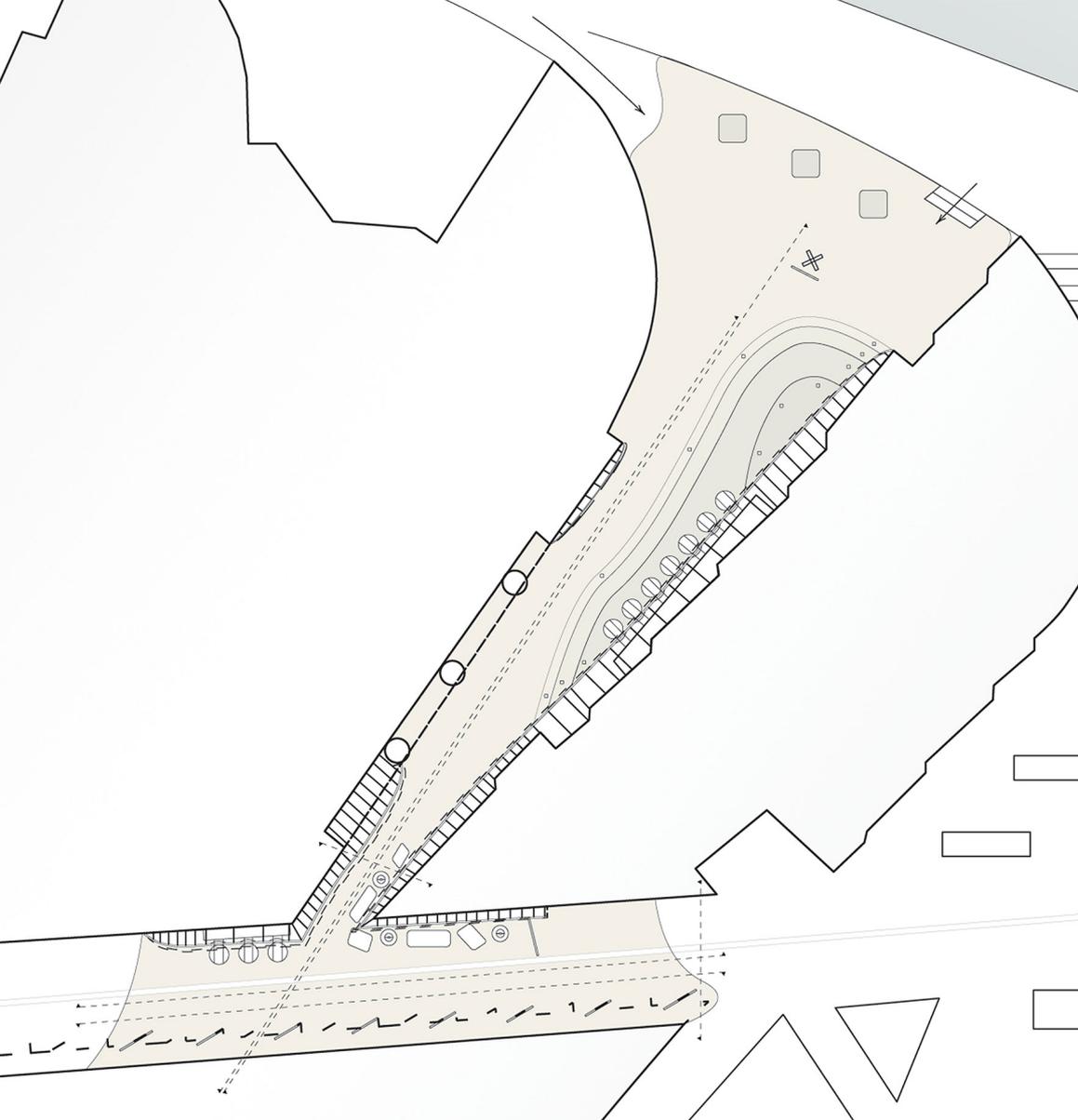




Cognitive mental space as the product of active sensing





We tend to think of buildings as permanent structures with more or less static properties. In spatial representation, the diagram of the floor plan shows space as a void encased in solid or porous boundaries. In the real world, the body of architecture and the solidity of materials generate a sense of stability, or even finality. This is one way of thinking about space.

Another way is to embrace the notion of living in the state of impermanence rather than one of finality. This concept is expressed by philosopher Gaston Bachelard (1958) and this research moves away from a static spatial model towards a dynamic environmental one that centres on sensing.



The dynamic spatial model doesn't refer directly to the physicality of space but to what phenomenologists such as Maurice Merleau-Ponty (1945) refer to as the lived space of embodied experiences. Mark Johnson (2007) explains this further: 'meaning is grounded in bodily experiences [...] Bodily experiences occur through sensing and through sensing we become conscious of qualities, information and patterns in our environment.'

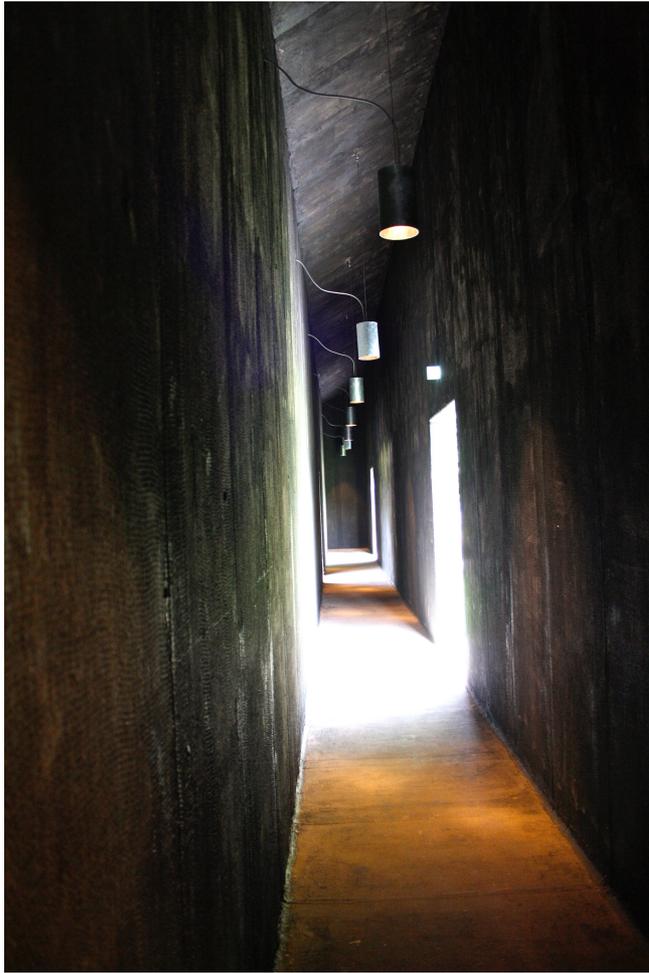
We perceive our environment through our senses but we are not simply passive recipients. Our senses actively seek information in our surroundings. The reference of senses as active seeking mechanisms comes from ecological psychology and the work of James J. Gibson (1966).



The ecological perspective indicates that our experience of spaces is relational. Gibson explains that the environment '[...] does not exist in or of itself. It exists only in *relation* to the being whose environment it is.' This means that the meaningful environment of the lived space is relative to each of us as the subject of perception. Even though the location and design of a space, activities within it and the culture in which it exists will foster shared experiences, each of us will have a unique experience.

Gibson (1986) also reminds us that we are sentient and animate, we are 'perceivers *of* the environment as well as behaviors *in* the environment'. We don't exist independently from one another. The behaviour of one person will have an impact on the perception of another and Henri Lefebvre (1974) explains that we situate ourselves in space as active participants: 'the search for information about things through skin contact, through feeling, through caresses, relies on the use of subtle energies.' Through participation, through movement, gestures and activities, we also generate sensory space.

Therefore, we can conclude that we develop our knowledge of the world through active sensing and that active sensing is exploratory, participatory and generative.



Sensory space is not one homogeneous entity. As we move through space and our senses actively seek information, the information filters into consciousness and gradually we perceive space as a series of arrivals into and departures from nested sensory territories, an experience mediated by perceptual thresholds.

Perceptual thresholds are transitions into sensory environments. Sometimes they're mediated by physical elements in space such as doorways, or they belong to the domain of surfaceless space, a term coined by phenomenologist Hermann Schmitz (2011). Perceptual thresholds in surfaceless space include the transition from light to dark or noisy to quiet.

When our senses actively seek information we form mental impressions. Malnar and Vodvarka (2004) explain that we do not respond directly to our real environment but to mental impressions of it and in perceptual psychology, Rudolf Arnheim (1983 cited in Malnar and Vodvarka 1992) explains that as we pass through a space, we pick up information through a myriad of mental impressions, which we integrate together automatically to form a total perceptual image. It is from this total perceptual image that we develop a mental map of our environment.



Cognition is defined as the mental action or process of acquiring knowledge and understanding through thought, experience and the senses. Therefore the notion of impressions is important because it denotes that a small detail is enough for cognition to occur.

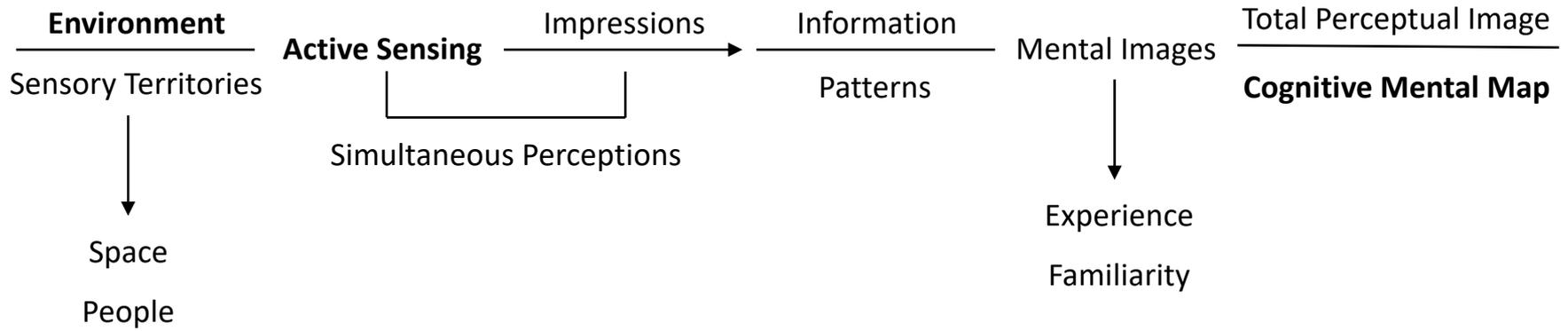
According to psychologists Stephen and Rachel Kaplan (1981) environmental cognition develops through experience and familiarity and that we also look for traces of familiarity in less familiar environments. They explain that familiarity with an environment is essential information about that environment already stored in the head and as familiarity develops we become less dependent on information from the environment.



Our mental map is the product of patterns of stored information generated through active sensing. Malnar and Vodvarka (2004) explain that this process is highly complex and involves all senses as well as locational accuracy. In Western culture, we often privilege vision but other senses, the ability to understand our surroundings through touch, smell or sound also play a critical role in the development of environmental cognition.

Placemaking writer Tony His (1990) talks about 'simultaneous perception', '[...] a general awareness of a great many different things at once: sight, sounds, smells, and the sensation of touch and balance, as well as thoughts and feelings [...] we develop mental images through cross-sensory, or multi-sensory, patterns of information, not only about the physical environment but also about relations between people.' Therefore, simultaneous perception is the ability to perceive many sensory impressions at the same time to form mental images. `

Cognitive mental space as the product of active sensing

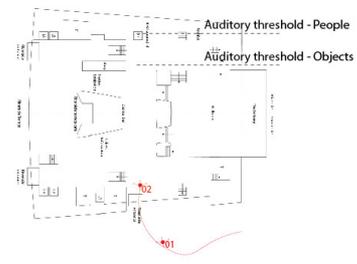
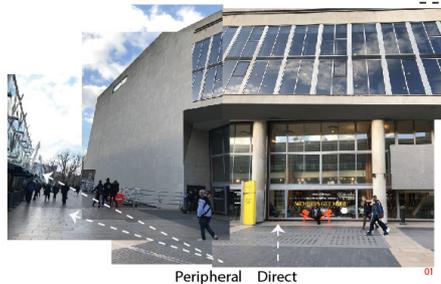


Active Sensing

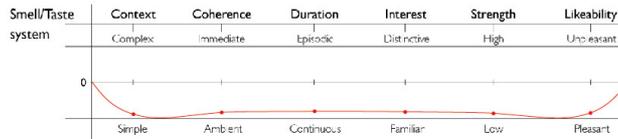
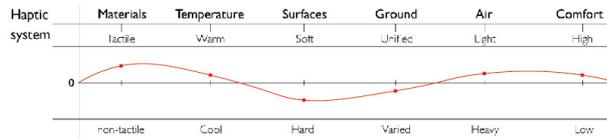
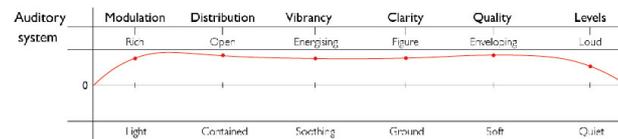
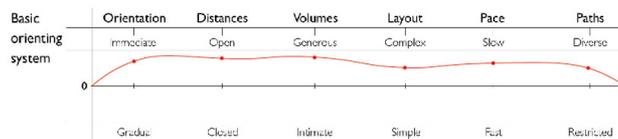
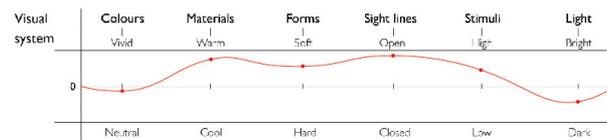
Simultaneous perceptions



Perceptual Thresholds



Sensory Flow



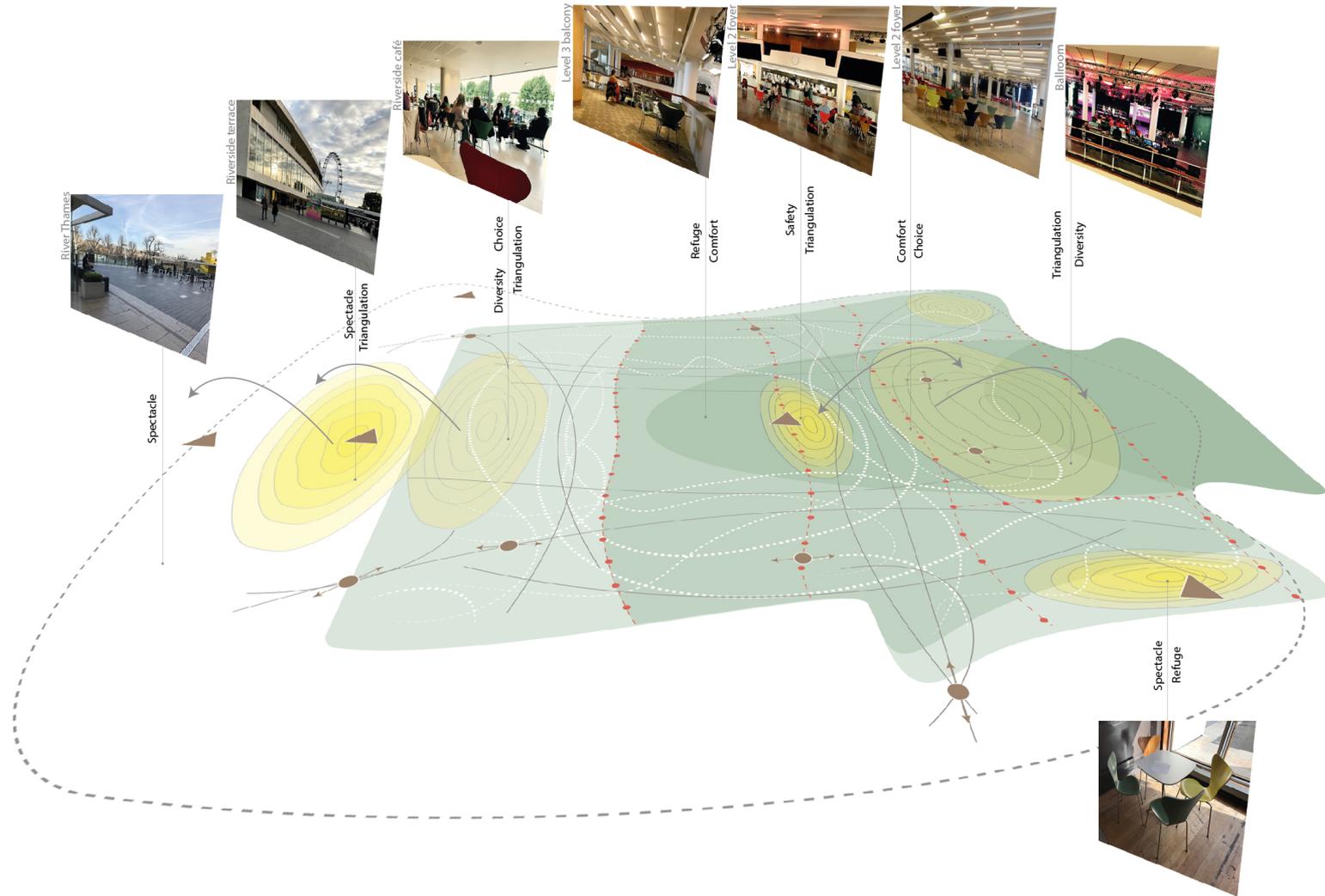
Interpretation of Gibson's (1966) perceptual systems classification table:
(Malnar and Vodvarka 2004)

- **Visual system** - stimuli: light; information through: surfaces and forms
- **Smell-taste system** – stimuli: air; information through: odour and flavour
- **Auditory system** – stimuli: vibrations in the air; information through: sound
- **Basic-orienting system** – stimuli: gravitation towards and kinaesthesia; information through: movement
- **Haptic system** – stimuli: skin; information through: touch

Cognitive Mental Map functional properties (Kaplan 1981)

- **Generality:** the model extracts similarities and ignores temporary situations and variations in environmental configurations.
- **Economy:** the model simplifies and codes the information for speedy and reliable access.
- **Connectedness:** the model uses a series of symbols to identify known points and establish connections for the map to read as continuous.

- **Simplicity:** unnecessary information is discarded.
- **Essence:** critical stereotypical information is retained.
- **Directness:** experiences are arranged into categories.
- **Unity:** a clear organisation of information against its background.



Royal Festival Hall
Level 2

Cognitive
Mental Map

Active
Sensing

Subject of perception:
Valerie Mace

KEYS



Flows



Perceptual
boundaries



Perceptual
threshold



Sensory
territory



Sensemark



Perceptual
nodes



Interiority



Focal

Prototype map to illustrates my cognitive mental map of level 2 at the Royal Festival Hall.



Active sensing is something we do everyday, it is a natural process that enables us to make sense of our environment. We actively seek information through sensory impressions but we also participate and may even leave our own sensory impressions behind, as this image illustrates: an in-between departures and arrivals.

Active sensing is complex and dynamic and difficult to grasp in its totality. Yet this research shows that it is possible to develop a phenomenological methodology that facilitates the documentation and interpretation of sensory impressions, and to translate them into a mental map that illustrates how a space resonates with our senses.

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