Chapter 8

The Doors of Dynamic Thermal Perception: Towards Environmental Quality in Urban Design

Carolina Vasilikou
University of Reading, UK

ABSTRACT

The thermal experience of people moving in urban spaces in everyday life is characterised by multiple qualities and perceptions. This seamless transition from one perception to another in itself creates a multisensory network of dynamic thermal boundaries, which could act as assessment mechanism in the way we perceive quality of urban space and urban design. Using a hybrid methodology of situated interactions between thermal perception, microclimate, and urban morphology, this chapter builds a simulated narrative of the everyday, perceptions, and ‘haptics’ of moving in urban spaces, taking into account both physical and non-physical spaces, exploring the sensory potential and thermal dimension of urban wandering. This approach contributes to understanding the link between environmental quality in urban spaces and urban microclimate, proposing a series of design tools for multisensory assessment with thermal perception as a starting point for the creation of high-quality city spaces.

INTRODUCTION

Walking in the city affects the sensory realm of the pedestrian. It also forms an activity that allows the pace to evaluate and assess environmental quality of outdoor spaces. This holds great benefits for urban design practices and the creation of climate-sensitive places. Indeed, streets and squares in spatial sequences form a complex environment that enriches the thermal experience of pedestrians in movement. The variations that the latter perceive are not only spatial, but also microclimatic. The impact of microclimatic variations on thermal perception is difficult to measure. In particular, the link between the complexity of spatial sequences, the act of walking and the perception of thermal comfort in dense urban environments has not been studied sufficiently.

DOI: 10.4018/978-1-5225-3637-6.ch008
This chapter presents a new design tool that helps to fill this gap. This methodology starts from the process of ‘thermal walks’ (Vasilikou, 2015). These consist of a sense-walking technique (Henshaw et al., 2009) that analyses the urban climate, the morphology of spaces and the way people perceive their combined effect, through a series of structured walks with simultaneous environmental and human monitoring. This new process is based on point-to-point evaluation of the thermal perception and spatial variation. Its particularity is the combination of objective microclimatic and spatial data with subjective responses by pedestrians at street level.

The methodology of thermal walks has been tested on site during fieldwork in the historic core of Rome and London during 2012 and 2013 (Figures 1 and 2). This made it possible to compare results obtained from two spatial sequences in different climates in the temperate zone. Microclimatic mapping and design of a questionnaire for thermal walks (Vasilikou, 2015) helped to document the microclimate and variations in its perception. The resulting data was interpreted with statistical analysis and complex graphic representations of thermal variation in each spatial sequence. Findings reveal the role of streets and squares as spatial systems of thermal diversity, and shed light on some unknown characteristics of two of the most successful pedestrian routes in Europe. The understanding of the thermal implications of spatial diversity is essential to develop site-specific design guidelines towards an evidence-based practice of sensory urbanism towards environmental quality for people walking.

**BACKGROUND**

The model of thermal equilibrium has been used for a long time in order to predict the conditions of thermal comfort. However, according to Brager & de Dear (1998) human comfort may be influenced by various complex factors that are not often taken into account in the models based on the thermal