

***Living*scape Approach to Improve Urban Historical Places**

Francesca La Malva , Arianna Astolfi, Pasquale Bottalico, Valerio R.M. Lo Verso and Fabrizio Bronuzzi

TEBE Research Group, Politecnico di Torino, Department of Energetics Corso Duca degli Abruzzi 24, 10125 Torino, ITALY

This work presents a study on "urban quality" as an important support to urban planning and management which was carried out through the *living*scape approach (urban blight, soundscape, light-scape, thermal-scape, questionnaires) within the historic district „San Salvario“ in Turin. To account for the multidimensional character of the urban quality in towns, an integrated analysis of three aspects was addressed, involving: 1) psychometric tools to measure the perception of environmental quality; 2) different aspects related to the urban blight (both in architectural and environmental terms); 3) objective investigation of environmental quality through the measurement of acoustic, visual, thermal and IAQ physical parameters. In particular, the paper focuses on the correlations among environmental perception subjective data and urban blight factors. Subjective and objective data were collected in-the-field during summer 2010 and winter 2011 every 30 m along 13 key-spaces of the district. The urban blight“s survey was filled by some experts, while the environmental perception was delineated through the analysis of 496 questionnaires (240 in summer and 256 in winter), submitted to the users of the area during the measurements.

An overview of the procedure and of some results which were found is presented.

1. INTRODUCTION

There is an increasing public interest in the quality of open urban spaces as it is acknowledged that they can contribute to the overall quality of life within towns [1]. This is related to physical aspects such as microclimate, thermal, visual and acoustic comfort, urban morphology etc. as well as to the anthropological and social environment. In this study, the „urban quality“ was evaluated through an approach called *living*scape, which is the integration of urban blight, soundscape, light-scape, thermal-scape, air-scape and subjective replies of users. For this kind of analyses, onsite surveys and measurement campaigns represent the most appropriate tools, given the difficulties in simulating the complex interactions between environmental aspects and social/cultural factors.

This paper describes only a part of the work: the correlations between environmental perception subjective data and urban blight factors, detected during summer 2010 and winter 2011. The representation of the subjective results on urban maps allows to detect the key-spaces that need to improve some of the environmental quality aspects.

2. METHODS

From a previous study carried out by the authors on a number of different historic sources [2] (archival, cartographic, literary and documentary) from the 19th century onwards, it was possible to understand variations in the human dimension of perception (sight, sound, smell and microclimate) in Turin, with particular attention to the district of San Salvario.

From this analysis, 13 key-spaces (10 streets, 2 squares and an arcade) were selected as meaningful to characterize past and present district soundscape (Fig. 1). These were divided in nodes, paths and edges based on Lynch's the mental mapping approach [3]. The key-spaces were further subdivided into 30 m long parts [4]: for every part, urban blight evaluations, environmental measurements and user judgements through questionnaires (soundscape, light-scape, thermal-scape) were carried out to investigate the *livingscape* [5]. The field campaigns were conducted for three days in September 2010 and February 2011, from 10 am to 2 pm for daytime conditions and from 8 pm to 2 am for nighttime conditions.

The urban blight evaluation, aimed at detecting the factors that affect the environmental quality in the key-spaces, was carried out by two expert operators by using a dedicated survey during the summer daytime. They assessed the urban space for each measurement point of the key-spaces through a 5-point scale (1: *unpleasant*; 5: *extremely pleasant*) in the meantime recording significant urban elements (as architectural aspects, urban sounds). The survey consisted of 46 items to analyse aspects concerned with livability and quality of life, architectural and urban features, social life, physical environment, safety, activities and utilities, place identification and site arrangement. The items were selected focusing on the Italian laws and regional rules on "*Urban livability, quality of life and urban blight*", and with particular attention on Tuscany rule in this regard.

On the other hand, environmental perception was delineated through the analysis of the questionnaires submitted to the users of the area. Following a methodology based on specific literature [6],

a questionnaire was specifically prepared to identify the frequentation and behavioral patterns of users and how they perceive the environmental aspects. It consisted of 51 items, divided in two sections, one regarding general background information (gender, age and number of years spent in urban areas etc.), frequentation and identity of the place, quality of life in the district and one aimed at collecting judgments on environmental perceptions (acoustic, light, thermal and air quality) and pleasantness, calmness/relaxation, vibrancy [7]. Both a 5 and 10-step rating scale (with a semantic descriptor for each step) and continuous scales, with semantic descriptors placed at the extremes, were used for the subjective investigation. A total of 496 questionnaires was filled in. The district is characterized by a multiethnic population, mainly female and young, with quite diversified professions. San Salvario mainly serves as an important place to stroll around and meet other people and is frequented regularly. The daytime is characterized by different urban activities, in particular by commercial services; however some parts of the district are nodes where young people attend pubs and restaurants.

3. RESULTS

All statistical analyses were carried out by using the SPSS® package. A factorial analysis on urban blight answers allowed to single out 13 factors explaining the 75.7% of the variance: 1. Architectural and urban features (11 items); 2. Security (5); 3. Social services (2); 4. Maintenance and care (4); 5. Transports (2); 6. Practiced space (3); 7. Psychological state features (3); 8. Commercial services (4); 9. Affection for the district and urban identity (4); 10. Urban cleanliness (2); 11. Cultural background (2); 12. Education and behavior (2); 13. Decoration (1).

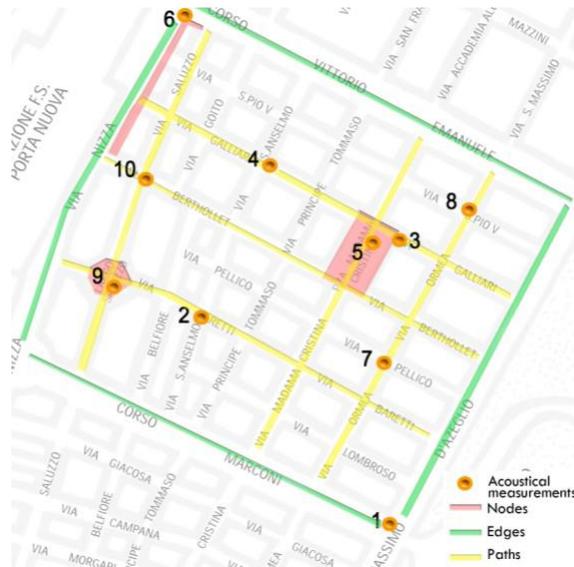


Figure 1. Key-spaces and acoustical measurement points visualized on the map of San Salvario.

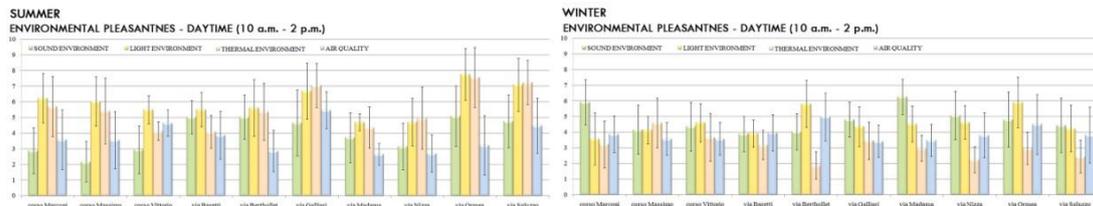


Figure 2. Mean values and uncertainty of the means of the subjective scores concerning sound, light, thermal environment and air quality pleasantness in the different key-spaces collected during summer and winter daytime.

In the following, some of the results which were found on the relationship between environmental perception subjective data and urban blight factors are presented.

Figure 2 shows the subjective scores relative to sound, light, thermal environment and air quality pleasantness (the mean values and the relative uncertainty are displayed for each street). Scores were expressed on a continuous scale (ranging from 1 = “unpleasant” to 10 = “extremely pleasant”): the highest rates were observed for light and thermal pleasantness in summer and for light and sound pleasantness in winter (both during day).

Figure 3 is based on the two independent dimensions

“calmness/relaxation” and “vibrancy” and shows for daytime the *perceived* and the *preferred* scores – based on continuous scales - for each point where more than three interviews were collected. The *perceived* soundscape is mainly associated to the attributes “agitated, stressed, etc.” related to Calmness and “gloomy, bored, etc.” related to Vibrancy with negative scores in summer and central evaluation in winter, while the *perceived light-scape* refers to “calm, peaceful, etc.” related to Calmness and “fun, excited, etc.” related to Vibrancy. All the *preferred* scores about both soundscape and light-scape tend to move towards a major Calmness and Vibrancy, relating to “calm, peaceful, etc.” and “fun, excited, etc.” urban spaces.

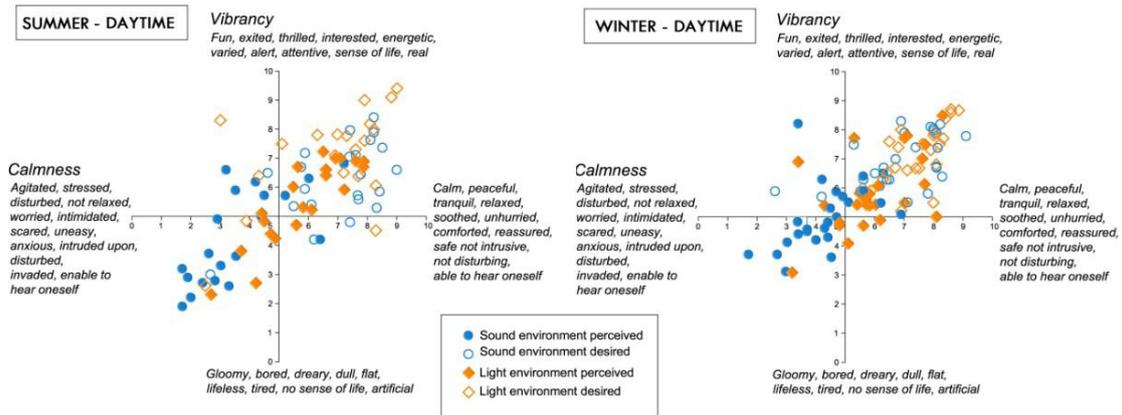


Figure 3. Perceived and preferred scores for the two independent dimensions “calmness/ relaxation” and “vibrancy”, during summer and winter daytime.

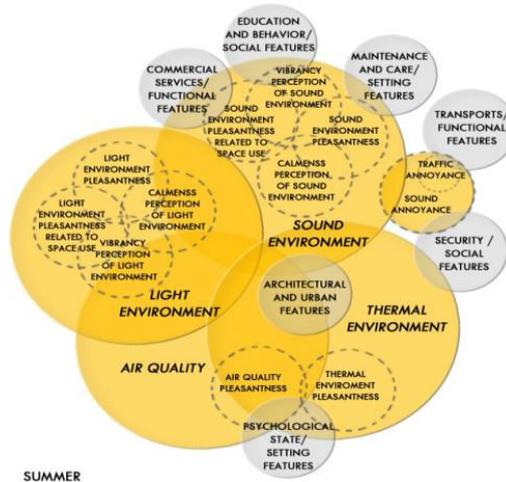


Fig. 4. Correlation between the 13 urban blight factors and the subjective items for the environmental perception and pleasantness during daytime in summer.

Figure 4 shows the most significant correlation (p -values <0.01) between the 13 urban blight factors and the subjective items related to environmental perception and pleasantness during the daytime in summer. All the four environmental factors result, in summer, strongly correlated while some of the factors related to the urban blight are mainly correlated with the sound environment and partially with the thermal environment and the air quality; while in winter only light and thermal-scape are not related to each other. Apart from some obvious correlations (“traffic annoyance” and “transport”) sound and thermal environment and air quality result correlated

with the factor no.1 representing “architectural and urban features” in summer; while surprisingly “light-scape” is correlated with the factor n. 10 “urban cleanliness” in winter.

4. CONCLUSIONS

This paper analyses the *livingscape* (urban blight, soundscape, light-scape, thermal-scape, questionnaires) in an urban open public space based field surveys and measurements in Summer 2010 and Winter 2011 on 13 key-spaces which characterize past and present soundscape of the district, subdivided in nodes, paths and edges.

Thirteen factors were singled out from

the factorial analysis on urban blight survey based on 46 items. Some of the urban blight factor scores are correlated with the sound environment scores and partially with the thermal environment and the air quality scores.

For both the sound and light environment a general correlation between calmness and the vibrancy was found, even if a differentiation among key-spaces and period of the day is detected and represented on urban maps. A general trend on preferring a major calmness and vibrancy was observed both for the light-scape and soundscape for daytime. This is also confirmed by the subjective scores on perceived environmental pleasantness.

The correlation with the objective environmental measurement scores will allow to detect the key-spaces that need to improve some of the environmental quality aspects.

5. REFERENCES

[1] Zhang M., Kang. J., *Acoustic comfort evaluation in urban open public spaces*, Applied Acoustics, 66 (2005), pp. 211-229.
[2] La Malva F., Astolfi A.: *The role of Public Health and Safety Regulations in Turin's urban development: soundscape*

approach and urban form, in Proc. "1st EAA – EuroRegio Congress on sound and vibration", Ljubljana, September 15-18, 2010, 192.

[3] Lynch K., *The Image of the City*, MIT Press, Cambridge, 1960.

[4] Di Gabriele M., Maffei L., Aletta F., *Urban Noise Mapping Based on Emotional Dimensions*, in Proc. "1st EAA – EuroRegio Congress on sound and vibration", Ljubljana, September 15-18, 2010, 75.

[5] La Malva F., Astolfi A., Lo Verso V.R.M., Bottalico P., *City's quality of life based on livingscape approach (urban blight, soundscape, light-scape, thermic-scape, subjective replies of users) to improve an urban historical place*, in Proc. Forum Acusticum 2011, Aalborg, June 26 – July 1, 2011, 314.

[6] ISO/TS 15666, *Acoustics — Assessment of noise annoyance by means of social and socio-acoustic surveys*, International Organization for Standardization, Genève, 2003.

[7] Cain R., Jennings P., Poxon J., Scott A., *Setting targets for soundscape design: The practical use of a 2-dimensional perceptual space*, in Proceeding of Internoise 2010, Lisbon, June 2010.