Middle/Small Sized Cities and Open Spaces. Technological-Environmental Design Synergies

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Abstract: The paper presents some of the results of research carried out by the authors on the unbuilt spaces of small and medium-sized towns, which are characterised by demographic and economic fragility, as well as by critical issues caused by climatic, cultural, geomorphological and social changes. Among the transformative tendencies often underway in open urban spaces are either top-down, excessively generalist/standardised interventions, or bottom-up, exclusively specialised/customised actions. Thus, the need for a synergy between universal and user-centred vision emerges, which allows us to rethink the unbuilt space of the city in an integrated way, as a regulatory-enabling interface. A regulatory-enabling interface is a system of spaces able to bring the challenges of urban sustainability within a wider relational and connective declination between resources, spaces, inhabitants, cultures and forms of local production. This challenge appears to be particularly feasible in small and medium-sized cities, due to the small size of the settlements, the permanence of long-lasting relationships between collective space, individuals and society, and the socio-cultural conditions that favour adaptation processes.

Key words: Technological-environmental design, user centred vision, universal centred vision, urban redesign, regulating-enabling space.

1. Introduction

Despite global evidence of a tendential concentration of the population in big cities [1], the situation in Europe presents diverse conditions. An important percentage of people continues to prefer living in medium and small cities. In 2014, some 27.8% of the population lives in scarcely inhabited rural areas and 32% in medium/small cities, versus 40.2% in big cities [2]. These percentages appear to find confirmation in medium to small European settlements in the Adriatic-Ionian-Balkan area. Figures provided by the 2017 Eurostat survey present average values of demographic concentration of 27.3% in rural areas and 31% in medium-small cities, compared to 41,7% in big cities.

All the same, in the wake of the "Great Recession" of 2008, even the medium and small cities of the Adriatic-Ionian-Balkan area continue to suffer the negative effects of depopulation and a weakening of economic-manufacturing structures. Other critical elements are induced by climate, geomorphological, cultural and social change. Extreme weather events are on the rise in Europe (also including Adriatic-Ionian-Balkan area), with negative economic repercussions caused by flooding and hydrological events (43%), storms (34%), heat waves (14%), drought and other climatic events (9%) [3]. The same areas also face rising risks of forest fires. According to the analyses of the World Health Organization, climate change is causing a rise in the mortality rate. Last but not least, the Adriatic-Ionian-Balkan areas (Italy, the Balkans, Greece) are also exposed to seismic risk [3] and traversed by flows of migrants arriving from Africa and the Middle East. Despite these worrisome indicators, Europe offers a higher perceived quality of life in areas with medium to low

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densities of urbanisation. This situation characterises above all those settlements with many open spaces dedicated to collective, cultural and leisure activities.

On a scale of 1 to 10, and with an average European value of 6.9, the highest levels of satisfaction in the Adriatic-Ionian-Balkan area are recorded in Slovenia (7.7) and Croatia (6.9); lower values, instead, are registered in such areas as Malta (6.4), Italy (6.1), Serbia (5.9) and Greece (5.0) [4].

In this direction, particular strategic importance is assumed by the system of unbuilt spaces in medium and small cities. In fact, it can be argued that their unbuilt spaces continue to possess essential elements for recomposing broken links among people, the built environment, public spaces, flows of resources/information and natural, cultural and climatic components. These elements can be said to include: the contained scale of the population, between 2,000 and 30,000/50,000 inhabitants; permanent traces of the past that represent a legacy of intercultural dialogue [5]; the persistence of material connections and immaterial relations among people, open space and environment [6, 7].

This theme reveals three perspectives of synergic technological-environmental intervention to contribute to redefining open spaces as generating systems of interactions to improve the quality of life in medium and small cities: synergies between user centred and universal visions; synergies between densification and thinning; synergies between regulation and enabling.

2. Synergies between User Centred and Universal Design Vision

Medium and small cities are generally characterised by a fragile stability and show a greater vulnerability toward pressures induced by external socioeconomic-environmental modifications [8].

The relationship between open space and external variables, natural and/or artificial, reveals an initial perspective of technological-environmental intervention that can take on two main aspects (Fig. 1).
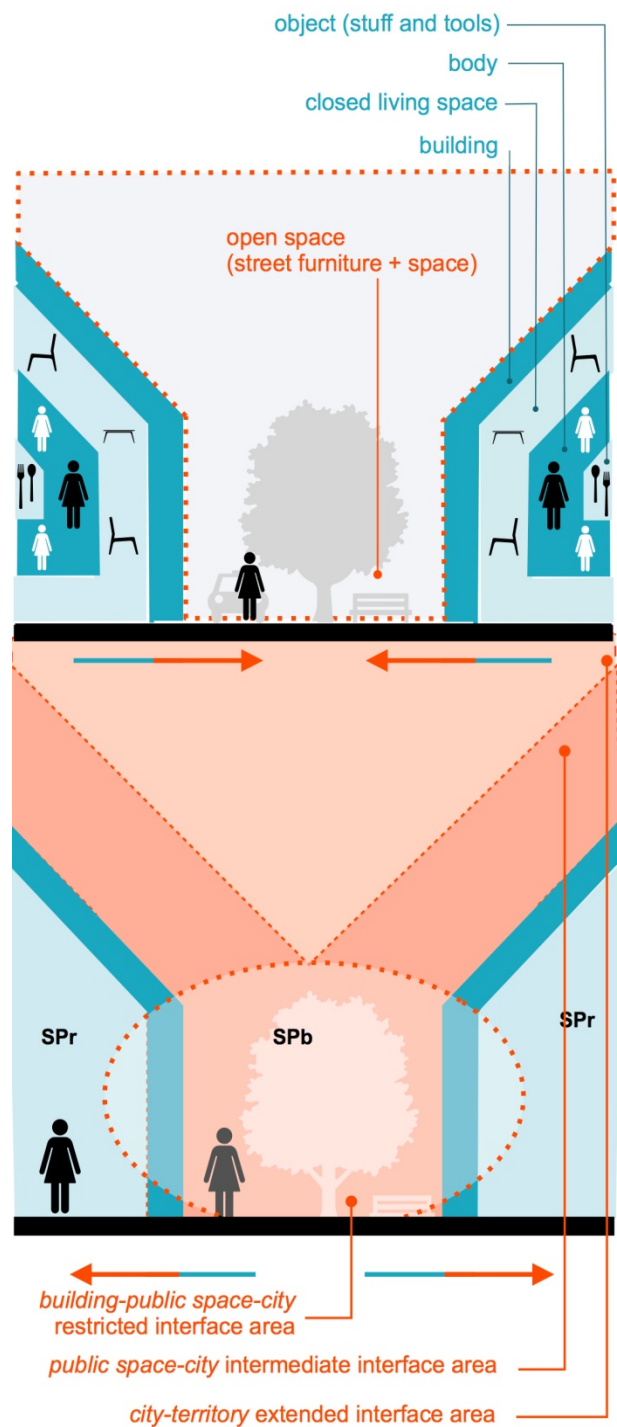

Fig. 1   Characteristics of user-centred vision and universal centred vision in relation to the open urban space.

The first aspect concerns the capacity to improve interactions between people and the external environment, that is, between the wellbeing of users, spaces, components and facilities in urban space.

According to the *user design vision*, the "urban dimension" affects not only the usability and quality of the conformative-dimensional relationship (accessible, inclusive space), but also the capacity for space to be "experiential reality" (psycho-physical-metabolic relation) and "prosthetic space" able to stimulate determinant activities (anthropocentric relations).

The second aspect regards the *universal design vision*. Open space is not considered a container of performance, but a vector of wellbeing. Hence, an interface that relates universal/environmental values and variables with the capacities/specificities of people, to approve accessibility and fruition for weaker users, favour the compresence and coexistence among diverse users and regenerate settlements through shared actions of caring and maintaining.

User and *universal centred* approaches have often led to the emergence of specialisations (*Environmental-Friendly Design*, *Barrier-Free Design*) with consequent "exclusive" forms of design [9, 10], limitations on rights to the city, a drop in levels of urban comfort and safety, not to mention an amplification of micro-*gentrification* [11]. All the same, in the case of medium and small cities, an initial technological-environmental challenge consists precisely in overcoming the opposition between a *user centred* and a *universal design vision*. The metric relations between the urban dimension and human scale, and relations of proximity between socio-environmental components, make these settlements more suitable for triggering processes of adaptation to external variables, developing *user/universal based* interventions to synchronically improve sustainability, liveability and wellbeing in medium and small cities by operating along three perspectives for innovation.

The first perspective regards reaffirming the right to public space, to wellbeing in the city, to the availability of resources, to social inclusion [12].

Beginning with improvements to accessibility for specific needs, we can extend advantages to diverse users' targets and re-establish convivial connections in the open spaces of the city.

A second perspective brings the quality of urban space and its facilities back into play with respect to the capacity to enable and/or disable people's functional performance. In this direction design can work to improve/increase the functionality of users, to favour physical activity through the wealth and a variety of visual and perceptive stimuli.

The third perspective regards the development of a new sense of community through participatory processes in which unbuilt space becomes the site of co-creative and collaborative actions. Solutions for interventions move beyond the mere technical definition of facilities, to reimagine space in its capacity to reactivate supply chains for the production-consumption of local products and promote new forms of ecological use of the territory.

3. Synergies between Densification and Thinning

The challenges of sustainability have recentred strategies of *governance* for urban areas on the paradigm of densification (buildings, demographics, functions), recognised as a necessary horizon for confronting the unsustainable aspects of unlimited urban growth [13, 14]. Even small and medium cities have witnessed the beginning of processes of redensification. The causes, in part ascribable to the field of similar objectives in larger urban areas, can also be traced back to the economic and demographic contraction seen in medium and small cities. Redensification is induced by the re-compacting of smaller urban areas. However, this may also compromise those still-functioning unbuilt spaces that continue to constitute the principal generative resources of dwelling quality. A drop in quality could come in the wake of an excessive contraction in a number of inhabitants, tourists, flows, automobiles,

infrastructural works. The hypothesis of synergic *user/universal based* design of unbuilt spaces also fully belongs to the field of challenges represented by the urban sustainability of medium and small cities. In these situations, it is precisely the presence and human scale of still vital and functional unbuilt spaces that permits design to achieve multiple objectives: maintaining active connections between actions of conservation and transformation; preserving the continuity of a "sense of place"; re-actualising the resources of the past as conditions of comfort and liveability in alternative to big cities [15]; redirecting ties with nature and the territory toward more sustainable urban innovations [16]; nurturing the "return" of inhabitants by re-establishing lasting relations with the environment [17] (Fig. 2).

What emerges is a twofold perspective of intervention able to forecast densifications, as well as the maintenance of works of thinning.

The first perspective regards overcoming the tecno-centric principle of the *smartness* of small and medium cities. The "intelligence" of these settlements does not come from the quantitative densification of enabling technological solutions, nor from *user centred* ultra-specialisation, nor even from the conservative emphasis of pre-industrial local models of dwelling. The *smartness* of small and medium cities can be supported through the capacity to maintain the vitality of public and collective spaces as infrastructures that generate reactivity, inclusion and vitality.

The second perspective concerns the reconstruction of conditions of *healthiness* in small and medium cities, overcoming the idea of settlements destined exclusively for the elderly. The healthiness and attractiveness of small and medium cities can be regenerated by working with the system of unbuilt spaces, avoiding the excessive standardisation of a *universal centred* approach and re-linking connections with natural resources, food, culture and local products, in a restorative vision of collective dwelling,
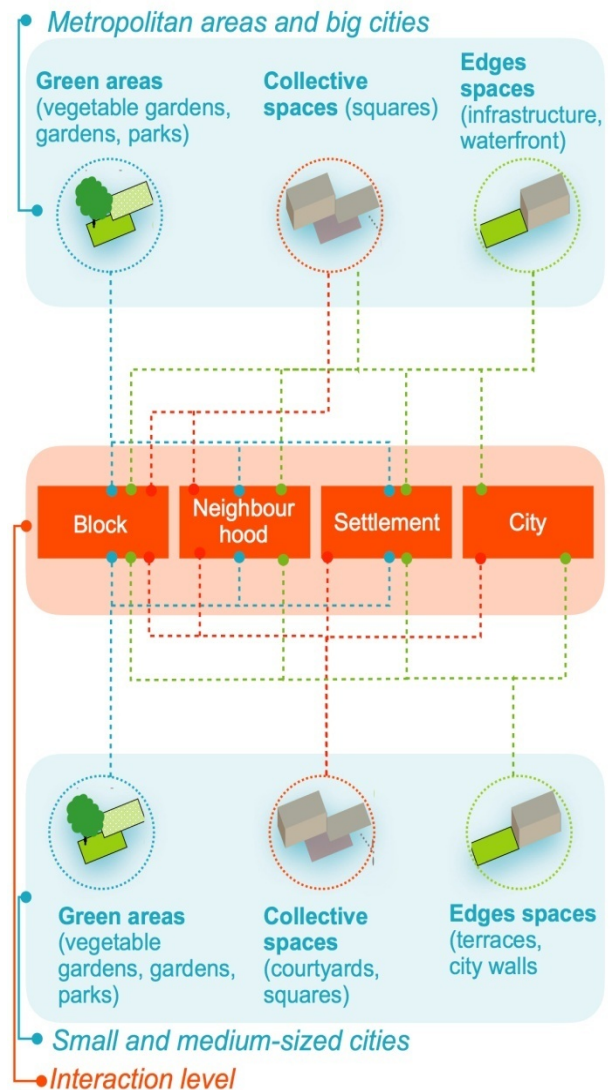

Fig. 2   Comparison between levels of interaction of non-built spaces in big, small and medium-sized cities.

attentive toward physical, relational and symbolic characters [18]. The framework of intervention delineated in this manner can contribute to regenerating medium and small cities as *healthy* and *smart medium/small* towns [19]. In these medium-small settlements, interactions among people, the built environment, urban settings, sounds, noises, atmospheres, scents, traditions, light, air, water and energy can therefore contribute to characterising unbuilt space as a technological-environmental system that actively works to develop the enabling capacity of inhabitants.

4. Regulating and Enabling Synergies

Convergences between a *user centred vision* and a *universal centred vision* must consider more than the parallel application of two diverse approaches to the design of unbuilt space. Processes of urban concentration/re-densification, and the phenomena often consequent to compartmentalisation and exclusion, begin to place the founding principles of the collective and social functioning of any city in crisis. Functional *mixité* and civil coexistence are unable to find suitable space in the unbuilt spaces of the city. Even in medium and small cities, excessive semiotic, demographic and technical congestion, and the conflictual situations it causes, could compromise unbuilt spaces by circumscribing the concept of wellbeing to internal and private spaces. Homologating, specific or exclusive solutions are insufficient for resolving the conflicts that undermine the functioning and meaning of urban space.

The more limited dimensions of settlement in medium and small cities can favour the redesign of unbuilt space by establishing a convergence between elements of strategic planning and operative-implementational activities. The sustainability of *small/medium towns* can take on a more effective meaning by redefining unbuilt space as a system with the ability to assume both enabling capacities (bottom-up/local toward top-down/global) and regulating capacities (top-down/universal toward bottom-up/specialised).

This biunivocal point of view presupposes a reconsideration of unbuilt space in terms of a sustainable and synergic development between *smartness* and *healthiness*. It operates in three fields of interaction: the physical environment that affects the activities of people; the relational environment of uses that improve/worsen the health of inhabitants; the socioeconomic environment, referred to conditions of attractiveness and liveability, with respect to contextual factors.

This method of intervention delineates two integrated perspectives of work.

In the first, the unbuilt urban system is configured as an "urban room" with enabling functions, in which to pass from the specialist-metric to a global psycho-physical vision, establishing relations (among inhabitants, buildings, facilities, non-residents) that move from the interior toward the exterior [20, 21]. These relations assume significances that are conformative-dimensional (quality of space and degree of physical-corporeal usability) as well as cognitive-sensory (quality of stimuli emitted by space and coherence with the physiological capacities of people) [22]. Acting on variables that can be internal (modulators of bio-psycho-sensory spheres) and external (behavioural modulators), the permanence of the contiguity between private/collective space in medium and small cities can favour conditions of sustainability, protection and wellbeing in the anthropic-dimensional/psycho-physical and anthropic-dynamic/social environment.

With the second perspective, the unbuilt is configured as a space of regulatory interface in which to recover or reinforce relations among environmental-contextual factors and people in broad, intermediate and limited fields.

Considering the multiple interactions that can be established between the global and local dimension, unbuilt space-interface can contribute to rebalancing spatial oppositions (accessible-inaccessible, inclusive-exclusive, autonomous-assertive, independent/dependent) often generated by processes of urban densification and excessive standardisation or specialisation. In this unbuilt space-interface we can act on: discontinuous technological-environmental components that must assume evolving, reversible, reactive and adaptive characteristics; continuous technological-environmental systems that must be configured as platforms for light infrastructural interventions designed to open up, connect, welcome, concentrate open space and make it accessible (Fig. 3).
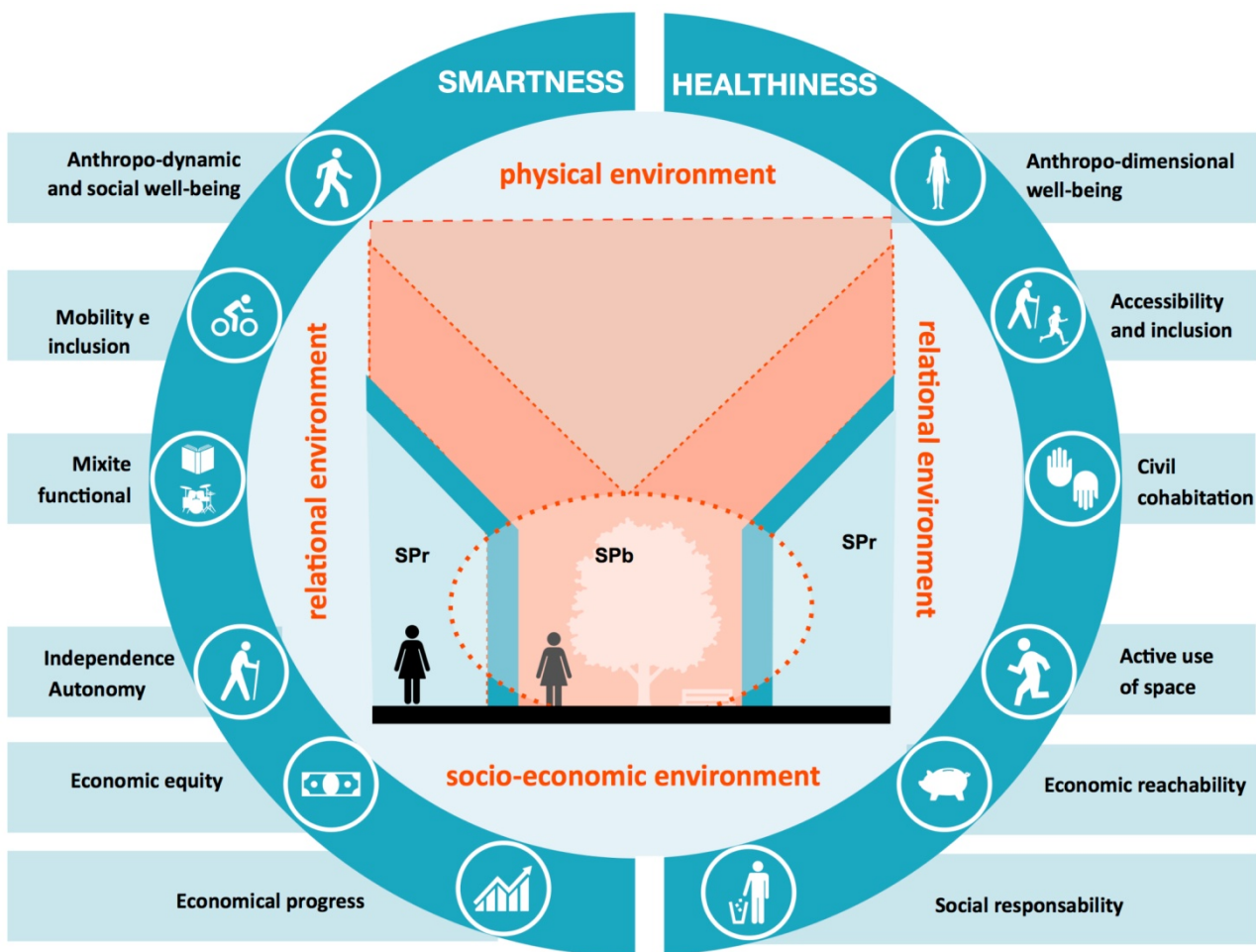
Fig. 3   Synergistic model of intervention on urban spaces according to the User Universal vision.

5. Conclusions

Intervening in the unbuilt spaces of medium and small cities, reinterpreting them as elements of a complex system of regulating-enabling interface, means expanding the challenges of urban sustainability within a field of relations and connections that move far beyond the widespread conception of design "by parts". This causes a crisis for forms of intervention limited to actions of furnishing, securing, inserting works of art, improving accessibility, facilitating digital solutions.

Working in a synergic manner, integrating a *user* and *universal vision*, delineates two opportunities: measuring the capacity for improvement of interactions among the external environment,

collective spaces and urban facilities with conditions of wellbeing for people; defining urban quality in a trans-scalar and trans-temporal manner, through flexible and adaptive scenarios of intervention.

Consequentially, it is possible to redefine unbuilt spaces in the city by considering them not as absences, voids, distances or gaps, but instead as potential sites for physical-leisure activities, social participation, the sharing of values, working in contact with nature. Today, the open spaces of the city, and in particular in large urbanised areas, show an interdisciplinary/interscalar weakness, with continuous incursions by top-down planning and drifts into bottom-up deregulation which tend to make the unbuilt environment increasingly more of a "no man's land" [23].

On the contrary, in medium and small cities the sense of place can return to being the centre of design ideas, reorienting technological solutions both for the improvement of the quality of life for inhabitants, and for the reconnection of interrupted relations between peoples' physical skills and the enabling capacity of spaces. This means reinterpreting unbuilt space as a space of mediation between physical and perceptive experiences [24], between degrees of transformation and conservation and between psychological comfort and social values [25].

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