by scholars such as J. W. R. Whitehand, Kai Gu, Yinsheng Tian and Fei Chen, Italian typomorphological studies concerned with the hierarchy and processes of components of the built environment are being presented to Chinese researchers in a more structured way than before: concepts such as 'operative history' and 'typological process' are gaining attention. Chinese cities are at present in a transition from incremental planning to inventory planning. Urban renewal and the renovation of old buildings have gradually become important tasks of urban planners and architects, along with the redefinition of urban design. Understanding the work of Muratori and Caniggia, along with that of the Conzenian school, especially their emphasis on form, resolution and time (Moudon, 1997), should help Chinese architects to build interaction between architecture and urban morphology. This should include responsiveness to the hierarchy of elements of urban form, paying attention to the specifics of urban form and historical timing.

There are conditions that existed in the 1950s in Italy with which Chinese architects may be familiar, such as rapid urbanization, population mobility, threatened traditional urban tissues, massive amounts of public housing, and urban construction fluctuating with political pressures. At that time some Italian architects who were alert to the crisis attempted to restore architectural autonomy and commenced architectural urban morphological studies. So what should Chinese architects be doing after the continuous growth of the Chinese economy over the past 30 years? It is to be hoped that some interesting answers will be forthcoming in the next ISUF conference, which will be in China again after a space of 7 years.

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Does the typological process help to build a sense of place?

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Spaces are created to accommodate human activities, so that to pursue a better quality of life (QoL) the physical environment is in need of constant change to meet evolving human requirements. However, many cities are currently suffering from a typological crisis, experiencing conflicts between the old and the new, and the neglect of local, social and cultural values. This often leads to a loss of sense of place (SoP). Major influences are mass production and the internationalization of design, technology and materials, resulting in universal architectural solutions to architecture and monotonous urban patterns. The study of urban form, particularly the subject of typomorphology, aims to reconnect urban form with its important local values. It claims that a certain degree of continuity in the transformation processes of urban form, through a typological process, can help sustain SoP, thus benefiting people's satisfaction with life (Chen and Thwaites, 2013; Rapoport, 1977). However, there is little empirical evidence supporting this statement. Empirical research is needed to monitor the level of SoP in relation to the transformation process of urban form so that the actual effect of typomorphological changes on people's lives can be better understood.

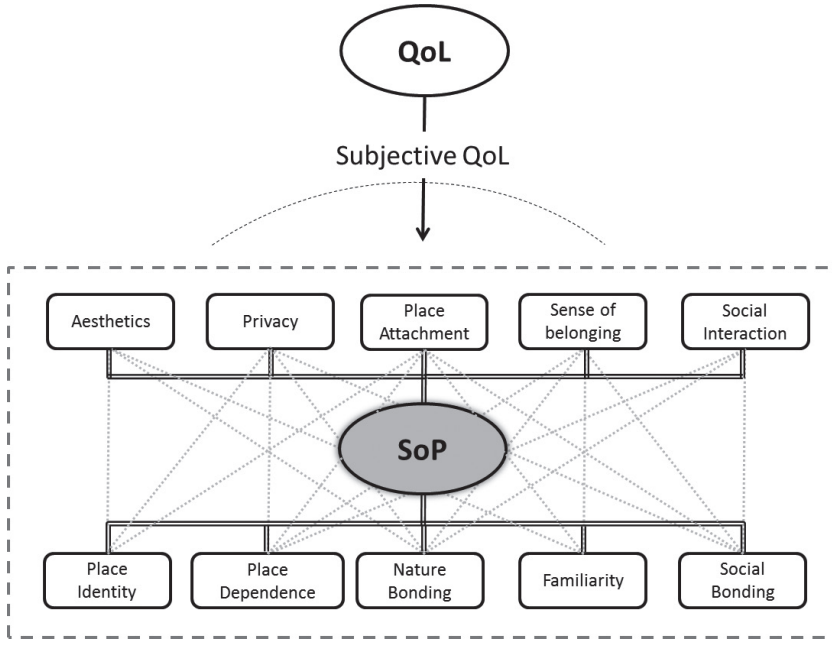

Figure 1. SoP indicators.

SoP is an essential indicator of QoL. Research suggests that a variety of factors affect SoP, including length of residence, ownership, personal characteristics, societal relations, cultural differences, ethnic and religious background, income, education, age, gender and marital status. However, the contribution of a quality physical environment to the fulfilment of place meaning and establishment of place attachment is often neglected (Stedman, 2003).

Considering the role of the physical environment in meeting people's needs and aspirations as well as creating opportunities for human interaction, the impact of different spatial relations on SoP offered by different house typologies over time requires attention. As Lynch (1960, p. 119) indicates, there is always a need for an environment which is 'well-organized', 'poetic' and 'symbolic' to give residents enhanced 'sense of place'. Therefore, one may ask whether continuous transformation of the built environment as observed in a typological process is beneficial for maintaining the SoP. This requires a typomorphological analysis and a systematic SoP assessment.

A new conceptual framework is proposed by the authors to embrace SoP assessment and typomorphological analysis. First, this framework needs to overcome the obstacle of the lack of a widely agreed definition and a set of measuring indicators of SoP. We have reviewed in detail the indicators of SoP that are an important part of QoL assessment. Various means of QoL assessment are well attested, but none have been specifically linked to in-depth study of physical forms. The conceptual framework of relevant SoP indicators is shown in Figure 1.

Secondly, it is important to identify appropriate study scales for both SoP monitoring and typomorphological analysis. Andres and Whithey (1976, cited in Pacione, 1984, p. 65) have indicated that 'it is possible for an individual to be extremely satisfied with a physical structure (of a house) but at the same time find the neighbourhood, both in physical and/or social terms, to be totally unacceptable. Such a situation could result in dissatisfaction with the total residential environment'. Thus, SoP should be discussed at different levels, such as at individual, regional, or city level. This matches the nature of typomorphological study, which is concerned with the relationship between forms at different scales. Three main scales – building, street and neighbourhood scales – are proposed by the authors to be followed in empirical research using the aforementioned framework (Figure 2).

To provide specific conditions for the research inquiry, the SoP assessment should be carried out for neighbourhoods with series of house types from different morphological periods in a given context. Some house types will show continuity

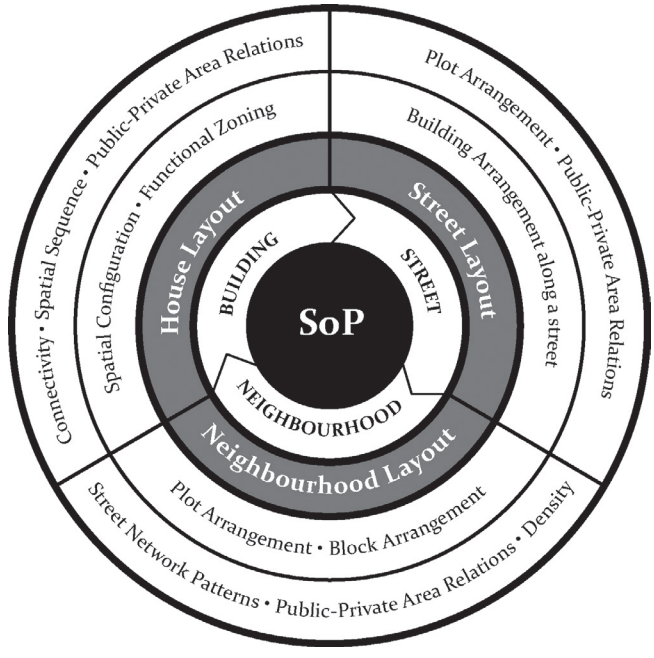

Figure 2. SoP monitoring at three scales.

in transformation, thus forming a typological process, while others will not. SoP should then be assessed at the three scales in relation to these house types. The SoP assessment requires in-depth social survey. For instance, questionnaire orientated face-to-face interviews can be conducted against the indicators determined in Figure 1 and the residents' SoP can be assessed using the Likert scale (see, for example, Jorgensen and Stedman, 2006), so that such a subjective concept can be represented numerically.

In addition, it is also important that the research design should have adequate control over the impact of the aforementioned socio-economic, demographic variables on SoP. One measure is to select case study neighbourhoods with similar demographic status and at similar locations in the city. Moreover, with regard to interview, the influence of personal status could be minimized by seeking consensus on interview questions among members of the household. Another measure could be the use of statistical tools such as the Statistical Package for the Social Sciences to make sure that the majority of results regarding the differences in SoP are derived from changes in house typology rather than differences in socio-economic and demographic variables. After the application of these measures, the results of SoP assessment should be compared, at the three scales, between neighbourhoods that have undergone a typological process and the rest.

We believe type should be treated as a point of departure in the housing design process. Thus, there is a need to verify the common belief in the field of urban studies that continuity in urban transformation helps to maintain SoP and therefore benefits residents' QoL. This is necessary to understand the reasons why the future needs to be linked with the past and what characteristics or forms in the past are worth maintaining. The authors' ongoing research is based on the rationale and conceptual framework described here.

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The study of urban form and disasters: an opportunity for risk reduction

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'Urban morphology and the resilient city' is the theme of the forthcoming Twenty-Third International Seminar on Urban Form. As one of the key concepts relating to the management of disaster risk, resilience has recently been defined as the 'capacity of systems (ranging from national, local or household economies to businesses and their supply chains) to anticipate, absorb or buffer losses, and to recover' (United Nations Office for Disaster Risk Reduction, 2015, p. 268). However, studies that link urban form to disasters have a place beyond their connections to the resilient city concept.

Cities and their components and processes were incorporated into the 'risk equation' when humans and cities were widely recognized for their significance in the production of risks and increases in vulnerability. Yet little has been made so far of the potential contribution of urban morphology to the understanding of disasters. Arguably this role is still underestimated. It is certainly timely to draw attention to aspects of urban morphology that can contribute to strategies for disaster risk reduction.

Disasters can 'become processes in themselves and as such, are subjects that must be studied from a historical perspective' (García Acosta, 2007, p. 129). Diachronic approaches (as defined by Levy, 1999, pp. 79–85) are fundamental to analysing the juxtaposition of different urban fabrics over time. They make evident the potential risks that historical processes generate. An example is the application of urban models in the colonization of Latin American countries, German models in Brazil (Geissler, 2010), and the construction of Spanish urban models in such countries as Mexico and Chile, with consequent changes in the search for safer locations (Musset, 2002). The value of identifying historical urban processes also helps the understanding of current risks, as for example in informal urbanization processes in Brazil (Okretic and Bueno, 2014, pp. 64–72).

A second perspective follows the premise that spatial configuration and street network analyses aid understanding of vulnerability and resilience. Space syntax theory has been extensively used to analyse, explain and predict some of the social phenomena related to different types and phases of disaster. At a local scale studies have demonstrated how the configurations of settlements affect evacuation from places subject to such risks as those accompanying earthquakes and tsunamis (Fakhrurrazi and van Nes, 2012; Sari and Kubat, 2012). At the urban and regional scale, street networks have been analysed in relation to the access they provide to emergency shelters (Dou and Zhan, 2011). Other researchers have analysed street networks to understand the indirect impacts of floods within cities (Gil and Steinbach, 2008), and to identify urban areas susceptible to flooding. Yet another type of analysis has focused on the interactions of recovery works, community cohesion and the built environment (Carpenter, 2013) and the assessment of the role of street networks before and after earthquakes (Cutini, 2013).

A third group of studies considers the characteristics and distribution of open spaces in relation to recovery from disasters. The integration of urban design and recovery theory is considered feasible if open spaces are regarded as a 'second city' (Allan and Bryant, 2010). The concept of resilience and its parallel meanings in urban design theories have also been discussed (Allan *et al.,* 2013): examples