

Constructing Urban Green Spaces: An Application of Kelly's Repertory Grid

ROBERT HOME, NICOLE BAUER & MARCEL HUNZIKER

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Abstract

Purpose – Urban green spaces are valuable to residents for a variety of reasons and some degree of management is needed to ensure at least their preservation, if not enhancement, in a rapidly urbanising society. Intensification of the urban environment brings pressure upon the undeveloped spaces within a city and an understanding of the needs of residents is needed if green spaces are to be managed in alignment with their wishes, so that changes will be accepted. However, gaining such an understanding of the complex relationships between people and their environment is difficult. Constructs may exist that researcher, respondent, or both have not yet articulated. This paper sets out to address this issue.

Design/methodology/approach – The repertory grid method is described as an approach that addresses this problem by researcher and respondent collectively creating a survey instrument, which the respondent then completes.

Findings – The repertory grid technique was applied in Zurich and revealed a surprisingly dominant anthropocentric attitude towards urban green spaces.

Practical/implications – The universal anthropocentric perspective allows the interpretation that residents see Zurich essentially as a place for people and furthermore see green spaces as places for themselves to pursue their own interests.

Originality/value – Application of this technique, in the context of an exploratory study, simultaneously provides direction for further research and demonstrates its utility as a tool for planners and managers of urban green spaces.

Key words: Urban centres, Greenfield sites, Environmental management, Switzerland

1 Introduction

Intensification of the urban environment in a rapidly urbanising society brings pressure upon the undeveloped spaces within a city. There is little disagreement that urban green spaces are valuable to residents for a variety of reasons and that some degree of management is needed to ensure, at least their preservation, if not enhancement. This paper begins from the assumption that acceptance by residents is a key to the success of any intervention strategy to enhance or protect nature in urban environments. It is reasonable to assume that management interventions in urban green spaces will be more likely to be accepted if they are seen to align the green space with that desired by residents. Therefore an understanding of what residents want is a prerequisite to maximising acceptance, which in turn requires an understanding of what they perceive when they consider a particular green space. The aim of this paper is to describe the application of a method used to learn the range of constructs

used by residents of Zurich, Switzerland when considering urban green spaces and, in so doing, to examine the desired state, from the resident's perspective, of urban green spaces in Zurich. Such knowledge will contribute to a greater understanding of the complex set of relationships between urban residents and urban nature.

Determining how people perceive urban nature is problematic. Constructs may exist that researcher, respondent, or both have not yet articulated. Some ways in which the research questions may be answered are outlined and the reasons for selecting personal construct theory are explained. The repertory grid method is described as an approach that addresses this problem by researcher and respondent collectively creating a survey instrument, which the respondent then completes. Immediate statistical analysis of the results allows the creation of a concept map, which can then be checked for accuracy with the respondent. The repertory grid

Robert Home
Phone: +41-44-739 2530
E-Mail: robert.home@wsl.ch

Dr. Nicole Bauer
Phone: +41-44-7392 458
E-Mail: nicole.bauer@wsl.ch

Marcel Hunziker
Phone: +41-44-7392 459
E-Mail: marcel.hunziker@wsl.ch

Swiss Federal Research Institute WSL
Social Sciences in Landscape Research
Zurcherstrasse 111
8903 Birmensdorf
Switzerland

technique was applied to the topic of urban green spaces in Zurich and produced a range of findings that further understanding of how residents assess whether green spaces meet their needs. The paper concludes with a summary of the constructs and some implications for those seeking to manage such spaces. Firstly however, some background information is needed to provide context.

The proportion of the world population living in cities is increasing dramatically, from an estimated 30% in the 1980s, through 50% in the new millennium, to an expected 70% in 2025 (United Nations 2000). Increasing numbers of people will live, work, and play in a predominantly urban environment, although the effect that this will have on society and individuals is little understood. It can however, be expected that the increase in the urbanised population will bring changes in the way many of us live our lives. Switzerland is not immune to this trend of urbanisation and features steadily growing urban areas (Schuler & Perlik 2004). Urbanisation brings pressure on space within urban areas, as the growing populations require more housing and services. Intensification of the built environment, with the understandable aim of preventing the spread of the urban into the surrounding areas, additionally increases the pressure on open space in urban areas and managers can be expected to experience pressure from an increasing number and variety of stakeholders.

2 The purpose of city greenspaces

The practical benefits that humans derive, directly or indirectly, from urban nature are described as 'ecosystem services' (Costanza et al. 1997). Ironically it is often the unseen nature that provides the direct services such as pollination of garden plants by insects. An example of an indirect benefit is the feeling of wellbeing that we get when we consider that our city does indeed host some attractive and esteemed species, such as hedgehogs. We might never see one, but it feels good to know that they are there. Similarly, it is not always necessary to actually go to nature to receive feelings of wellbeing but it is essential to know that one could if one wanted to. The knowledge that it is there can be as important to city residents as the direct uses that they gain from it. Bolund & Hunhammer (1999) point out that the health of the urban ecosystem (often represented by higher plant diversity) is directly proportional to

both the direct and indirect benefits to the human population. The principal argument for the preservation of nature within cities however, is that it provides a restorative contrast to the built environment.

Studies have consistently shown that natural environments are more restorative than urban environments (Ulrich 1983) although most have contrasted stark urban environments with natural scenes (for example Staats et al. 2003; van den Berg et al. 2003; Ulrich et al. 1991). Studies examining the restorative effects of urban green spaces have similarly found that respondents viewing urban scenes with natural elements returned higher scores on a measure of restorativeness than those viewing the same scenes without the natural elements (Hernandez & Hidalgo 2005; Peron et al. 2002). While it can be reasonably concluded that urban green spaces do have a beneficial role within our cities, there is less apparent consensus as to how these spaces should be managed and what conditions residents desire. Knowledge of the desirable conditions is particularly important in the context of urban green spaces because of the intensity of use and the high degree of community/nature interaction.

3 Political perspective of city greenspaces

Grün Stadt Zürich (2006), an organization within the Zurich local government charged with management of green spaces within Zurich state that the easily accessible and nature-like urban green and leisure spaces and recreation areas within the city and surrounds contribute to a high quality of life. Through increasing use pressure, and through the densification of the city, the green and leisure spaces increasingly placed under pressure. Grün Stadt Zürich (2006) has set itself the task of preserving these green and leisure spaces and simultaneously tailoring management to the needs of the population. However assessing the needs of the population can be difficult. Forester (1998, p153) describes the day-to-day reality of public consultation in planning as being complex and potentially misleading.

'Suggestions of "interest" and "community" are constantly put forward and interpreted, constructed and reconstructed; they are politically up for grabs, even though some can usually grab more than others. So even when some groups are more

organized, when some have more access, information, and expertise than others, senses of "interest" and "community" alike will often be multiple, internally conflicting, ambiguous, and evolving - a messy and fluid situation which presents planners with potential confusion.'

However this is the environment within which planners usually operate.

The commonly used synoptic model for resource management is an expert driven approach and consensus on a singular objective is often implicitly assumed (Lachapelle et al. 2003). Assumptions of desired characteristics of urban nature include that diverse and healthy ecosystems constitute 'better' nature (Miller 2006). Wilson (1993) proposes an innately, and genetically transferred, emotional affiliation of human beings to other living organisms that would seem, in his eyes, to be a universal human characteristic, which he labels 'biophilia'. Callicott (1993) interprets Darwin's theory of evolution as agreeing that biophilia has been naturally selected in our prehuman ancestors as part of the mechanism for bonding into mutually beneficial communities. A driver in the mechanism of bonding is the advantage that we receive by behaving within the social demands of our communities, which inherently involves consideration of the needs of others (Dietz et al. 2005). Callicott (1993, p10) asserts that 'the next stage of human moral evolution' would be to extend this feeling to 'fellow members of the biotic community', or in other words to develop biospheric altruism. Given that we are genetically programmed to like nature, and that our genetic predisposition to behave socially is reinforced by culture, it would seem that Miller's (2006) assumption is reasonable.

A further assumption is that the desired characteristics of urban green spaces in Zurich include providing a means for people to pursue their individual recreational and social needs (Schweingruber 2006). In other words they should be useful spaces. Schumaker & Taylor (1983) point out that spaces that are used by people, and satisfy user needs, contribute to a relationship they describe as functional place attachment. Winter (2005) described means of valuation of contended natural areas outside urban environments as being related to roles assigned by the valuer, which also has an implication that the usefulness to the individual is important. Shin et al. (2005) and Tinsley et al.'s (2002) studies in-

to the benefits perceived by visitors to urban nature areas identified that roles, including learning, social development, and self-development contribute to the valuation of urban nature. However, insufficient study has been carried out into the roles of urban nature for generalisations to be made and claims that urban green spaces should be useful appear to be made on the basis that they are self-evident.

While expert opinion of the desired conditions is informative, and indeed necessary, it sheds little light on the actual conditions desired by the community, and some means of integrating stakeholder opinion is needed (Dinsdale & Fenton 2006; Lachapelle et al. 2003). Matthies & Kroemker (2000, p 65) comment on the widely held assumption that management should "optimally be tailored to the specific situation by involving the target group right from the planning stage of the intervention". They have essentially described the widespread acceptance of participative planning, which is an effective way of learning desired conditions. However, Lachapelle et al. (2003) point out that resolving 'wicked problems' and 'messy situations' in urban environments requires a consensus of goals by stakeholders under conditions where problems may not be well defined, values may not be shared, and managers may lack the financial and time resources to involve all stakeholders in the decision making process. Understanding how landscapes, in this case urban green spaces, are perceived and against which criteria they are assessed, may contribute to finding some means of measurement of stakeholder opinion under the common, 'less than ideal', conditions.

Most studies into landscape perception (for example Kaplan & Kaplan 1989; Peron et al. 2002; Purcell et al. 2001) have presented respondents with a selection of visual depictions of environments, asked questions about preference and then looked at common characteristics within the preferred environments. However, there has been little attention given to differences between the constructs that the respondents themselves have used, and had possibly not yet articulated, and the constructs used by the classifying researcher. There is also uncertainty whether findings of preference for natural landscapes would be applicable to urban landscapes. Bourassa (1990) postulates that preferences for natural landscapes may be based on factors quite different from those that serve as the basis for preferences for urban landscapes. Given the

absence of evidence to contradict Bourassa's (1990) postulation, it appears that no conclusions can be confidently drawn from the literature with regard to perceptions of urban green spaces. Primary research in the field is therefore necessary.

4 Field work as basis of research

The temptation is to formulate a survey with a list of possible activities and a list of possible attitudes towards the natural environment. It would probably return reliable results but there is a risk that some of the ways of seeing nature may be missed. However, Thompson (1998) asserts the need for a move away from consensus-based measures of landscape preference and towards information-gathering methods. Qualitative study might provide a richer source of data, and reveal constructs that the researcher had simply not thought of. Silverman (2001) argues that the status that is to be attached to the collected data must be considered when selecting an appropriate method of data collection. Interview respondents can be considered to be sources of data or alternatively, as providers of actively constructed narratives. In other words, do we take a positivist or a constructivist perspective? Holstein and Gubrium (2004) argue convincingly that all interviews are active and that knowledge is constructed in association with interviewers. In the context of this study, the construction of the narrative is precisely what we are interested in so the choice of the constructivist perspective is clear.

Cognitive mapping, developed by Axelrod (1976) and applied to landscape preference by Steven (2006) looks promising but it seems to concentrate on which physical details are noticed and additionally requires a common language and protocol. Focus groups and Concept mapping (Novak & Canas 2006) look similarly promising, however both data collection techniques also rely on a common language and protocol, while concept mapping also requires drawing ability. Provision of a researcher-created language and protocol would defeat the purpose of the study, which is to learn how the respondents construe the urban landscapes, and there is no evidence to support the assumption of a common language.

Kelly (1955/1991), remaining within the constructivist movement, developed a

plausible theoretical foundation, which he called Personal Construct Theory and an associated practical technique to apply the theory, which he called the repertory grid. Kelly (1955/1991) suggests that the way we construe, and make sense and meaning of the world, can be expressed by way of contrasts. He also suggests that a strategy to find what people think is to enter into a discussion with them, thus solving the problem of shared language. Personal Construct Theory appears appropriate for study into the perceptions of landscapes in general and for this study in particular.

Kelly developed the theory within the field of psychology and it has since been applied to a wide variety of fields, but especially in psychiatry and market research (Jankowicz 2004). Although Mathews & Ilbery (1982) and Thompson (1998) have each suggested Personal Construct Theory methods to explore the cognitive constructs, which people use in understanding and responding to landscapes, it appears that only Dinsdale & Fenton (2006), in their study of understandings of coral reef condition, have applied the method to examine ascription of meanings to particular physical environments.

5 Personal construct theory

Personal Construct Theory proposes that people have an individual view of the people and events that are part of their life (Kelly 1955/1991). People use their experiences and constant examination of the people and places around them to create a personal explanation, or construct system, of how the world works. Kelly (1955/1991) describes a person's construct system as being composed of a finite number of dichotomous constructs with people predicting what will happen in certain situations based on their past experiences and observations. The constructs are continuously tested as further observations are collected and revised if the predicted outcome does not occur (Fransella & Neimeyer 2004).

One of the central assumptions is that constructs are dichotomous and built up from contrasts rather than absolutes (Jankowicz 2004). An element, in this case an urban green space, will receive meaning by it being seen as both that which it is and contrasted with that which it is not. However, in expressing a meaning, an element is evaluated within a contrast rather than a

negative. For example the meaning intended by the descriptor ‘attractive’, can best be understood when opposed to its contrast which may be say, ‘disinteresting’, ‘ugly’, or ‘repulsive’. Accordingly, learning constructs, with both poles described, allows the researcher to gain a fuller understanding of how a person construes an element than if only a descriptor was found (Fransella & Neimeyer 2004). Kelly’s (1955/1991) repertory grid was specifically designed to elicit dichotomous constructs within the framework of Personal Construct Theory.

The repertory grid technique involves identification of elements that are both the objects of study and the stimulus. Although other elicitation techniques exist, the triadic method is commonly used and will be described here. Respondents are presented with a group of three elements and asked to nominate which two elements are somehow similar to each other and different from the third. The justification for differentiation of the elements is noted as a pole of a construct. The respondent is then asked to identify the contrast to the elicited pole, thus completing the construct. Each of the elements is then rated on a likert scale with each pole representing the extremes of the scale. The process is repeated using various combinations of elements until no new constructs are forthcoming.

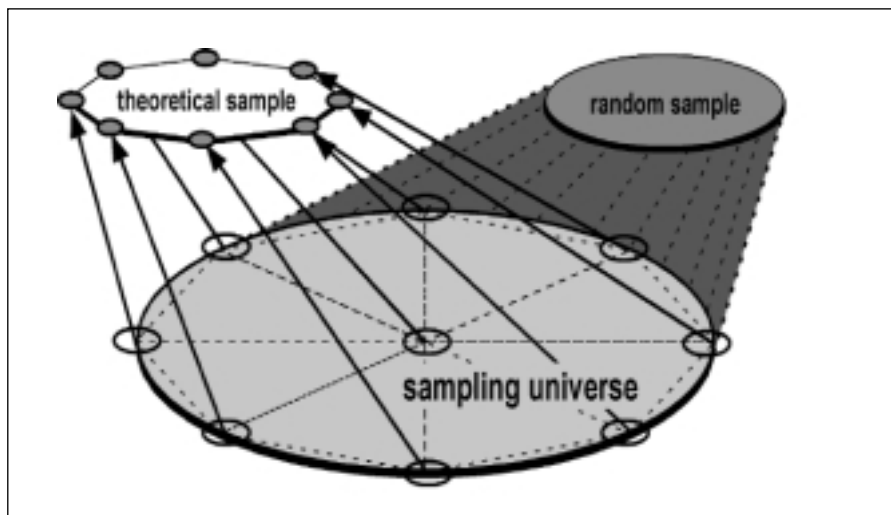
Disadvantages of the grid technique include that it is reasonably demanding on the respondent and that it requires a suitably quiet place for the interviews to be carried out. Bradshaw et al. (1993) point out that only a fraction of the ideas latent in personal construct theory have been tapped and that repertory grid techniques can be extended in various ways and integrated with tools springing from complementary perspectives. However, the exploratory nature of this study, combined with sensitivity to the demands placed upon respondents, suggest that the repertory grid, as a stand-alone tool, is appropriate.

6 Method

6.1 Sample

The interviewees (n=17) were selected according to the “theoretical sampling strategy” (Strauss and Corbin 1990; Patton 1990). Winter (2005) highlights the importance that the sample should include indi-

Fig.1: Sampling strategy used in this research



(Source: Hunziker 1995)

viduals who may hold values in different strengths. Statistical representativeness is not intended to be the principle of this strategy but rather one of “maximum variety” (Patton 1990). Thus, a theoretical sample, also called a “purposeful” sample (Patton 1990), consists of people with widely differing opinions, which represent the margin of the sampling universe (fig. 1). The sampling universe in this study consisted of the residents of Zurich.

The ‘seed’ interview partners were selected according to membership of particular groups that could be reasonably suspected to be a source of differing opinions. A stay at home parent of small children, a dog owner, a member of a nature protection organization, and an inner city office worker were chosen as the initial interview partners. At the conclusion of each of the interviews, the respondent was asked if he or she knew of anybody who would hold a clearly different opinion. The ‘snowball’ procedure was repeated until no new constructs were forthcoming from new interview partners. Nine women and eight men were interviewed with ages ranging from 22 to 75 years. As would be expected from the sampling method, the sample contained members from a broad section of the community. For example, three of the respondents were students, two were stay at home parents, two were retired, one was unemployed, and the remainder were in the workforce. Two of the respondents owned private gardens, six had access to communal gardens, eight respondents had balconies, and five lived in apartments with their only access to green as public green spaces.

6.2 Grid construction

Constructs were elicited using the triadic method using researcher-supplied elements so that the focus would remain on a common set of variables. Nine photographs of urban green spaces were selected in consultation with an urban ecologist as being representative of the various green spaces within Zurich, and were used as stimulus materials. Respondents were asked to imagine their ideal urban green space, and this imaginary ideal landscape was used as a tenth stimulus. Use of the Repgrid IV software package allowed immediate on-site processing of results, which could be immediately checked for validity with the respondents. All of the interactions between interviewer and respondent were recorded.

Individual results give insight into the constructs used by individuals when considering urban green spaces. However, the purpose of the study is to learn the range of constructs used in the population. Compilation of the results from the individual grids revealed 83 constructs and some distillation is needed to present the results in a way that is interpretable. The selected technique was the content analysis procedure described by Jankowicz (2004).

6.3 Analysis between grids

Holsti (1968) pointed out that content analysis requires the identification of the unit of analysis, for example text, paragraph, or key word. In this case, the constructs are the base unit of analysis and provide both

the content unit and the context unit. Jankowicz's (2004) core-categorisation procedure was used to classify constructs however, particularly when considering nuances of language, there is a question of reliability. Hill (1995) identified three types of reliability in terms of content analysis.

Stability: That the same classifier would produce the same categories and allocate the same constructs to categories if the procedure were repeated.

Reproducibility: A second classifier would understand and reproduce both categories and classification

Accuracy: That constructs are allocated to categories according to consistent criteria.

Jankowicz's (2004) method addresses each of these concerns in its design, based on peer reproduction and comparison. The constructs were categorised, while a colleague simultaneously and independently created a classification. The results of these categorisations were cross-tabulated and revealed clear agreement on four categories and partial agreement on two more. Fifty-three from 83 constructs (64%) were independently classified alike according to the similar categorisation schemes.

The categories were then negotiated until there was agreement on the eight categories presented as the results of this paper. The next step was to each reclassify the elicited constructs according to the new classifications. Eighty of the 83 constructs were identically classified indicating an agreement of 96.5%. However this result does not take random chance of agreement into account. Cohen's Kappa was calculated and returned a respectable result of 0.95. It was expected that the difference between Cohen's Kappa and percentage agreement would be small because of the number of cells (81) in the grid.

7 Results and discussion

The implication of the sampling strategy aiming for maximum variety is that, while no conclusions into proportions existing within the community can be drawn, it can be reasonably assumed that the full range of constructs has been found. Generalisations can be made on the basis of what was common to all responses and also by what was absent from all responses.

The constructs were classified according to Table I.

Table 1: Categories of constructs

Category	Definition	Number Constructs
Use /Usefulness	From the individual's perspective. The place is useful / The place is not useful	11
Access	The space is accessible / the space is inaccessible	9
Stimulation	The space inspires or stimulates / The space is uninspiring	13
Plant Growth	Vigorous plant growth / Restricted plant growth	4
Planned nature	Landscape is formed to appear natural / Landscape is otherwise formed	13
Attracts	From a human perspective, landscape attracts the individual / Landscape is uninviting	10
Restrictions	Social or resource restrictions on activities / activities afforded by resources	9
Management	Intensive human intervention / lack of human intervention	13
Miscellaneous	poles not related	1

Common to all constructs is an anthropocentric perspective and no evidence was found in Zurich to support Miller's (2006) assumption that ecological quality is included in residents' perceptions of green spaces. The ecological quality of nature was not mentioned as a construct, despite conscious efforts in sampling to find a respondent who would include it, and no differentiation was made between exotic and native species. Although four constructs were categorised as relating to 'plant growth', a review of the transcripts revealed that all four were referring to the extent that the vegetation had been allowed to grow. These constructs could possibly have been categorised under 'management' but were allocated to a separate category because of their explicit mention of vegetation. The universal anthropocentric perspective allows the interpretation that residents see Zurich essentially as a place for people and that the health of urban ecosystems is of little relevance to them. This finding suggests that Wilson's (1993) biophilia is manifest at, at most, an abstract level in Zurich residents and that a management objective of achieving a healthy ecosystem will not automatically align with the wishes of residents.

A further commonality was that the anthropocentric perspective is, more specifically, egocentric. Absent from all constructs were indications of consideration of the needs of others which Dietz et al. (2005) suggest as a social imperative. While there was evidence that respondents were able to subsume the construing of close family members, such as their own children, there was little evidence of effort to see the world through the eyes of other people. Twenty-Nine of the identified constructs related to the usefulness of a green space to the indi-

vidual, whether the space was accessible to the individual, and whether there were restrictions in engaging in chosen activities. While these constructs were not universal, and therefore no generalisations can be made, this finding appears to support Schweingruber's (2006) assertion that the usefulness, to the individual, is included in the perceptions of urban green spaces.

8 Conclusion

This study revealed a dominant anthropocentric attitude, in the case of Zurich, towards urban green spaces. This allows the conclusion that the city is considered a place where the needs of people, and especially the individual, are seen to be the primary consideration. It can be concluded that planners operating within the city would be well advised to tread carefully, given the intensity of use and the finding that opinions are commonly held, if nature is to be encouraged for its own sake. A derivative of the anthropocentric and egocentric perspectives, and a further commonality between respondents, was that all had an opinion of, and were able to articulate a relationship with, urban green landscapes. While it was evident with categories of 'stimulation' and 'attractiveness', that some degree of aesthetic appreciation remains, the principle considerations appear to be how the respondent would interact with the space.

These opinions can be seen as evidence of the functional place attachment described by Schumaker & Taylor (1983). People with an attachment to a particular place are likely to have a greater engagement if the place is perceived to be under threat.

This finding, in light of Priskin's (2003) assertion that public acceptance of interventions is affected by people's perceptions of the environment, underlines the importance of understanding the wishes of stakeholders when designing management strategies or interventions. Matthies & Kroemker's (2000) tailored interventions should therefore adopt a similar perspective and tune urban green spaces towards optimisation for human use and aesthetics.

That these findings were revealed supports the choice of a research method that did not supply constructs to respondents. Importantly, this method allowed participants to provide their own meanings rather than being constrained by terms provided by a researcher. There is no reason to suspect that respondents would not answer questions, about for example, the ecological value of urban landscapes had they been asked, which may have suggested the relevance of constructs that do not actually exist. Kelly's (1955/1991) repertory grid method appears to be useful in identifying the underlying meanings people ascribed to the natural urban environment, which, in turn, provides decision makers with a tool for identifying the collective goals of stakeholders.

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