



Seeing the Urban Forest Through the Trees: Building Depth Through Qualitative Research

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Abstract. Urban forest research using quantitative research methods has enabled researchers and policymakers to make informed decisions. Using qualitative research methods may increase our understanding and knowledge of the urban forest. This article describes the nature of qualitative research, describes why it has not been a common research method in urban forestry, and illustrates what role it may have in urban forest research. We conclude that qualitative research may enrich our knowledge and understanding of the urban forest.

Key Words. Qualitative analysis; quantitative analysis; research methodology.

The most common methodology for urban forest research has involved quantitative research data and methods. Indeed, quantitative research has allowed urban forest researchers to study such diverse topics as the relationship between the urban tree canopy and summertime household energy use (Jensen et al. 2003), benefit–cost analysis of different tree species (McPherson et al. 2003), and approaches for residents and government officials to quantify the value of trees in small communities (Maco and McPherson 2003). These studies, and many others like them, help us to understand the critical role that urban forests have in the urban environment. They also provide a way for researchers to communicate with others about the benefits of the urban forest in real-world terms. Quantitative studies usually do this through reducing numerical measurements into conclusions.

Conversely, qualitative research methods have not been as commonly used. Qualitative methods are used either when a question needs to be described and investigated at some depth or the meaning of something needs to be found (McCaslin and Scott 2003). Qualitative data are usually in the form of words, phrases, descriptions, or quotes rather than numbers. The qualitative research approach has been more prominent in the fields of sociology, psychology, education, and nursing. In the past 2 decades, however, researchers in other fields have discovered the value of qualitative data and methods (Miles and Huberman 1994). We feel that qualitative data and methods have been underrepresented in urban forestry literature. The purpose of this article is to elucidate the important role that qualitative research could have in strengthening our understanding of many urban forest dynamics. We are not suggesting that quantitative methods are no longer relevant to urban forestry. Rather, we are arguing that qualitative data

and techniques can provide greater insight into many of the urban forest issues that urban foresters, elected officials, urban residents, and other stakeholders continually encounter. We first describe the basics of qualitative research and provide examples of appropriateness. Then, we describe some applications to urban forestry. Finally, we provide conclusions on the future of qualitative research in urban forestry.

WHAT IS QUALITATIVE RESEARCH?

Qualitative research is a tool that allows researchers to investigate the depth, patterns, and understanding of an issue. Traditional quantitative methods create a research question and identify data forms and variables. In survey research, much time and effort is placed on creating scales that adequately measure the research question. A priori determination of research questions and survey responses, however, limits one's understanding of social or individual phenomena. Qualitative researchers approach a research question without either a hypothesis or a question to prove or disprove. They instead focus on understanding the phenomena and potentially creating new knowledge. The research question is used to guide the study but does not limit data collection and analysis. As data emerge, they may suggest information that either expands or narrows understanding of the original question. For example, McLean and Jensen (2004) used qualitative research to propose a paradigm of how community leaders gain knowledge and understanding of the urban forest. During data analysis, they stated, "It became apparent early in the data collection process that there were significant differences in the knowledge of leaders about the urban forest" (p. 592).

Cook and Reichardt (1979) identified 11 differences between quantitative and qualitative research (Table 1). Starting with the research question, quantitative and qualitative research begins to diverge. Researcher frames are a function of the research approach and are formed in the assumption about the study question. The qualitative researcher takes an anthropological world view assuming a holistic approach focusing on inductive reasoning. The quantitative researcher uses a natural science world view assuming a particularistic approach using deductive reasoning. The world view frames of each researcher are all important in understanding the differences and acceptance of each type of research. Quantitative researchers measure, standardize, and replicate observable events. Qualitative researchers focus on human experiences and perceptions from an in-depth perspective trying to understand the phenomena. This subjective, insider-centered approach is in direct contrast to the objective, outsider hands-off approach of the quantitative researcher. The quantitative researcher frequently argues the qualitative researcher has the potential to be seduced by the subjects and becomes an advocate for their perspective rather than taking a detached objective view using data collection techniques that minimally impact on the research subject. In response, the qualitative researcher argues for the need to understand the phenomena contending that only through gaining understanding and insight can knowledge be created. Thus, qualitative research is less about proving a hypothesis than it is about understanding phenomena and creating emerging paradigms.

Qualitative researchers focus on process rather than outcome. Outcome is a discovery process emerging from the data gathered by the qualitative researcher. Coffey and Atkinson (1996) stated "that one should be looking for patterns, themes, and regularities as well as contrasts, paradoxes, and irregularities" (p. 47) in the data. Such data analysis is continuous and collection methods may vary during the research to explore a particular phenomenon in greater detail. Such an approach sometimes gives the appearance of a lack of re-

searcher control. To a quantitative researcher, qualitative research appears to be a messy process with the potential to introduce significant bias. To the qualitative researcher, this external appearance is not important, because they view the process as orderly, structured, and emerging. The continual interplay of data, data analysis, refinement, and asking different questions are all essential. In an effort to understand the phenomena, the qualitative researcher spends time investigating the detail. This all suggests that qualitative researchers are discovery-oriented (data emerge from interviews, observations, and the like) and that a dynamic reality or slice of life is assumed. Key to this is the belief that through qualitative research, an explanatory process is ongoing as opposed to the quantitative researchers' focus on the belief their research will be confirmatory and verification-oriented.

Critics of qualitative research have suggested the methodology is too subjective and researcher biases influence results; results are opinion rather than fact—intuition rather than logic. Qualitative reliability and validity can be demonstrated through careful construction of the study methodology, including multiple independent assessments of data, extensive use of quotations, using multiple data sources for triangulation purposes, instituting member checks, and having prolonged interaction with participants.

Qualitative research should not be considered the antithesis of quantitative research, but another research tool to gain further and sometimes more intimate understanding and knowledge. If a field is limited to a single conceptual and methodological approach, the questions that can be asked and the resultant outcomes are also limited.

FOUR RESEARCH AREAS

Four research themes pervade recent urban forestry literature: (1) economic costs and benefits (e.g., Nowak and Crane 2002; Jensen et al. 2003; Laverne and Winson-Geideman 2003; Sydor et al. 2003); (2) ecological and environmental benefits (e.g., Johnson and Gerhold 2001; Streiling and

Table 1. Differences between quantitative and qualitative research (Cook and Reichardt, 1979, p. 10).

Qualitative paradigm	Quantitative paradigm
Advocates the use of qualitative methods	Advocates the use of quantitative methods
Concerned with <i>understanding</i> human behavior from the actor's frame of reference	Logical-positivism; seeks the " <i>facts</i> or <i>causes</i> of social phenomena with little regard for subjective states of individual"
Naturalistic and uncontrolled observation	Obtrusive and controlled measurement
Subjective	Objective
Close to the data; the "insider" perspective	Removed from the data; the "outsider" perspective
Grounded, discovery-oriented, exploratory, descriptive, inductive	Ungrounded, verification-oriented, confirmatory, reductionist, inferential, and hypothetico-deductive
Process-oriented	Outcome-oriented
Valid; "real," "rich," and "deep" data	Reliable; "hard" and replicable data
Ungeneralizable; single case studies	Generalizable; multiple case studies
Holistic	Particularistic
Assumes a dynamic reality	Assumes a stable reality

Matzarakis 2003); (3) social benefits and perceptions (including the allocation of urban forest resources to various socioeconomic groups) (e.g., Austin 2002; Hammitt, 2002; Kuhns et al. 2002; Kuo, 2003; Westphal, 2003); and (4) urban forest policy (e.g., Martin et al. 2003; Schroeder et al. 2003; Wolf 2003a, 2003b; McLean and Jensen 2004).

Research on economic costs and benefits places the urban forest in the context of the local/regional economy and describes how the urban forest impacts the economy. Ecological and environmental benefits, impacts, and research describe the positive and negative influences of urban forests, ecological management and maintenance of the urban forest, and elaborates new research methodologies. Research on social benefits and perceptions elucidates the role of the urban forest in a social context, whereas public policy research helps to define the role of policy to maintaining and promoting the urban forest.

It is possible for qualitative research to provide deeper understanding and comprehension in each of the areas. For example, qualitative research could be used to examine how city residents perceive the urban forest relative to other city services and provide insight into how scarce monetary resources are allocated. It could evaluate how thoroughly local government leaders understand ecological and environmental benefits. The better these benefits are understood, the more favorable local government policy might be influenced (McLean and Jensen 2004). Social benefits of the urban forest could be examined through comprehensive urban forest quality of life and/or sense of place interviews.

Dwyer et al. (1994) stated, “we find that the effort of many urban forestry programs to expand or sustain trees and forests is justified in terms of a few fairly simple dimensions of their significance to urbanites, such as beauty, shade, cooling, or their contribution to global gas balances” (p. 137). Qualitative researchers would ask, “How might we extend existing knowledge to a greater understanding of the urban forest?” Wolf (2003a) found that the consumer/environment relationship is positively correlated with urban greening in inner-city business districts. The author drew this conclusion from a national survey and a series of statistical tests that generated quantitative results. A qualitative researcher could ask consumers a series of questions about why the areas in which they are shopping are attractive. Knowing that trees and mixed vegetation are important, why not find out if there are other attributes that may not have been measured and could contribute to our understanding? For example, what if consumers do not perceive trees as the most important attribute? A qualitative analysis might discover that trees are an important attribute but that quality of the shops, availability and accessibility of parking, and transportation patterns into and out of the area are equal or more important attributes. Then the question might be, would consumers still come to the area in the absence of trees? This line of research would deepen

our understanding of the consumer/environment relationship. Indeed, Dwyer et al. (1994) suggested “the close bonds between people and their urban forests may be enhanced by almost daily contact . . . and by the distinct contrast between trees and the built-up environment” (p. 138).

IMPLICATIONS OF QUALITATIVE RESEARCH FOR URBAN FORESTRY

Qualitative research may enrich our understanding of the urban forest but has been notably absent in the urban forestry literature (Figure 1). From 2002 to 2004, only three of 125 articles in the *Journal of Arboriculture* implemented qualitative methodology. These were written in a quantitative format, perhaps reflecting a bias of reviewers.

We assessed the potential for qualitative methods to contribute to each of the four research themes (Figure 2) based on previously suggested definitions. Altering the assumptions present in the definitions can result in a shift of potential contributions. For example, by using qualitative data from social benefits as a base, researchers could design instruments that take into account social benefits and quantify the data in terms of economic costs and benefits. Hence, the ability to identify and use qualitative data is limited by the researcher’s willingness to explore and implement new research methodologies.

UTILIZATION OF QUALITATIVE RESEARCH: EXPANDING QUANTITATIVE RESEARCH

There is a symbiotic relationship between quantitative and qualitative research. Conducting qualitative research projects in advance of or following the existing research might increase the usability and benefit a larger audience. This section presents three prototypical quantitative research articles and suggests how qualitative methods might enhance the existing research.

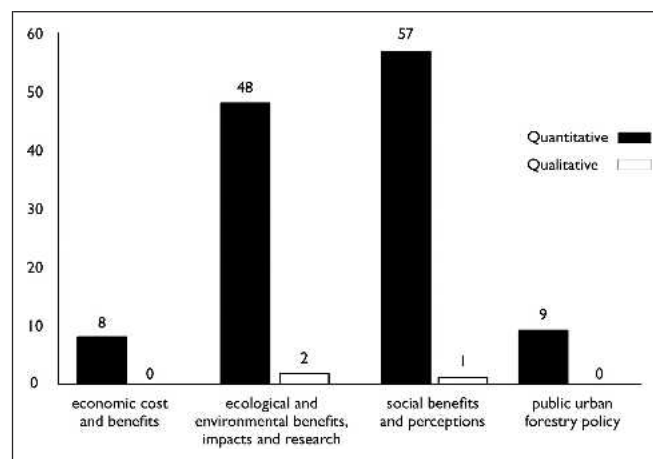


Figure 1. Distribution of quantitative and qualitative articles in the *Journal of Arboriculture* for 2002 through 2004.

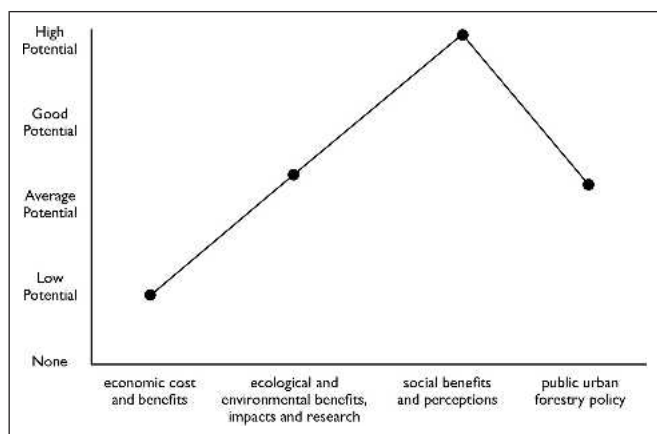


Figure 2. Potential for qualitative research contributions to urban forest research themes.

Jensen et al. (2003) examined the quantitative relationship between summertime household energy consumption and the extent of urban tree canopy. The authors found a slight negative relationship between leaf area and energy use. Qualitative research could have been used to expand understanding of the dynamics of this relationship by examining other factors that affect energy consumption such as individual owner perceptions of which rooms in their homes are the warmest, the perceived role of urban trees, and the perceived willingness to have trees on their property.

Laverne and Winson-Geideman (2003) studied the role of the urban forest and landscaping on rental rates. The authors found a positive quantitative relationship between landscaping and rental rates. Qualitative research could amplify this study with a more thorough understanding of why (what factors) people are willing to pay more to rent buildings that have good landscaping. Furthermore, qualitative research might discover what kinds or models of landscaping are considered good by potential tenants.

Schroeder et al. (2003) studied the status and needs of community tree programs in Illinois through the results of two surveys. The surveys showed strong positive values of community trees and that communities vary in resources, problems, and needs of the community forest. This study reported the statistical or quantitative results from the surveys. Qualitative research could determine the various political, social, cultural, and socioeconomic factors that contribute to a lack of resources and differing needs. This kind of analysis would enable other researchers to more fully understand the dynamics associated with individual community tree programs.

CONCLUSION

The opportunity for urban forestry-based qualitative research is significant. However, what limits the use of qualitative

research in urban forest research? First, it appears that researchers are not trained in qualitative methods or are not rewarded for such research. Second, it appears that reviewers share a similar bias frequently measuring qualitative manuscripts using quantitative paradigms.

Finally, each of the four research areas has some to great potential to heighten researcher, practitioner, and consumer understanding of the urban forest. McLean and Jensen (2004) expanded the concept of knowledge and understanding of community leaders of the urban forest. This type of approach might strengthen a broader base of support for the urban forest.

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Résumé. La recherche en foresterie urbaine au moyen de méthodes de recherches quantitatives a permis aux chercheurs et aux politiciens de prendre des décisions adéquates. L'emploi de méthodes de recherches qualitatives pourrait permettre d'accroître notre compréhension et notre connaissance de la forêt urbaine. Cet article décrit la nature de la recherche qualitative, pourquoi elle ne s'est pas avérée être une méthode commune de recherche en foresterie urbaine et illustre quel rôle cela pourrait avoir dans la recherche en foresterie urbaine. Cet article conclut que la recherche qualitative pourrait permettre d'enrichir notre connaissance et notre compréhension de la forêt urbaine.

Zusammenfassung. Urbane Forstforschung hat Forscher und Politiker durch die Verwendung von quantitativen Methoden in die Lage versetzt, fundierte Entscheidungen zu treffen. Die Verwendung von qualitativen Methoden könnte unser Verständnis und Wissen über urbane Wälder vergrößern. Diese Studie beschreibt die Natur von qualitativer Forschung, beschreibt, warum es hier keine gewöhnliche Methode ist und illustriert, welche Rolle sie in urbaner Forstforschung haben kann. Wir kamen zu dem Schluss, dass qualitative Forschung unser Verständnis und Wissen an dieser Stelle bereichern kann.

Resumen. La investigación en dasonomía urbana empleando métodos cuantitativos ha habilitado a los investigadores y tomadores de decisiones para realizar decisiones informadas. Sin embargo, el empleo de métodos de investigación cualitativos también puede incrementar nuestro entendimiento y conocimiento del bosque urbano. Este reporte indica la naturaleza de la investigación cualitativa, describe por qué no ha sido un método común de investigación en dasonomía urbana e ilustra qué papel puede tener en la investigación en dasonomía urbana. Se concluye que la investigación cualitativa va a enriquecer nuestro conocimiento y entendimiento del bosque urbano.