Assessing restorative components of small urban parks using conjoint methodology

Helena Nordh\textsuperscript{a,}\textsuperscript{*}, Chaham Alalouch\textsuperscript{b}, Terry Hartig\textsuperscript{c,1}

\textsuperscript{a} Department of Landscape Architecture and Spatial Planning, Norwegian University of Life Sciences, Box 5003, NO-1432 Ås, Norway
\textsuperscript{b} School of the Built Environment, Heriot Watt University, Sir William Arroll Building, Edinburgh EH14 4AS, Great Britain, United Kingdom
\textsuperscript{c} Institute for Housing and Urban Research, Uppsala University, Box 785, SE-80129 Gävle, Sweden

\textbf{A R T I C L E   I N F O}

Keywords:
- Attention restoration
- Landscape architecture
- Park design
- Restorative environment
- Stress recovery

\textbf{A B S T R A C T}

Many studies have supported the proposition that natural environments contribute positively to psychological restoration. Less attention has been given to the relative importance of the physical environmental components that contribute to the restorative potential of such environments. The aim of the current study was to investigate the relative importance of environmental components, in small urban parks, for people looking for somewhere to sit down and rest. To address this aim, we used choice-based conjoint analysis, coupled with hierarchical Bayes estimation, to assess the utilities assigned to grass, bushes, trees, flower beds, water features, and the number of other people in the park. Via a web-based questionnaire, adult residents of Oslo, Norway (N = 154) were presented with text describing successive pairs of park alternatives. Each alternative was comprised of a set of environmental components at different levels. The respondents were to choose the preferred alternative in each pair, given that they were fatigued and looking for a place to rest for a little while. The amounts of grass, trees and other people had the most influence on their choices among park alternatives. Responses across groups defined by age, gender and earlier experience with parks and nature were relatively homogenous. From a planning perspective, the findings indicate the importance of focusing on structural components such as grass and trees rather than decorative components such as flowers and water features.

© 2011 Elsevier GmbH. All rights reserved.

\textbf{Introduction}

Scientific knowledge about nature as a setting for restorative experiences has developed mainly during the last 50 years (for reviews, see Knopf, 1987; Hartig, 2007). Many of the empirical studies have compared natural settings with outdoor public urban spaces that are predominantly built (see for example Hartig et al., 1996; Laumann et al., 2001; Herzog et al., 2003; Hartig and Staats, 2006). Such research has supported general policy and planning measures, such as the preservation of natural areas (e.g., County of Stockholm, 2003). However, the studies provide relatively little guidance for specific environmental design measures (Velarde et al., 2007). The need for such guidance is growing (James et al., 2009). In Europe and elsewhere, the trend in city planning is towards densification (Beatley, 1999). Given that densification commonly entails the loss of access to some natural areas and open spaces within cities, it is of pressing importance to identify ways to create opportunities for restoration with the outdoor spaces that remain accessible to the public within cities (Thwaites et al., 2005; Van den Berg et al., 2007).

In this study we focus on small parks and open spaces as settings for psychological restoration. This focus encompasses a range of outdoor public spaces, from grey ones, square-like, with hard ground cover and little vegetation, to green ones with much vegetation. The type of park is referred to as a pocket park (Nordh et al., 2009). All pocket parks of interest here are open to the public and located near a city centre, among dwellings, businesses, and other buildings. They are no bigger than an ordinary city block. These spaces presumably will become increasingly important as settings for restoration as the demand for densification of cities increases. They provide opportunities for restoration near the workplaces and homes of urban residents. They function as spaces where people can get away from daily demands mentally and physically and become pleasantly engaged by the greenery and other features (Kaplan, 1995; Kaplan et al., 1998; Nordh et al., 2009).

Small parks may function well as settings for restoration. The possibility for restoration afforded by a pocket park is not only a matter of its size, but also a matter of its design and the components used to create it (Nordh et al., 2009). By exploring...
the relative importance of specific components in the environment, rather than comparing examples from broad categories of natural and built as in much research on restorative environments, this study helps to fill a gap in the empirical literature concerning restorative environments (see for example Velarde et al., 2007). It also provides potentially valuable information to professionals working with landscape architecture and planning who must make decisions about the design of our future cities (James et al., 2009).

The components of interest in this study are grass, bushes, trees, flower beds, water features, and the number of other people in the park. The choice of components is based on research by Nordh et al. (2009, 2010). In a study concerned with the restorative quality of small urban parks and open spaces in Scandinavia, Nordh et al. (2009) found that the environmental components most predictive of the judged likelihood of restoration were the percentage of ground surface covered by grass and the amount of trees and bushes visible from the given viewing point. The more vegetated the image was, the higher the aggregate rating of restoration likelihood it received.

The study by Nordh et al. (2009) focused on visual aspects of pocket parks, using photographs as the media for presentation of the parks to research participants. In the present study we used a web-based approach, presenting lay people with brief texts that described different combinations of physical components in a park. By presenting the environments with words instead of photos, the approach relied on the respondents’ ability to imagine the different alternatives by referring to their own experiences. The components all commonly exist in pocket parks; even people without any professional knowledge should be able to imagine them.

Although we assumed that most if not all people could imagine the different park components on the basis of past experience, we did not assume that all people would assess the different components similarly. For example, previous research indicates that demographic factors can influence environmental preferences (Stamps, 1999). Information on such differences may also be of interest to practitioners in planning new pocket parks. We decided to compare evaluations of the park alternatives on the basis of our respondents’ age, gender, frequency of park visits, and earlier professional experience with parks/nature. This set of variables overlaps with the set of variables examined by Aspinall (2007), who performed a cluster analysis to identify subgroups within a sample of visitors to woodlands.

Our use of text in presenting the different parks was in line with our use of choice-based conjoint analysis, a method that enables examination of preferences for various attributes and levels of attributes that define alternatives. In this study the attributes are the different park components. There are three primary methods or types of conjoint analysis: conjoint value analysis, adaptive conjoint analysis and choice-based conjoint analysis (Orme, 2009). We adopted choice-based conjoint (CBC) with a full profile set up as recommended when the alternatives have six or fewer attributes (Orme and King, 1998; Orme, 2009). With a full profile set up, each park component of interest is presented at some level in a given park alternative. The levels used are realistic descriptions of the possible variation in the attribute (e.g., many trees, a few trees or no trees).

Conjoint analysis has mainly been used in marketing research in the development of new products (Orme, 2009). In our case, the park is the “product”, elaborated in terms of different park components. Respondents were presented with pairs of park alternatives which differed in the levels of different components. Given a pair of alternatives, each with six components at different levels, the respondent’s task was to choose the alternative that was best for him or her. In the present study, the matter of what is best was framed in terms of the possibility for needed restoration. The method provides a set up that reminds respondents of real world choices; it creates a realistic choice situation to which respondents can relate and in which they can make trade-offs.

Utilities represent the degree of worth or preference assigned by an individual to the different levels of the park components. These utility values cannot themselves be compared across components, but they can be used to calculate the relative importance of different components. Relative importances represent the ‘weight’ or the maximum influence park components may have on the choice of parks, bearing in mind the levels of the components. The significance of such a measure lies in the fact that it is ratio-scaled and sums to zero; that is, a component with an importance of 20% is as twice important as a component with an importance of 10% with regard to how the respondents made their choices given the set of components under study. This has practical implications as it suggests that meaningful comparisons can be made in terms of the potential influence of the park components within a study. Such comparisons can inform practitioners’ decisions on where to focus attention in order to enhance the potential restorative experience of a park or to attract different segments of people (e.g., a particular age group).

In sum, the aim of the present study was to assess the relative importance of specific components in Scandinavian pocket parks using conjoint methodology. Via a web-based questionnaire, residents of Oslo were presented with brief texts that described different combinations of physical components in a pocket park. The components under study were grass, bushes, trees, flower beds, water features, and the number of other people in the park.

**Method**

A web-based questionnaire was constructed using Sawtooth Software SSI Web version 6.4.4. With the web-based set up, respondents could log on to the survey from any computer with a web connection.

**The park components**

Choices regarding components and levels of components are of great importance in conjoint studies. Small differences between levels can affect the calculation of utilities and in turn the determination of the relative importances assigned to the different components. As mentioned previously, our choice of components for the alternatives (grass, bushes, trees, flower beds, water features, and the number of other people in the park) was based on the findings from Nordh et al. (2009, 2010). The levels of each component, except for water and flowers, were none, a few, and many (e.g., no trees, a few trees, many trees). These three levels give clear and separable distinctions between the park alternatives. The levels for water features were no water, mirror pond, and small fountain. Flowers had only two levels, flowers and no flowers (see Fig. 1). All of the components except for other people can be used by a landscape architect when designing small urban parks. They also commonly appear in Scandinavian parks. The variable “other people” was in Nordh et al. (2009) found to have a weak bivariate association with restoration likelihood. However, in subsequent work with eye-tracking methodology, Nordh et al. (2010) found that the presence of people in a park image attracted visual attention. This result and the assumption that the presence of other people can influence the possibility for restoration (Ulrich et al., 1991; Staats and Hartig, 2004) led us to include this component in our study.
Flowers used by Nordh et al. (2009, 2010): the respondents were presented with a scenario similar to the one part of the questionnaire. To set the stage for the choice tasks, exceeded to the series of choice tasks that comprised the greater midday and you are walking alone in a large town like Oslo. You are mentally tired from intense concentration at work and are looking for somewhere to sit down and rest for a little while.” Following the scenario, the respondents were given a pair of alternatives, and their task was to choose the one that was best for them. In the present study, the matter of what would be “best” was framed in terms of the possibility for restoration under the conditions presented in the scenario. The respondents were to take into account all six park components when choosing between the two alternatives with regard to their suitability for restoration. The respondents were told to assume that all other features except for the ones presented were the same across the two alternatives. Each park component was positioned at the same place in the list of components, starting with trees and ending with people. This was done to maintain consistency across successive choice tasks, thereby making it easier to complete the task (see the example in Fig. 2). It was a forced choice task; the respondents had to choose one of the two alternatives. This set up is in line with the assumption that in an everyday situation a person who is tired and looking for a park to sit down in will not walk on in search of the best alternative. Our use of the fatigue scenario and our reliance on respondents’ ability to imagine familiar environments or types of environments has ample precedent in environment-behavior research generally and research on restorative environments more specifically (e.g., Korpela and Hartig, 1996; Staats et al., 2003; Scopelliti and Giuliani, 2004).

Framing the choice tasks

After some initial background questions, respondents proceeded to the series of choice tasks that comprised the greater part of the questionnaire. To set the stage for the choice tasks, the respondents were presented with a scenario similar to the one used by Nordh et al. (2009, 2010): “Imagine that it is summer and midday and you are walking alone in a large town like Oslo. You are mentally tired from intense concentration at work and are looking for somewhere to sit down and rest for a little while.” Following the scenario, the respondents were given a pair of alternatives, and their task was to choose the one that was best for them. In the present study, the matter of what would be “best” was framed in terms of the possibility for restoration under the conditions presented in the scenario. The respondents were to take into account all six park components when choosing between the two alternatives with regard to their suitability for restoration. The respondents were told to assume that all other features except for the ones presented were the same across the two alternatives. Each park component was positioned at the same place in the list of components, starting with trees and ending with people. This was done to maintain consistency across successive choice tasks, thereby making it easier to complete the task (see the example in Fig. 2). It was a forced choice task; the respondents had to choose one of the two alternatives. This set up is in line with the assumption that in an everyday situation a person who is tired and looking for a park to sit down in will not walk on in search of the best alternative. Our use of the fatigue scenario and our reliance on respondents’ ability to imagine familiar environments or types of environments has ample precedent in environment-behavior research generally and research on restorative environments more specifically (e.g., Korpela and Hartig, 1996; Staats et al., 2003; Scopelliti and Giuliani, 2004).

Checks on questionnaire design

Three test design procedures were used in creating the choice questionnaire: frequencies, ordinary least squares (OLS) efficiency and logit report of simulated data. The frequencies procedure counts the number of times each level of a component is presented, looking across all of the alternatives used in the choice tasks in the study. The aim here was to balance the number of times each level within each component occurred. For example, we wanted “No trees”, “Few trees” and “Many trees” to appear the same number of times across the choice tasks. In our study design we used 20 versions of the questionnaires. The versions differed in terms of the orders in which the different choice tasks were presented. Each of the 15 choice tasks included two park alternatives, and each park alternative had six components. We set up the choice task so that levels within each attribute appeared an equal number of times across the study. This was the case for all three-level attributes and the one two-level attribute (i.e., flowers). Hence, our design was optimally balanced. This is particularly important to ensure that more frequent choice of a level of an attribute is not simply a matter of the frequency with which it is presented.

The OLS efficiency procedure estimates the relative standard error of main effects in each level using an ordinal least squares method based on the number of choices made (in the present case 15 per person) and compares it to what the standard error would be if the design were optimal (i.e., a hypothetical orthogonal design). As a rule of thumb, the closer the median of the OLS efficiency across all levels to 1.0, the better the design (1.0 is the maximum hypothetical value that OLS efficiency can get) (Orme, 2007a). With our study set up, the efficiency in all levels, in all attributes, exceeded 0.99.

Frequencies and OLS efficiency tests are based on the number of questionnaire versions, number of choice tasks and number of components. In contrast, the logit report of simulated data takes into account the number of respondents. Simulated answers are produced for a specified number of respondents and the standard error in utility estimation is calculated and reported for each level. According to Orme (2007b), a sample size that achieves standard errors lower than 0.05 is acceptable.

To check that the respondents were paying attention to the choice task, one hold-out profile was included. A hold-out profile (also called a fixed-choice or brain dead choice task) is a choice task with one alternative that is definitely more likely to be chosen over the other. The design of the hold-out profile was built on the knowledge about the importance of the different components gained from the previous research (Nordh et al., 2009) (see Fig. 3). The hold-out profile was presented halfway through the set of 15 choice tasks. Respondents marking the “wrong” alternative in the hold-out profile were excluded from the study.

Choice-based conjoint analysis (CBC)

We analyzed the choice data using a multinomial logit analysis method that provides estimates of ‘utility’ for each level of each component. To measure how many times each level of each component was selected, relative to the number of times it appeared across all choice tasks, we performed count analysis using SMRT software version 4.18 (Orme, 2009).

To determine which levels of components were most important to people, average utility values were calculated from the individual utility data gained from hierarchical Bayes (HB) estimation performed by Sawtooth’s CHC/HB software. Utilities represent the degree of worth or preference assigned to a particular level of a park component.

To determine which components were most important, it is also necessary to use individual utility data. However, utility values cannot be compared across components because they have different metrics; each component has a unique scale determined through the hierarchical Bayes estimation procedure on the basis of the obtained choice data. However, the difference in individual utility between the most and least preferred levels of a component can be used to represent the importance of each component for each respondent (Orme, 2009). These individual importances can in turn be used to determine the individual relative importance
of each component, which is based on the difference between the highest and lowest utility for the given component divided by the sum of differences across all components for that respondent. This quotient is multiplied by 100 so that the individual relative importances can be expressed as a percentage of the overall importance assigned to the different components across the choice tasks. Going further, to determine which components were most important, the individual relative importances can be used to calculate the average relative importance of each component. The average importances were calculated with SMRT software.

We also analyzed the preferences of different groups of respondents. A segmentation analysis was conducted with respect to age, gender, earlier involvement with parks or natural environments through studies or work, and frequency of park visits. Nonparametric independent samples tests were used to check group differences.

**Background questions**

Following a brief introduction to the questionnaire, but before the choice tasks, respondents were asked about their age and gender. Three additional background questions were used to check on respondent characteristics relevant to the interpretation of results. These questions concerned prior experience with urban parks as settings for restoration: “How often during the warm months of the year do you visit small urban parks?” (1 = never, 2 = a few times during the season, 3 = at least once a month, 4 = at least once every week, 5 = many times a week); “How important is it to you to relax, clear your mind and reduce stress when you visit a small urban park?” (0 = not at all; 10 = very much); “In your own experience, how well does spending time in a small urban park actually help you to relax, clear your mind and reduce stress?” (0 = not at all; 10 = very much). These latter two questions were recoded from 0–10 to 1–11 for analyses.

At the end of the questionnaire, respondents were asked to rate how easy they had found it to imagine the scenario and how easy they found it to imagine the different parks on the basis of the presented features (0 = very easy; 10 = very difficult; recoded to 1–11 for analyses). We also opened up for comments on the procedure as a whole.
Fig. 4. Average utility values for each level, calculated across respondents for each of the six components. The utility values are scaled to sum to zero. A negative value does not necessarily mean that the given level is disliked; however, in a choice situation in which all other components are equal, the alternative that includes the level with the highest positive utility will be preferred over the alternative with the lowest utility. The p-values refer to the differences between adjacent levels of the given component.

Respondents and procedure

We recruited respondents with an advertisement in a magazine distributed by Oslo Bolig-og Sparelag (OBOS), one of the largest property organisations in Oslo. The magazine is sent out to 220,000 households, all members of OBOS, of which approximately 95% are located in Oslo. We also advertised on OBOS’ external and internal web pages. Residents in OBOS’ Oslo housing experience the urban environment on a daily basis. We assumed that they would be able to imagine the scenario used to frame the choice task (i.e., being on a walk in a large town like Oslo, looking for somewhere to sit down and rest for a little while), and that they would be familiar with the type of small urban parks and open spaces in focus. A total of 206 respondents entered the web-survey, but only 164 completed it (79.6% completion rate). Nine indicated that they did not reside in Oslo and were excluded from the study. One respondent chose the wrong alternative on the hold-out question and was also excluded from the analysis. Altogether, then, we had 154 useable surveys. Recall that the efficiency procedure used to develop the questionnaire has a criterion of a standard error in the levels’ utility estimation of <0.05 and that this is dependent on the number of respondents. With the present sample size we had a maximum standard error of 0.034.

It took respondents on average 11 min (minimum 3.3 min, maximum 89.58 min, median 8.5 min) to complete the questionnaire, including background questions and choice tasks. This median value is not excessive with regard to the cognitive demands typically imposed by the choice tasks (Johnson and Orme, 1996). The maximum time taken for completion most likely reflects the fact that the respondents had the possibility of taking a break while completing the questionnaire.

About 90% of the respondents had lived in Oslo more than 5 years. Their mean age was 43 years (SD = 12.9, range 19–75). More than two-thirds (67.5%) were women. Almost all (98%) reported being Norwegian. About 22% of the respondents reported having some kind of earlier experience through work or studies with parks, gardens or other kinds of natural environments.

For the segmentation analysis the sample was broken into categories as follows: for age, less than 29 years (n = 18), 30–59 (n = 115), 60 or more (n = 21); for gender, man (n = 50), woman (n = 104); for earlier work or studies concerning parks and nature, yes (n = 34), no (n = 120); and for park visits, never, a few times every season, at least once a month (n = 60), at least once a week (n = 47), and many times a week (n = 47).

Results

Checks on the respondents’ use of parks and imaginability of the scenario

The respondents were frequent park visitors. Some 61% reported visiting parks more than once a week, and only two respondents reported that they never visited parks. The respondents generally considered it very important to them to relax, clear the mind and reduce stress when visiting a small urban park (M = 8.5, SD = 2.4). The respondents also reported that park visits actually helped them to restore (M = 8.4, SD = 2.2). The responses to the checks on the scenario tell us that our respondents found it relatively easy to imagine being tired and in need of restoration (M = 4.2, SD = 2.7). They also found it not very difficult to imagine the different parks on the basis of the presented components (M = 5.9, SD = 2.4). However, in the response to the open-ended question on the procedure as a whole, four respondents mentioned that they found it difficult to imagine the parks on the basis of the components. Three respondents mentioned that they found the choice tasks to be fatiguing.

Importance of the component levels

We performed a count analysis to determine the number of times each level of each component was selected, relative to the number of times it appeared across all of the choice tasks. For each component we found that the different levels were selected with distinctly different frequencies (all ps < 0.01). This indicates that the component levels that we used did capture meaningful distinctions for our respondents.
Fig. 5. Average importances for the six park components. As presented in the figure, grass is the most important component, followed by trees and people. In the choice situation the respondents put the least emphasis on bushes. All components sum to 100%, which reflects the whole park alternative. The $p$-values refer to the differences in average importances between adjacent components.

Analysis of the average utility values showed that many trees, many bushes, all grass cover, flower beds, a small fountain, and a few other people were preferred over the other levels for their respective components (see Fig. 4).

Relative importance of the components

The average importances of the components, based on individual utility calculations, show that grass was the most important component in making choices among the park alternatives, accounting for more than 20% of the overall importances. Grass was closely followed by trees and other people (see Fig. 5).

The omnibus Friedman non-parametric test, comparable to a repeated measures analysis of variance, showed that the relative importances differed across components, $\chi^2 (df=5, N=154)=93.13, p<0.001$. Wilcoxon matched-pairs tests showed that people were assigned higher average importance value than the water features ($p=0.03$). Water features in turn were assigned slightly higher values than flowers, but the difference was not significant at the conventional criterion ($p=0.06$). The difference between bushes and flowers was not significant ($p=0.14$).

Segmentation analysis

Non-parametric tests were used to determined whether importances differed among respondents grouped according to age, gender, earlier involvement in parks or nature through work or studies, and frequency of park visits. We found that people who visited parks frequently had similar importance values to those who visited parks infrequently (all $p$s > 0.1).

Regarding people with earlier involvement in parks or nature, we found that those with professional experience preferred trees and water features more than those without experience (for trees, earlier experience mean rank = 93.0 and no earlier experience mean rank = 73.1, $p=0.02$; for water features, earlier experience mean rank = 92.0 and no earlier experience mean rank = 73.4, $p=0.03$). In contrast, those with no experience gave higher importance values to other people more than those with experience (earlier experience mean rank = 56.5; no earlier experience mean rank = 83.4, $p=0.002$) (see Fig. 6).

We found significant differences between age groups in terms of their preference for flowers ($p<0.05$) and water ($p<0.05$). The data suggest that the older the respondent is, the greater the importance of flowers (>60 mean rank = 99.2; 30–59 mean rank = 75.6; <29 mean rank = 64.6) (see Fig. 7). The same trend was found for water (>60 mean rank = 98.5; 30–59 mean rank = 76.4; <29 mean rank = 60.1). However, note that the levels for water (no water, water fountain, mirror pond) differ from those for the other components.

When looking at preferences segmented by gender, we found that flowers were significantly more important to women than to men (women mean rank = 82.5; men mean rank = 67.2, $p<0.05$) (see Fig. 8).
Discussion

Results from the choice-based conjoint analysis tell us that grass, trees and other people were the components most influential in the choice of park alternative when looking for somewhere to rest. This is a result in line with earlier findings (Nordh et al., 2009). It is also a result that calls attention to the importance of vegetation in city planning, for which densification is the dominant trend. This result is potentially valuable from a planning perspective. Structural components, such as grass and trees, take more time to establish than decorative components, such as water and flowers, and so demand more planning.

When analyzing the average utility values, we found that many trees, many bushes, all grass cover, a small fountain, and flower beds had the highest utility values within their respective components. The linear relationships (e.g., the more trees, the higher the importance) were also found in the study by Nordh et al. (2009), in which the amount of trees, bushes, grass and flowers correlated positively with the likelihood of restoration rated for a sample of small urban parks in a sample of Scandinavian cities.

A variable that did not follow the same pattern as the rest of the components was the presence of other people. This variable had a U-shaped relationship with preference, where the middle alternative, a few people, was preferred above no people or many people. This may be due to the type of setting under study, in which the presence of a few other people can increase feelings of safety (cf. Staats and Hartig, 2004; Kirkebøen, 2010) but more than a few may in the small space cause feelings of crowding.

Regarding the water component, we did not find any significant difference in terms of preference for mirror pond or small fountain. However, the park alternatives with water were more preferred than the ones without. Water is a component that usually gives high scores on both preference and restorative quality (see for example Schroeder, 1982; Ulrich et al., 1991; Korpela et al., 2001; Purcell et al., 2001; Laumann et al., 2003; Berto, 2005; Regan and Horn, 2005). However, water is more often represented by natural water, such as lakes, the sea, and rivers, and relatively little is known about urban water features such as ponds and fountains (cf. White et al., 2010).

The components used represent rather broad categories and so allowed the respondents to think of their own trees, bushes, flowers and so forth. However, with our scenario we directed the participants to imagine being on a walk in Oslo during the summer, looking for a place to sit down, so one could expect that our respondents thought of vegetation and weather conditions that are common in Scandinavia. All of the people in our study were living in Oslo, and 98% reported being Norwegian, hence they were most likely to have similar frames of reference for the different components (e.g., what a tree looks like). The components were moreover very common, easily understandable, and not very difficult to imagine.

The choice of components is of great importance in conjoint analysis. An interview or focus group discussion is commonly done prior to the experiment to find relevant components and levels of components (e.g., Alalouch, 2009). Instead of going through such a procedure, we based our choice of components on the results of previous studies in the area (Nordh et al., 2009, 2010). All of the components used, with the exception of the presence of people, are environmental components that a landscape architect can design with when creating small urban park. They are also commonly existing components in Scandinavian small urban parks.

A component that we did not include in our study was the presence of benches. Using eye-tracking methods, Nordh et al. (2010) found that benches draw a lot of attention. Their subjects spent much time looking at the benches shown in the parks they studied. In the present study the respondents were given a scenario in which they were tired and looking for somewhere to sit down, so the presence of benches was implied. However, in the open-ended question six of the respondents commented on the importance of enough benches in small urban parks. It bears mentioning that one reason grass may have been preferred to such an extent in the present study is that it affords a place to sit down.

Using text instead of photos, we relied on the respondents’ capacity to imagine the parks on the basis of the presented components. The respondents reported that they had no great difficulty in imagining the different components; however, some mentioned that they experienced the choice tasks as rather fatiguing. The time for completion of the whole questionnaire including back ground and follow up questions was, however, relatively short.

Some readers may have the impression that we equate preference with restorative quality. That impression would be incorrect. Here we have considered how the possibility for restoration perceived with different park alternatives affected preference for those alternatives given a need for restoration. Thus, we have treated restoration need and the possibility of restoration as determinants of preferences (cf. Purcell et al., 2001; Staats et al., 2003; Hartig and Staats, 2006).

Conjoint methodology is a new and promising method which can contribute with valuable information applicable in practice. For example, the average importances for the different components suggest that it is better to put limited funds into grass before spending much money on flowers. The within-components differences in utility suggest that people would prefer increasing the amount of grass from none to some grass cover as compared to increasing the amount of bushes. However, one must be careful when making such claims. The results from a conjoint analysis depend of course on the number of components in the study and the presented combinations of components. There may be other components and levels that are important. Also, design is site specific, and encouraging the creation of parks that all look the same is not our intent here. The results simply give some valuable guidance on what residents of Oslo think is important in a small urban park. This information can be utilised in different ways by landscape designers in design decisions that take into account users’ preferences, and subsequently increase the likelihood of a park design with high restorative quality.

Of interest in this study was also whether preferences for park components were related to age, gender, earlier experience in studying or working with nature and parks, and frequency of park visits. However, we found relatively few differences between groups. This is in line with the results of Stamps (1999), who performed a meta-analysis of studies on environmental aesthetics. A concern raised by Sevenant and Antrop (2010) is that most studies within this field are based on responses from students. The present study is strong in the sense that it uses a sample of lay people living in an urban setting. However, results from the present study are in line with results from the study by Nordh et al. (2009), in which the subjects were students. The results are also in line with Stamps’ (1999) meta-analytic finding that students’ environmental preferences correlated strongly with the preferences of lay people. In any case, the results reflect Scandinavian possibilities and sensibilities; evaluation of components as with preferred activities in parks may differ as a function of variables such as climate and cultural context (cf. Lafortezza et al., 2009).

The use of a web-based questionnaire involves a variety of issues that may not be familiar for some researchers. One issue involves open versus closed access to the questionnaire. Closed access may work best with a sample selected for representativeness, but it requires the assignment of passwords. Every respondent would thus have had to send an email asking for a password to be able to open the survey. This extra step could have reduced the number of respondents, so we decided not to use passwords. There are, how-
ever, some limitations imposed when not using passwords. First, the participants cannot stop the questionnaire and continue from ever, some limitations imposed when not using passwords. First, the participants cannot stop the questionnaire and continue from

Acknowledgements
The authors wish to thank Oslo Bolig-og Sparelag (OBOS) for their generous help in recruiting participants for the study. We would also like to thank all of the respondents for taking the time to complete the questionnaire. We would further like to thank the members of the OPENSpace Research Centre, and particularly Peter Aspinall, for their willingness to communicate their knowledge of conjoint analysis. Finally, we thank the two anonymous reviewers for their helpful comments on an earlier version of this paper.

References

